

Modernizing US Milk Pricing: An Exploration

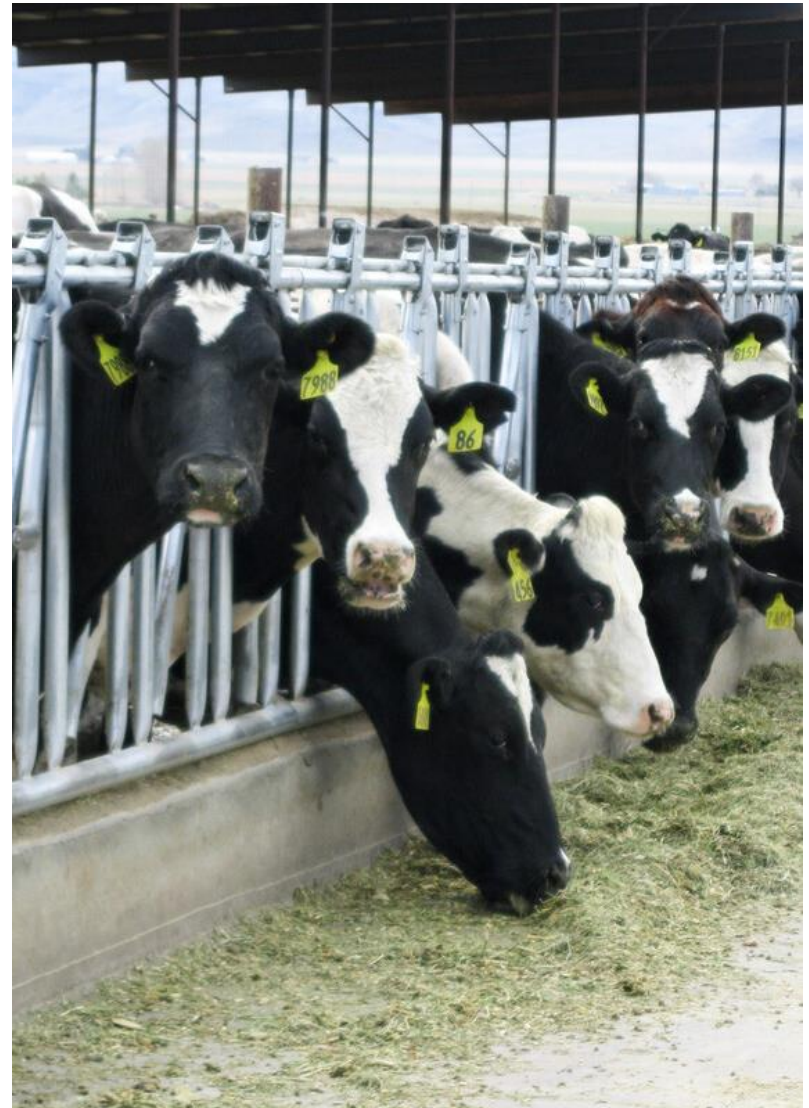
WORKING PAPER

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Introduction

As 2022 unfolds, the industry may find itself in Federal Order hearings and will certainly be preparing for the next Farm Bill. It's another chance to coalesce around major, meaningful reforms. With that in mind, the International Dairy Foods Association Economic Policy Committee asked Dr. Marin Bozic and the team at Blimling and Associates to put together a paper on milk pricing.

IDFA asked for an overview of prevailing realities, competitive issues and global pricing practices. The goal: provide a third-party assessment that spurs frank, creative discussion about the real pricing and policy issues requiring the industry's attention.

The authors traveled several avenues to assemble this report. We conducted interviews with dozens of industry stakeholders to identify trouble spots. We gathered and critically analyzed key data points. We reached out to dairy experts elsewhere in the world.

In the end, we've produced a report that spotlights three key areas. First, because so much of the system pivots around Class I milk, we offer a detailed discussion about the challenges in the fluid bottler space – some familiar, many new. Second, because many agree that increasing exports is critical for healthy US industry growth, we considered how pricing policy impacts global market competitiveness. Finally, we examine pricing structures in several countries to see if the US industry can find useful templates.

We've painted a lot of broad strokes on a big canvass. We hope our work gives the industry a real head start as it tries to develop a framework for upcoming reform opportunities.

Executive Summary

- Challenges in the Fluid Milk Space
 - Foundationally, US milk pricing regulation is premised on the assumption that pool draws are a sufficient incentive for dairy product manufacturers to supply Class I plants and participate in the system.
 - With fluid sales waning, and milk used for manufacturing increasing, if regulations are not modernized, the percentage of US milk covered under the current system will steadily decline over the next decade.
 - As long as the system bases access to marketing orders on serving beverage market, cooperatives have the incentive to capture a larger share of Class I differential dollars by selling milk at low markups to retailers, thus disincentivizing innovation, competition and new entrants.
 - Because the system redistributes revenue from all fluid milk to all pooled producers, processors have limited incentive to make major investments in new Class I products.
 - To properly align incentives for value creation and potentially enhance Class I margins, the industry may wish to explore pricing mechanisms that increase marginal revenue to innovating processors and reduce the need to sell fluid milk just to buy pool access.

Executive Summary

- Export Opportunities and Challenges
 - Share of US solids exported has been steadily rising, and now exceeds the share of solids used in beverage milk products. Trends in milk supply growth and domestic demand suggest more than half of all additional skim solids produced over the next decade will need to be exported.
 - Processors in the European Union and New Zealand, two main US competitors for global dairy markets, benefit from regulatory flexibility and incentives to optimize product mix for value creation.
 - As natural resource constraints and climate change policy measures curb further growth of milk supply in the EU and Oceania, the US once again has a window of opportunity to capture a larger share of world dairy trade.
 - Several processors interviewed for this project report that FMMO regulations create challenges in pursuing overseas sales, especially those requiring long-term fixed prices. If the industry wants to enhance export potential for all players without regard to geography or ownership structure, it may wish to consider regulatory or legislative changes that address the rigidity of current provisions.

Executive Summary

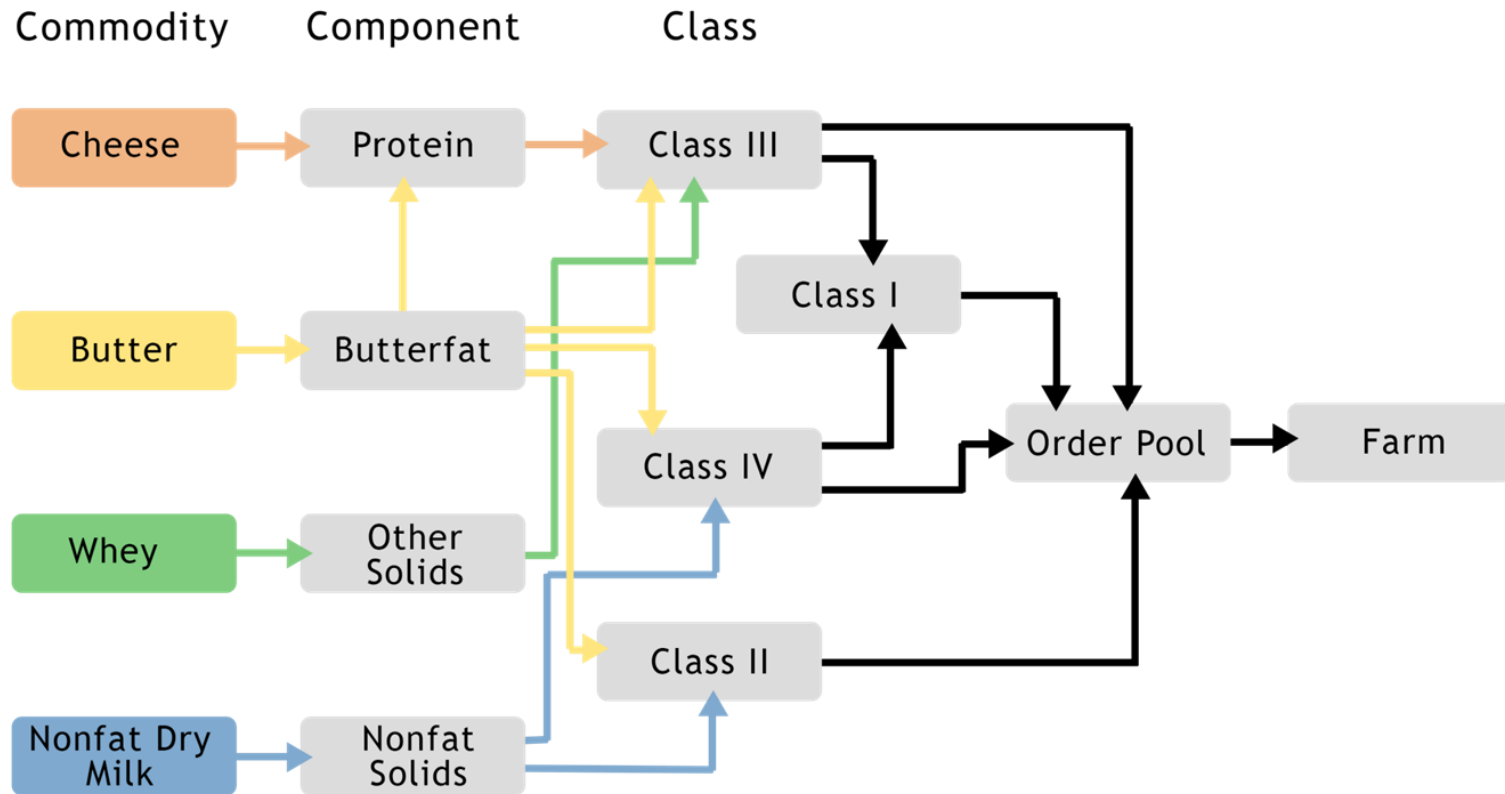
- Across countries we analyzed, we identified the following patterns in milk pricing regulation and industry norms:
 - All countries feature either existing regulation or efforts to implement regulation. The purpose of regulation is to balance negotiating power of dairy producers and milk buyers, typically in a carefully crafted way so as not to induce oversupply of milk, or reduce processors' ability to compete.
 - Products destined for domestic market are often at least partially insulated from monthly volatility in commodity markets. This is most frequently accomplished through using a slow-moving index, such as cost of milk production.
 - Exporters tend to base their pricing on value of milk in tradable commodities.
 - Governments and trade associations promote milk pricing transparency to fill voids created by the absence of public markets and regulated values. Transparency takes the form of publishing specific pricing schedules or methodology for determining prices. Increasing trend is toward processor-level transparency.
 - Among major exporters, the US is the only country that attempts to implement minimum price regulation. Elsewhere, the focus is on terms of trade (proscribing required and prohibited content of milk supply agreements), sustainability, and information services.

Why Regulation?

Why Regulation?

- To combat chaotic and disorderly markets for fluid milk, in the 1930s the US government established the Federal Milk Marketing Order (FMMO) system.
- A primary function of FMMO design was to lessen intense competition between dairy farmers for higher valued sales to fluid handlers. Those fluid handlers were leveraging the intense competition to lower overall milk price levels, challenging dairy farmers' financial viability.
- To this day, the FMMO tries to maintain “orderly marketing” by ensuring that regulated buyers of milk for similar uses pay roughly the same price while simultaneously guaranteeing all similarly located farmers in the pool receive homogeneous prices.
 - FMMOs accomplish this through the classified pricing system with buyers separated into one of four classes, with each category of use commanding its own minimum regulated price.
 - Prices can, however, vary significantly from class to class.
- For many years, the FMMOs operated in concert with comparatively high government “support price” levels that absorbed surplus dairy products at market clearing levels and dampened volatility in the process.
 - In other words, for decades, price supports shielded Federal Orders from market forces.

Why Regulation?



The FMMO system equalizes producer pay prices through a process of pooling the revenues from the four classes and paying the blended average value of those individual class prices to producers.

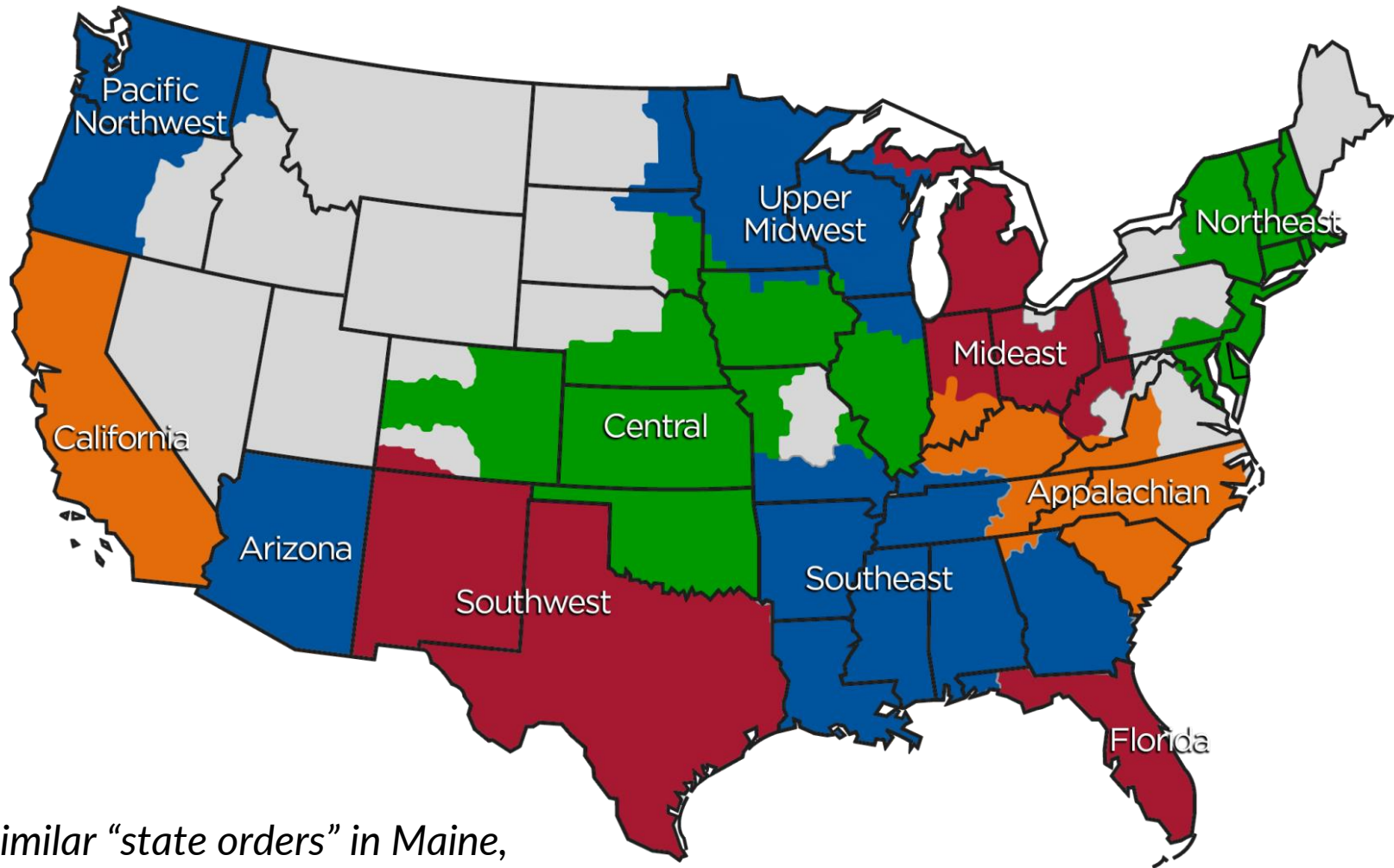
Why Regulation?



- Another stated objective of the FMMO system: guaranteeing an ample supply of fresh fluid milk to US fluid milk bottlers.
- While it is difficult to imagine the conditions under which fluid bottlers would not receive ample milk today, this was a genuine concern in the 1930s. Milk's perishability, primitive refrigeration and limited distribution technology combined to create real challenges to fluid milk bottlers that needed adequate supply bases within small geographic areas.
- The system incentivizes supplying milk to bottling plants in two main ways:
 - Attempting to guarantee that the price of Class I milk for bottling exceeds all other uses
 - Tying access to FMMO pools (and the revenue associated with participation) to making a portion of milk supply available to fluid bottlers.
 - This system has proven effective in making milk available to bottlers, though it has created some unintended challenges.



Why Regulation?

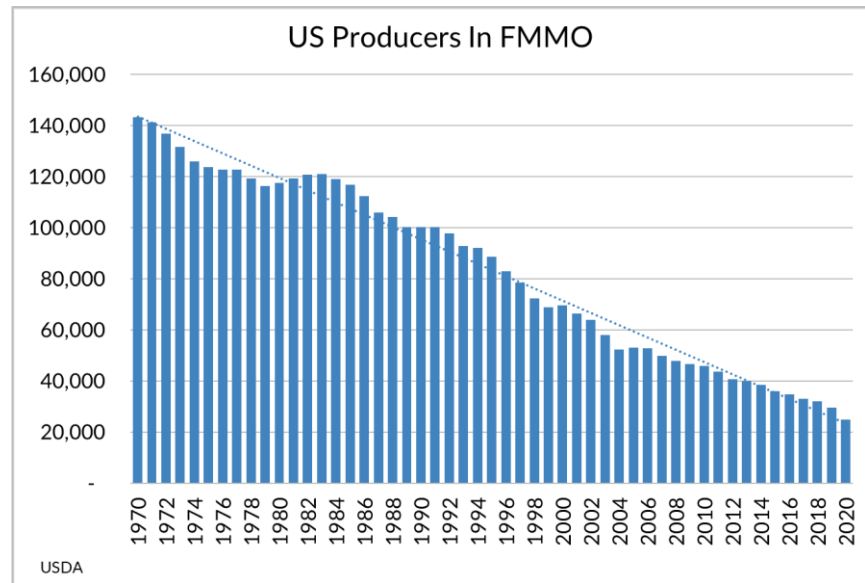
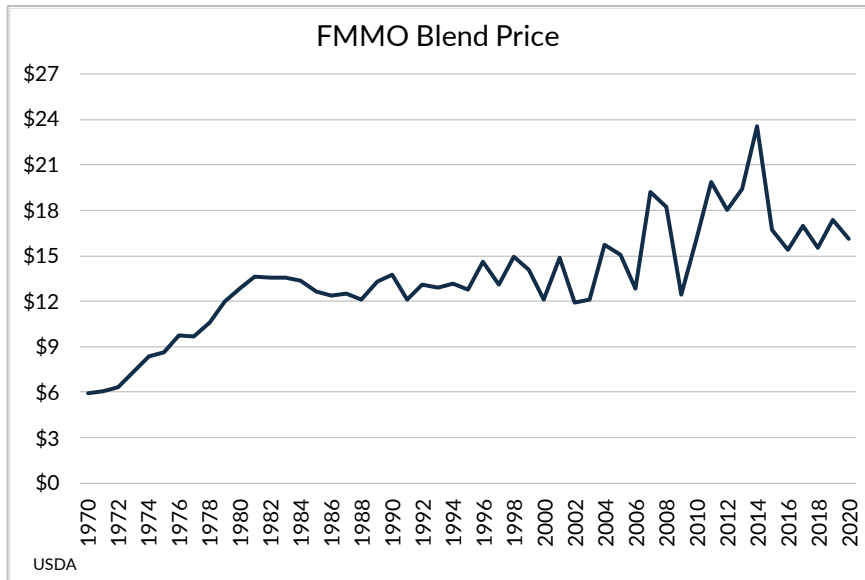


Similar “state orders” in Maine, Montana, and Pennsylvania

Regulation vs “Free Market”

- Using regulation to direct market reaction to changing conditions or setting different ingredient prices depending on use won't likely produce the same outcomes a free market.
 - But some FMMO features attempt to mimic free market outcomes.
- Product price formulas attempt to split the value of dairy commodities into the value contributed by farmers and the value contributed by manufacturers
- Make allowances provide that, for any given level of commodity price, lower cost manufacturers will be more profitable than higher cost manufacturers.
- Meanwhile, the classified pricing system seeks to guarantee producer participation in value-added markets by identifying and quantifying value.
 - The system says that producer milk used in Class II is \$0.70/cwt more valuable than if the same milk went to Class IV.
 - Class I differentials are a representation of how much value the system believes fluid use adds in each county in the US.

Regulation vs “Free Market”

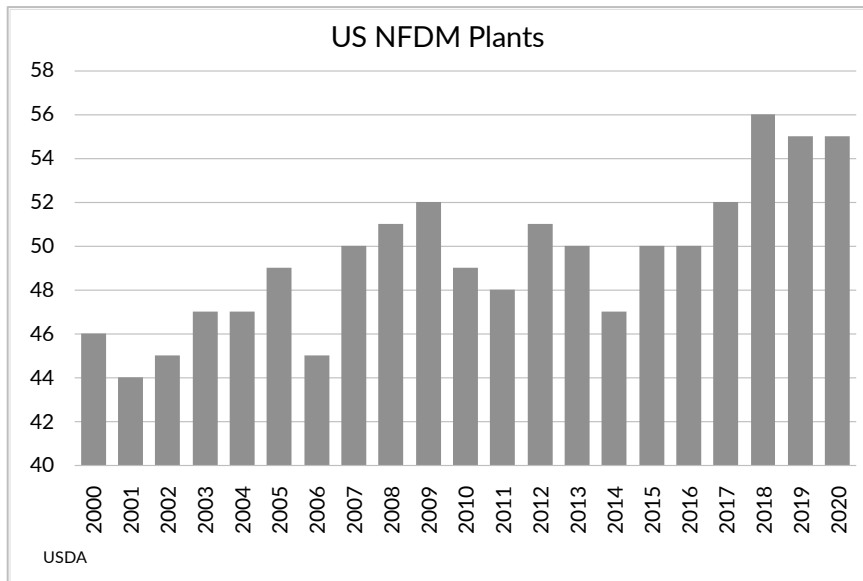
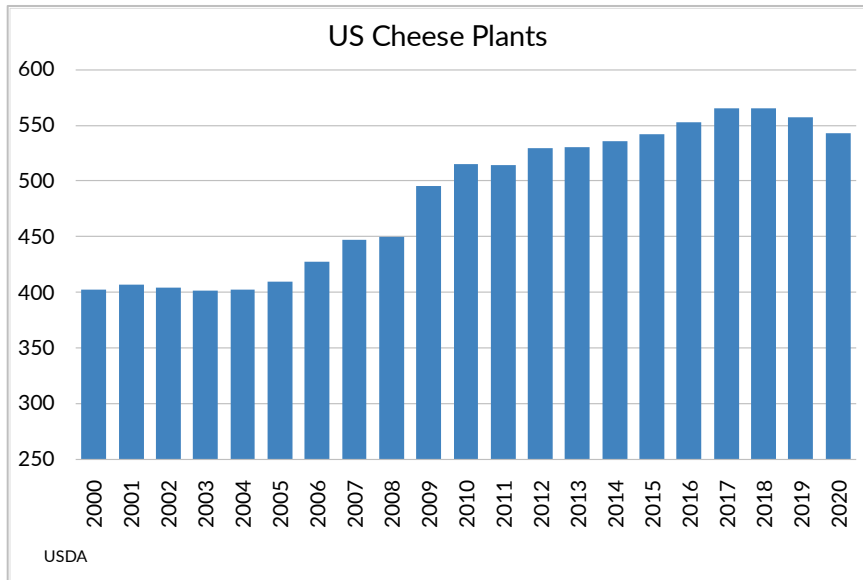


- While the FMMOs try to replicate the performance of a free market, the system clearly fails to one degree or another on all counts.
- Make allowances are constantly in question over their ability to reflect actual costs in anything close to real time.
- Do Class I location differentials that are 20+ years old still represent the value added by bottling at each location?
- Should a Class I market that has lost substantial share even be considered “value-added” at a time when cheese demand continues to grow at a rapid clip?
- Is \$0.70/cwt an accurate representation of the additional value of milk in yogurt, ice cream or dips versus butter/powder?

Regulation vs “Free Market”

- There are also examples where the FMMO system is openly hostile to free market outcomes.
 - Classified pricing discriminates on price by assigning differential costs for milk based on the products made.
 - A free market would establish one price for milk of like quality and manufacturers would buy more or less based on their ability to profitably convert that milk into dairy products.
- Free markets do a remarkable job of allocating resources to their highest value use.
 - Allowing resources to find their highest value use ensures maximum revenue available to reward the entire supply chain.
 - By taking revenue from manufacturers achieving higher returns and using those dollars to subsidize the production of lower value products, FMMOs change the risk/reward profile of alternative products, thus actively discouraging value-added production. In fact, by providing these subsidies, FMMOs encourage additional production of the least valuable products in the marketplace. Nonfat dry milk, for example.
 - This may be the biggest structural shortcoming of the FMMO system.

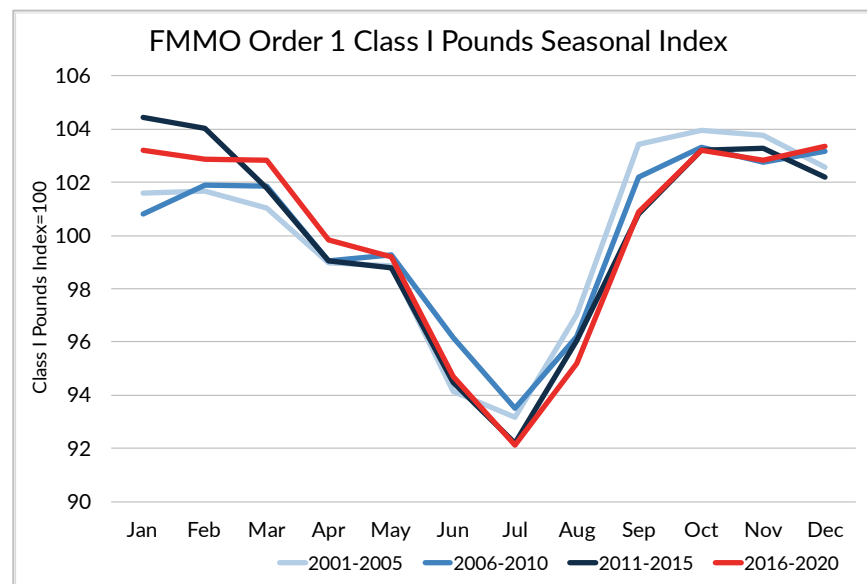
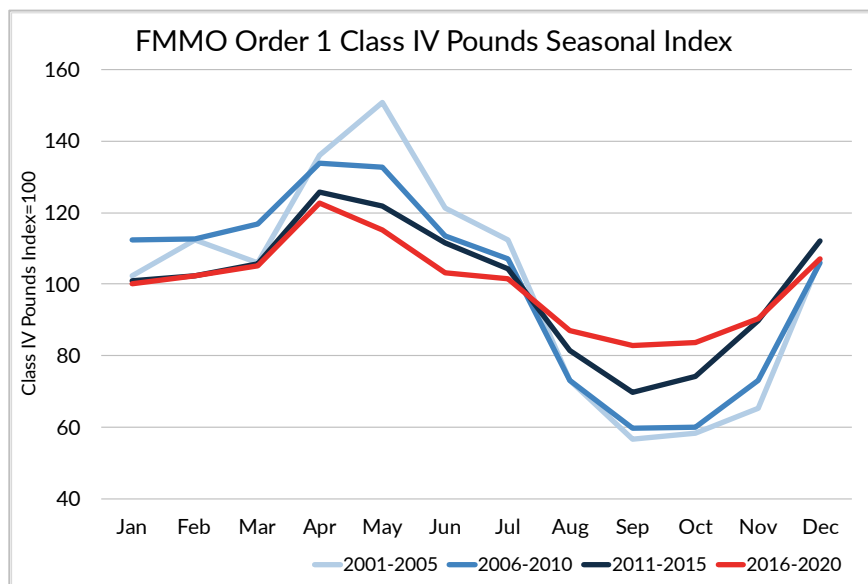
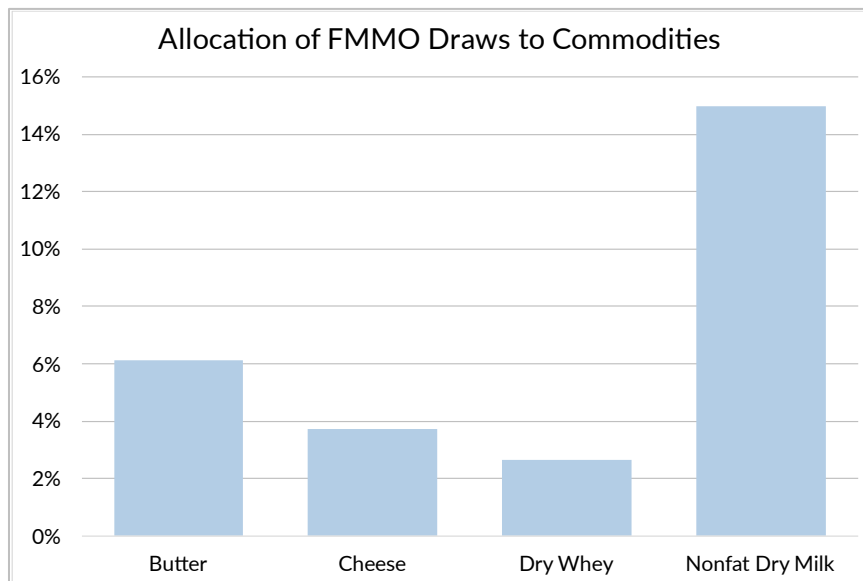
Regulation vs “Free Market”



- Product price formulas and make allowances tend to distort the backdrop against which market participants make decisions.
 - The US market features a lot of specialization. Many companies focus on making just cheese or just butter or just yogurt. Would US manufacturers be as specialized in an unregulated market where lower-value users weren't subsidized by value-added buyers through the pool? Or would cheese/whey or butter/powder manufacturers need to invest in higher valued products as well in order to compete effectively for farm milk?
 - Would the US produce as much milk powder as it currently does if it weren't subsidized through FMMO pools?
 - Would the product mix of cheese makers be different if cheddar prices weren't the basis for price regulation?
- Product price formulas and fixed make allowances shift the vast majority of commodity price risk to dairy producers.

FMMOs Subsidize Powder Output

- Classified pricing and revenue pooling have resulted in considerable subsidies to producers of butter and nonfat dry milk.
 - For example, allocating net draws from FO 1 to four basic commodities, we find that NFDM price was subsidized at 15% of market price, vs less than 4% for cheese.
- “Balancing” dynamics have changed. Over the past 20 years, Class IV products have become much less seasonal.

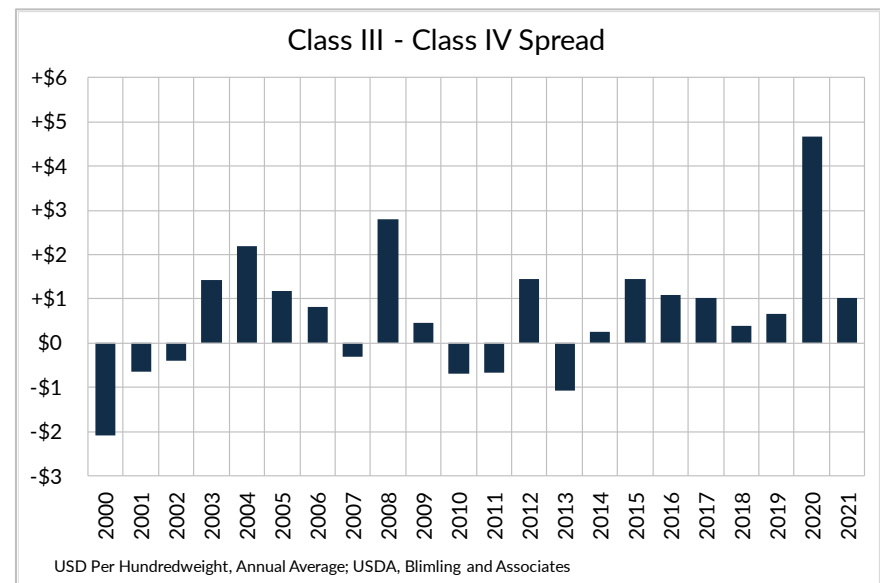
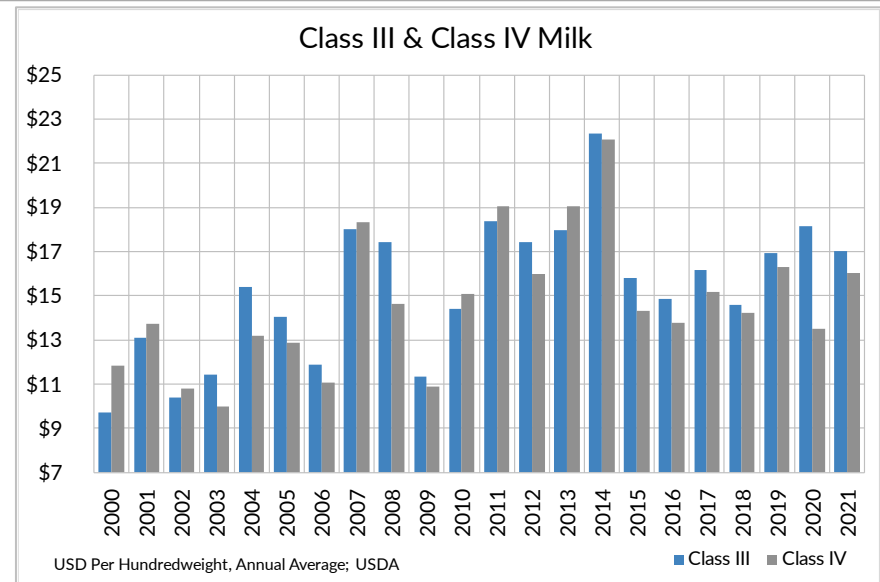


Regulation vs “Free Market”

- Several of the distortions created by the FMMOs have profound impact on decision making, market outcomes and even industry structure. Conversations with market participants identified several ways in which regulation altered decision-making.
 - Because product price formulas seek to equalize returns from manufacturing one hundredweight of milk into butter/powder and cheese/whey, there is powerful incentive to invest in less capital-intensive butter/powder plants.
 - Since pooled milk buyers can extract funds required to pay competitive market prices for producer milk, they can invest in and divert supply to lower value butter/powder production and still get all the farm supply they need.
 - Even when gaps between Class III and Class IV prices are wide, it can be difficult or impossible to get lower-value manufacturers to give up milk to the tighter market.
 - Buyers must ultimately pay the higher price to producers for any milk diverted from one class to the other. Consequently, it takes premium dollars to compensate manufacturers for giving up the milk regardless of the gap between class prices. This is especially true when attracting milk from large plants with high fixed costs.

Regulation vs “Free Market”

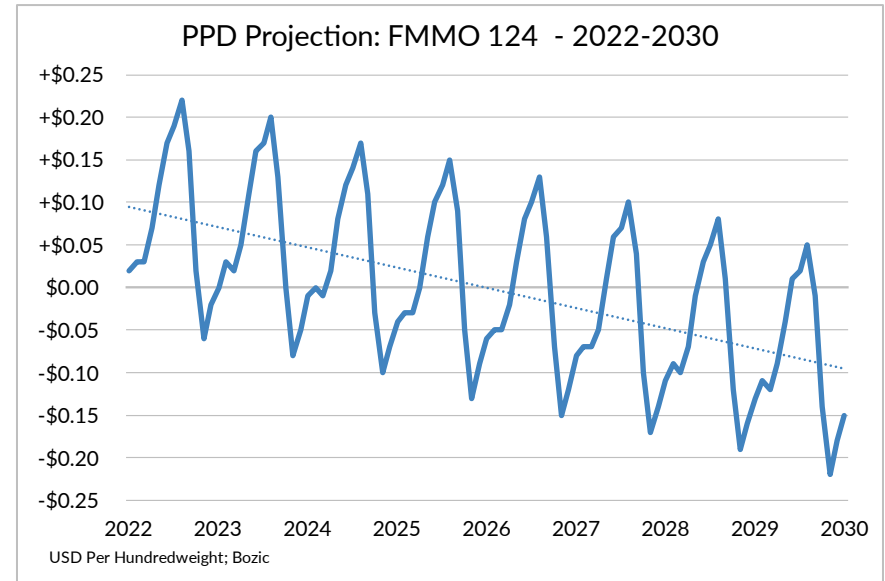
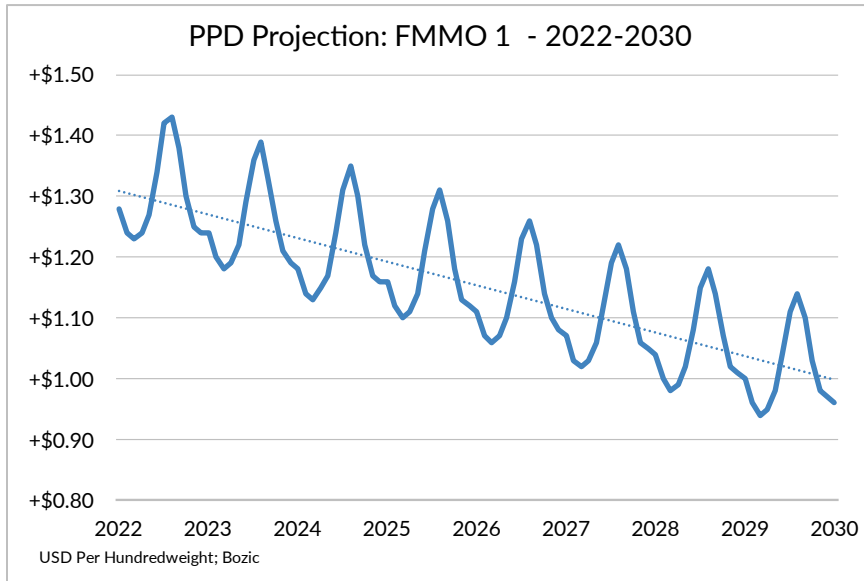
- Additional conversation notes on distortion and decision making:
 - Because make allowances in product price formulas are designed to reflect the average manufacturing cost of currently operational plants, margins are not sufficient to cover costs associated with greenfield expansions.
 - Consequently, new plants are only built when milk oversupply is severe enough that producers/cooperatives are willing to subsidize the operation through discounted supply and/or invest their own capital to build the necessary capacity.
 - While nothing in the prevailing regulatory structure prohibits investing in smaller or even value-added plants, the guaranteed profitability that comes with being large enough to keep actual production costs below the regulated make allowance alters the risk/reward trade-off — skewing decision making in favor of the guaranteed returns.



Regulation vs “Free Market”

- It may be reasonable to argue that, while FMMO price regulation creates many distortions, the system produces few actual impacts on competitiveness because all regulated entities are playing by the same set of rules.
- Interviewees quickly pierced this assertion, pointing out that:
 - FMMO regulations don't apply internationally so global competitiveness is clearly impacted.
 - A large – and increasing – share of dairy product manufacturing is taking place outside of the regulated pricing system. That's because large portions of the US are unregulated or because the benefits of participating in the regulated system are being diluted to the point where many choose to operate outside the system, taking their chances in being competitive in milk procurement.
 - Still others pointed out that, because USDA views cooperatives as extensions of producers (bypassing requirement to pay regulated minimums to members), they can also effectively operate as unregulated entities as it relates to milk prices.

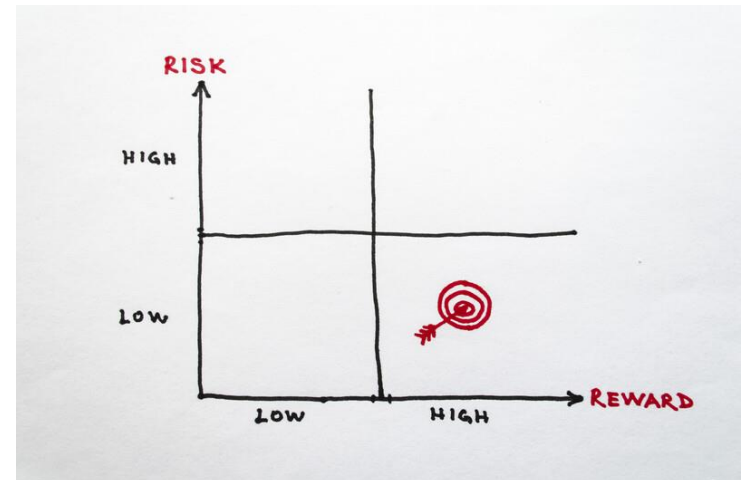
FMMO Benefits Trending Down



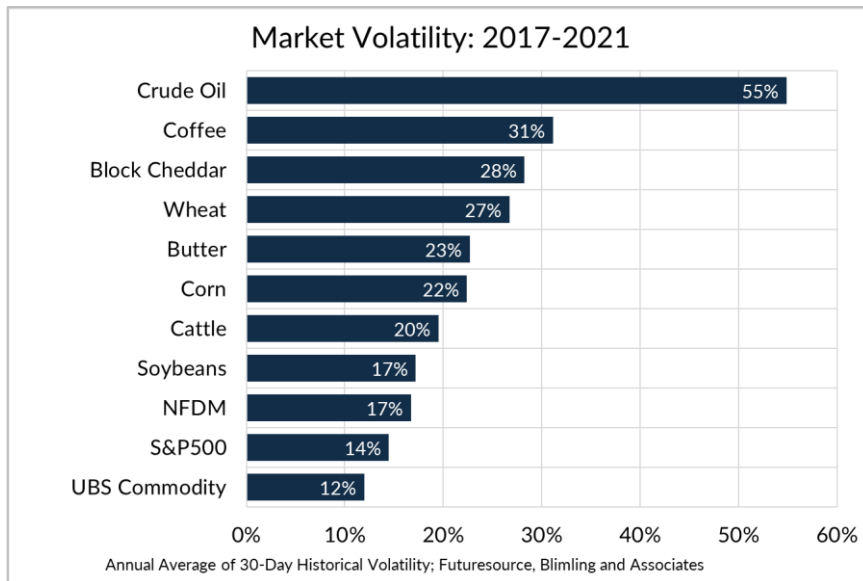
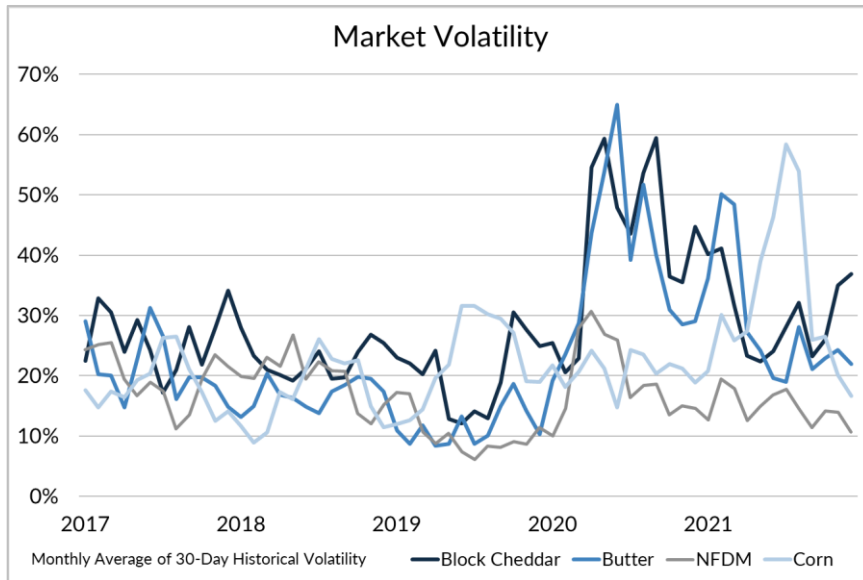
- Model suggests an additional 20% or greater decline in PPD value in Order 1 over the next eight years.
- PPD in Order 124 is forecasted to transition from a small positive PPD to regular seasonally negative producer price differentials.

Risk Sharing

- As mentioned elsewhere in this report, risk sharing is a key differentiation between the US dairy sector and the industry elsewhere in the world.
- The combination of product price formulas and fixed make allowances ultimately means that dairy producers shoulder most of the risk created by price volatility.
- A standard commodity cheese plant buys milk at prices tied by formula to product values and enjoys a predictable (if insufficient and outdated) margin in between. Meanwhile, dairy producers ride the monthly ups and downs.
- Elsewhere in the world, producers and processors share more of this risk.
- Commodity prices change at least monthly, if not weekly, in most of the world, while milk prices in Europe and New Zealand typically change only once or twice per year.
- It's tempting to view this as an advantage to US milk processors. But it is important to recognize that, as is almost always the case, rewards are commensurate with risks. In other words, dairy producers reap big rewards in periods of high commodity prices while dairy manufacturers see very little additional profit.



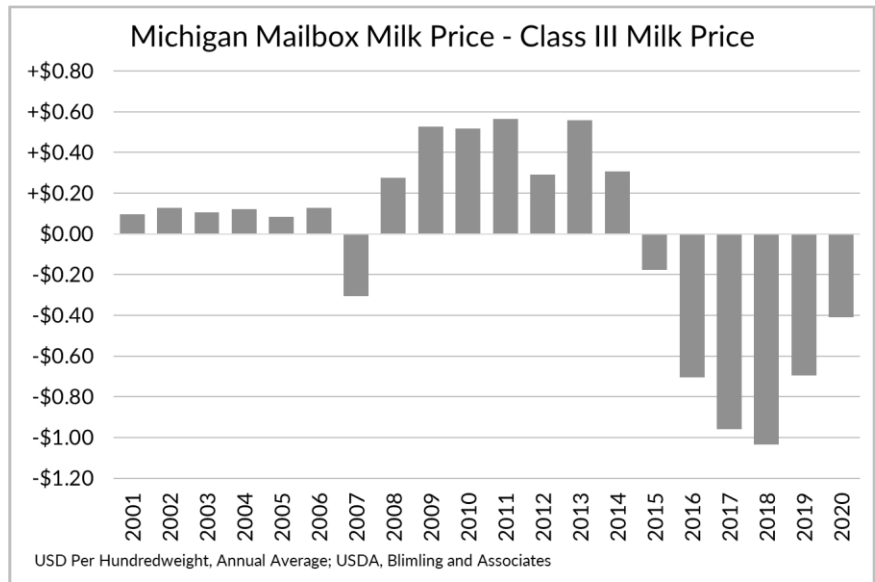
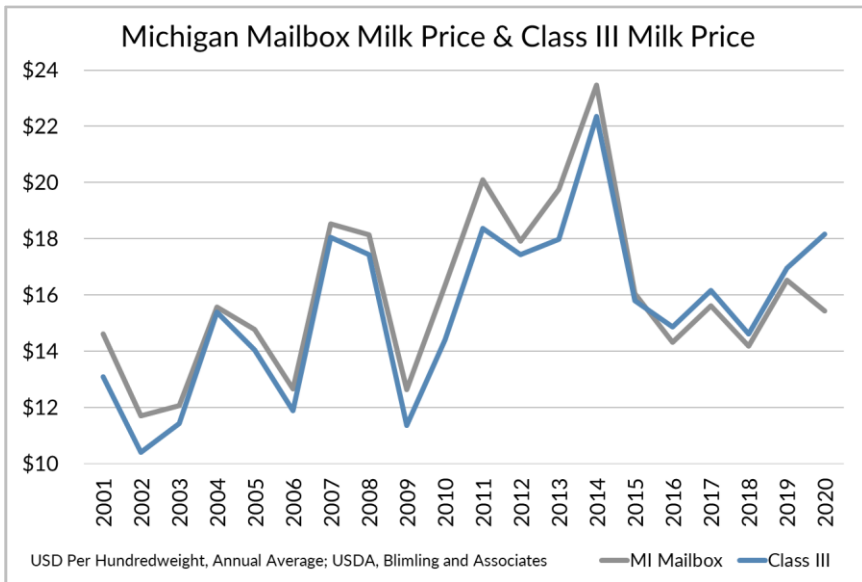
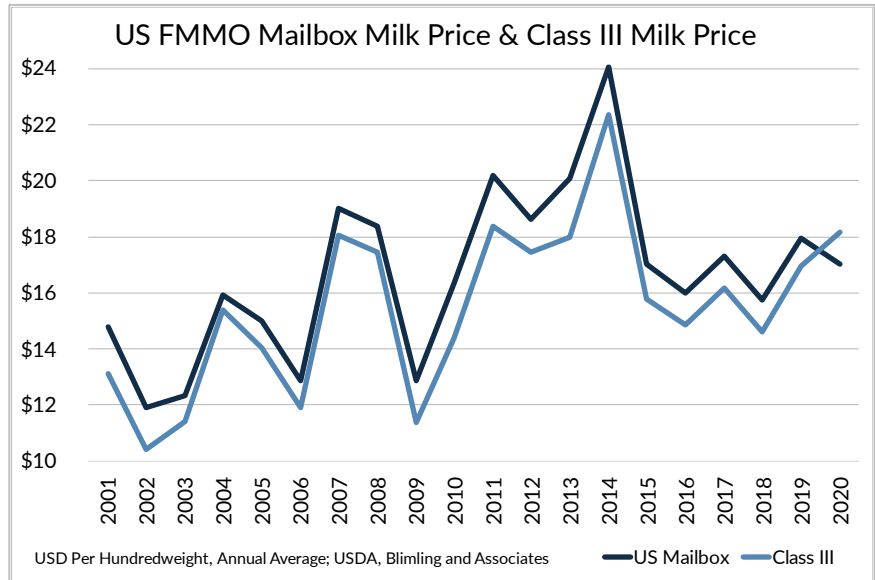
Risk Sharing



- The low risk/low reward reality for processors becomes problematic when high commodity prices lead to dramatic increases in milk production.
- Because processing plants don't enjoy dramatically better margins in elevated markets, they don't have additional incentive (or capital) to invest in new plants to clear additional volumes.
- So, how do you clear additional milk volumes in that environment?
 - In some cases, producers use their own capital to build new plants either through direct investment or through their cooperatives.
 - This investment is typically more about creating room for additional milk production than about generating manufacturing profits.
 - Consequently, dairy producers shoulder a lot of the risk of capital investment in manufacturing, along with the risks associated with month-to-month milk price movement.

Risk Sharing

- Producers bear some risks associated with plant investment even when private players are putting up the money.
- Most recently, in the Mideast, it took several years of regional oversupply and discounted milk to prompt investment in a new cheese plant. And even then, producers participated in the investment via supply arrangements at discounted prices in return for profit sharing.



Risk Sharing: Questions to Ponder

- As one of our interviewees pointed out, negative milk premiums can move milk as effectively as positive premiums. Does it really matter if regulated prices are relaxed, allowing the market to dictate pricing structure and level, thereby incentivizing non-cooperative market participants to deploy capital?
- Do outcomes really change if the burden is shifted to producers through lower regulated prices and positive premiums versus higher regulated prices and negative milk premiums?
 - Would such a shift incentivize more proactive plant construction? Or would it also require eliminating fixed margins and product price formulas, creating new risk/reward dynamics for processors as well as producers?
- After 20 years of coexisting with product price formulas and modest but consistently positive margins, would manufacturers entertain a more dynamic, market-oriented approach? Would producers willingly give up some of the larger but less consistent returns realized “on the farm” in exchange for more stability in pricing and returns?
- If the industry is comfortable with current dynamics, should it try to ensure alignment between elements of policy with risk management tools?

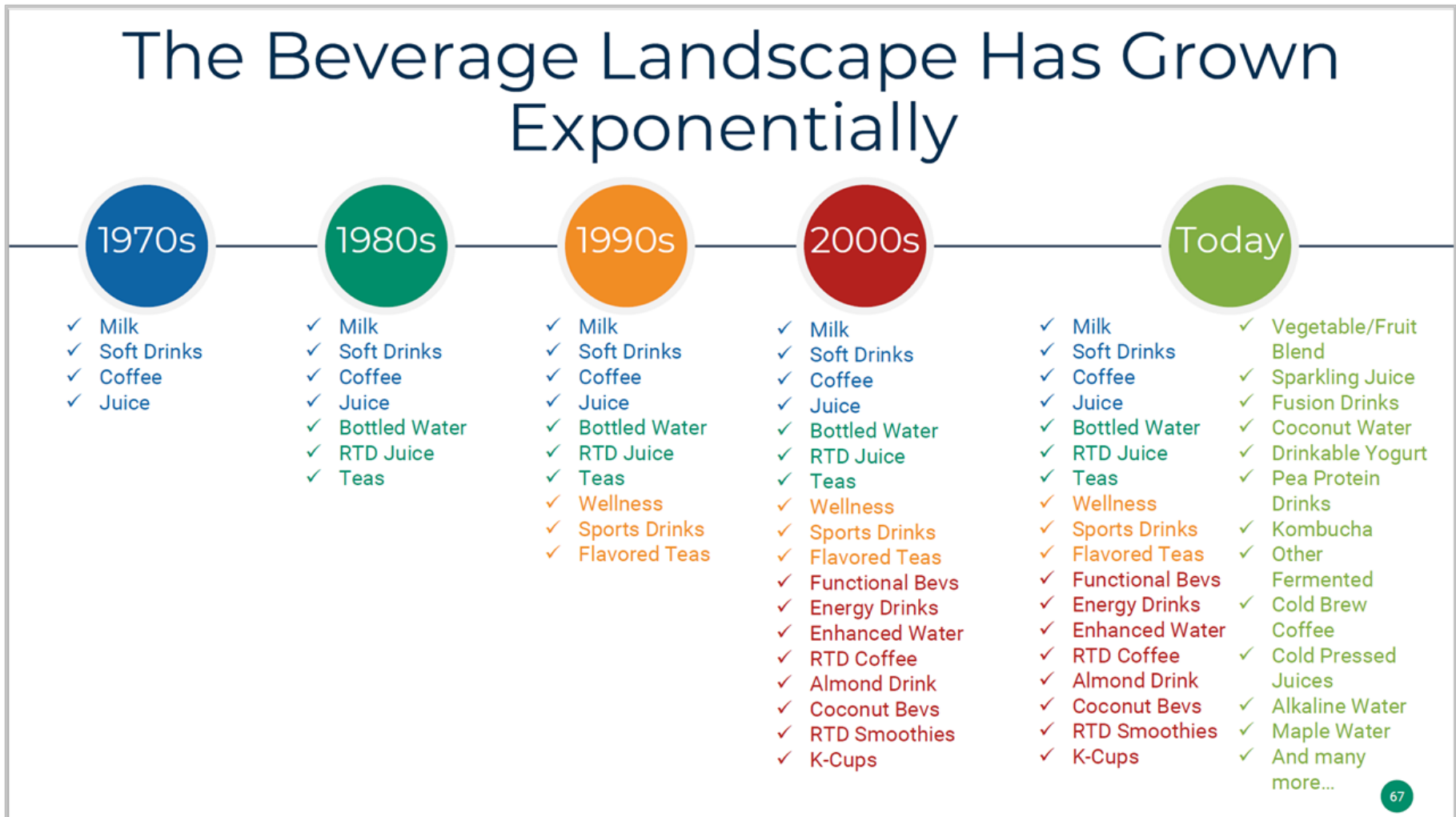
Class I Issues

Class I Market Issues

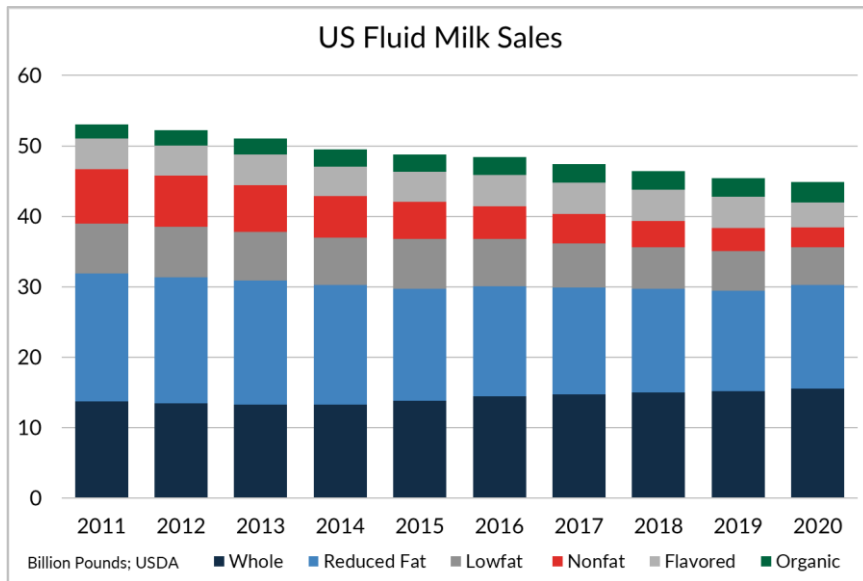
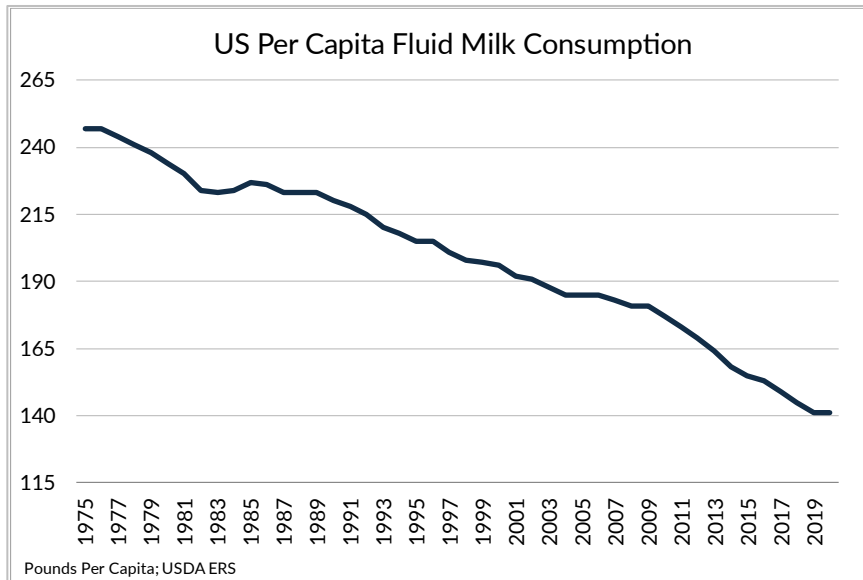
- The most common themes in fluid milk discussions: the persistent lack of margin in the fluid milk business and steadily declining sales.
- Generally, interviewees see a lack of innovation playing a role in eroding sales as competitors proliferated and fluid milk stagnated.
- Many contacts cited paltry margins as a primary reason for the lack of innovation.
 - There simply isn't enough profit in fluid milk bottling to reinvest in research and development or to support the marketing of new products.
 - Credible sources say it takes as much as \$150 million to introduce and support a new product for the retail marketplace
 - Consequently, most bottlers have chosen to either exit the business or to simply “play out the string” by avoiding reinvestment in the business or facilities and harvesting cash for as long as possible.
- Some have attempted to differentiate their business, typically by shifting to extended shelf life (ESL) products with a focus on lactose-free, organic, plant blends, etc. But investment in traditional fresh fluid milk has ground to a halt.

Class I Market Issues

The Beverage Landscape Has Grown Exponentially

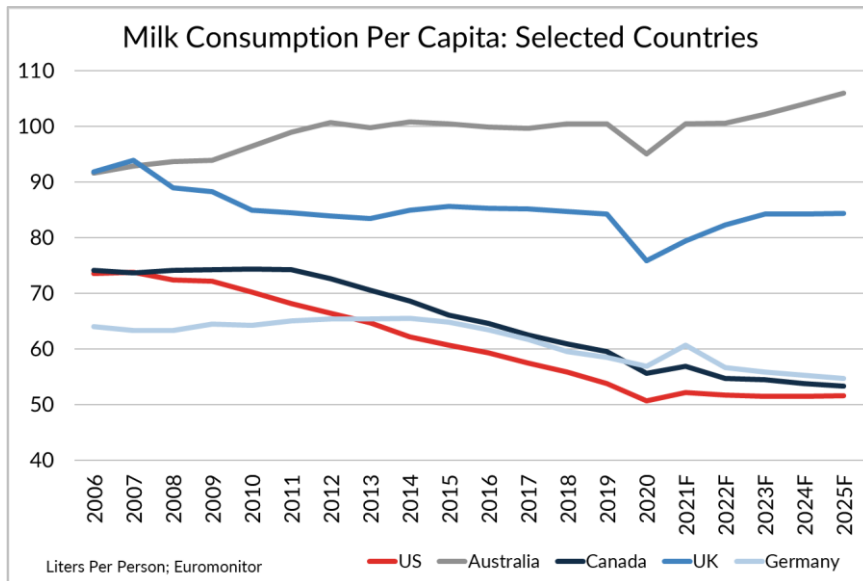
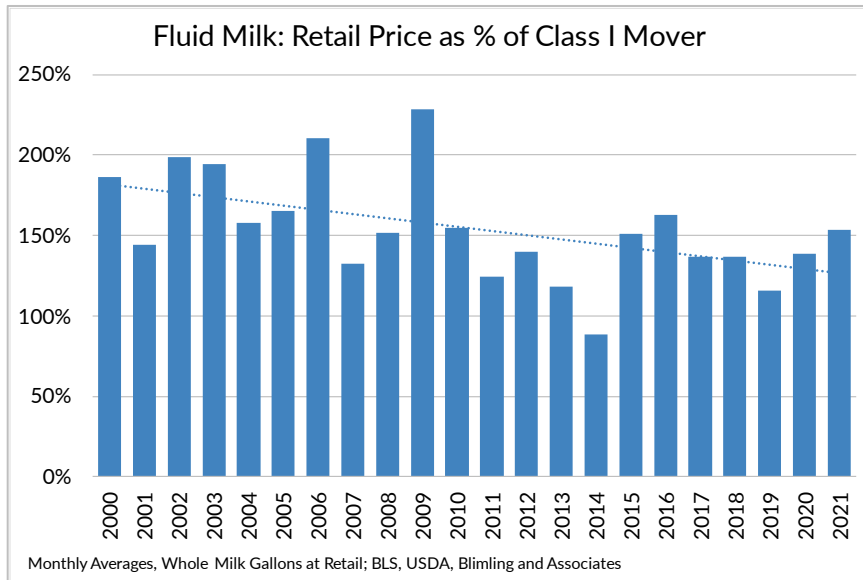


Class I Market Issues



- There is some sentiment that merely moving to ESL could breathe new life into fluid milk sales.
- Contacts base their optimism on research suggesting that, because of longer code dates, consumers view ESL milk as fresher and prefer it over traditional high-temperature-short-time (HTST) pasteurized product.
- That said, conversations with ESL marketers suggest that while consumers may view ESL as fresher, they are not readily willing to pay more for the product.
- This matters because ESL pasteurization and packaging costs are both significantly higher than those for traditional HTST.
- Contacts suggested some further degree of differentiation is required to improve the likelihood of success.

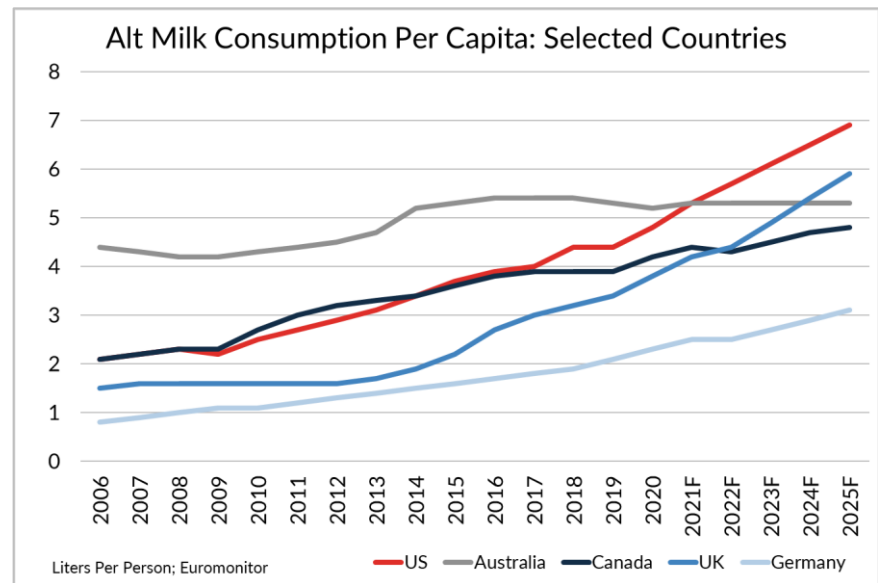
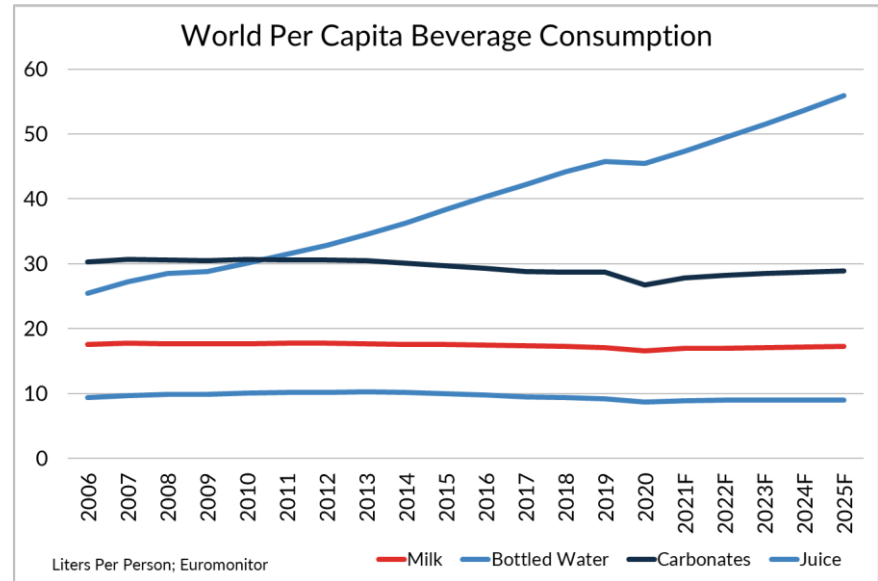
Why Are Class I Margins Meager?



- Discussions revealed several causes:
 - **Raw material cost transparency.** The regulated system provides everyone with a detailed view of milk costs into fluid milk plants.
 - **Intense competition fueled by ever-declining sales.** The industry still has too much capacity, a problem that continues to get worse, sparking even more competition for remaining volume.
 - **A vicious circle between innovation and margins.** A lack of innovation leads to declining sales and declining margins – only exacerbating the lack of innovation, perpetuating the cycle.
 - **Willingness of retailers to sell milk at low prices to drive store traffic.** Low prices force competitors to respond accordingly, creating additional margin pressure at the manufacturing/marketing level and weighing on premiums for milk suppliers.
 - **Incentives to sell milk at low prices to preserve pool access.** Cooperatively owned bottling companies sometimes sell milk at a loss to preserve fluid market share and corresponding access to FMMO pool revenue for their farmer members.

The Trouble With Known Costs

- Class I bottler milk costs are no secret. Many market participants see this as a major driver of shrinking (and insufficient) margins.
- Since bottling milk does not involve much product transformation, a detailed understanding of milk and packaging costs provides customers with near-perfect understanding of supplier finances.
 - Customers can easily leverage that knowledge in a highly competitive and shrinking market.
 - Most – and perhaps all – manufacturers of competitive products such as plant-based milk alternatives, water, fruit juices and soft drinks don't deal with similar exposure.
- Visible costs are not the only factor contributing to declining margins. After all, dairy product manufacturers operate under a similar regime.
 - But while cheese manufacturers cite generally declining margins, they tend to see customer overages rise/fall from year to year based on supply and demand conditions.



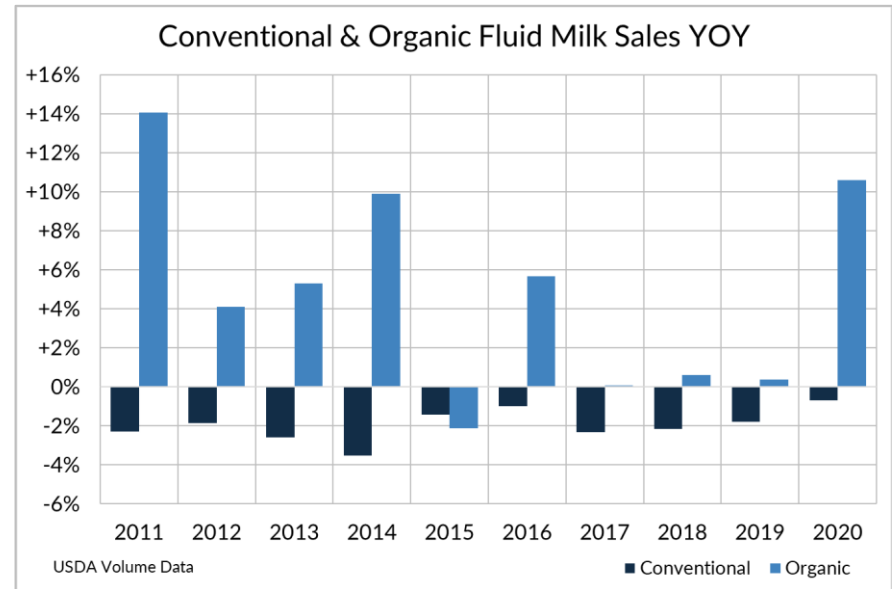
Convoluting Incentives

- All bottlers have a strong incentive to win sales in shrinking markets.
- Lost sales mean lower plant throughput and higher conversion costs on remaining volumes. This creates powerful incentives to win sales “at any price” to keep fluid plants full and stay competitive on the rest of the volume in the plant.
- Beyond normal profits, plants owned by cooperatives have additional incentives to win sales because new volume creates the ability to pool additional member milk. Losing sales in this environment creates two problems. First, cooperatives lose pool access for member milk. Second, plants that run less volume are less profitable.
- With that in mind, cooperatively-owned plants have powerful incentive to “go low” to win sales. Successfully doing so can mean better overall financial performance even if milk sells below actual cost.
- Meanwhile, for privately owned bottlers, two high-profile bankruptcies over the past few years and movement away from HTST activity spotlight the challenges associated with known costs and pool access incentives.



Notes on Organic Milk

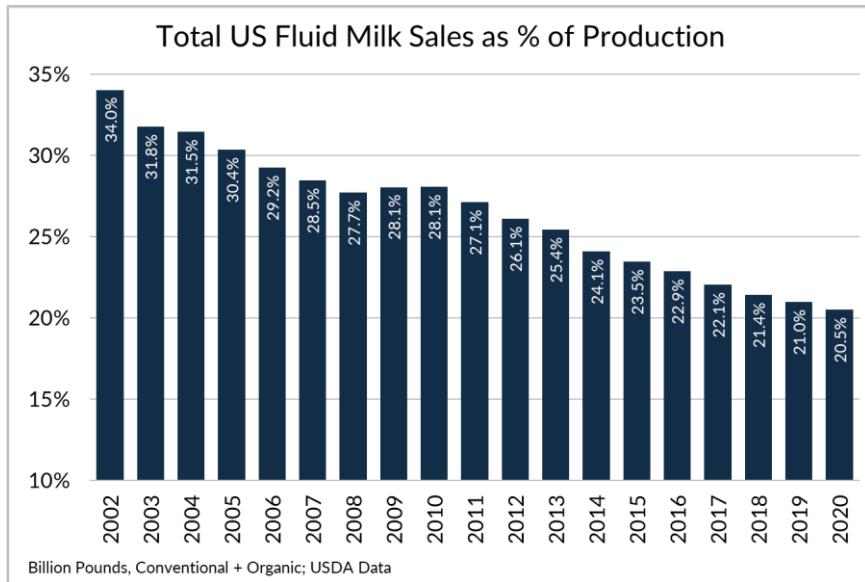
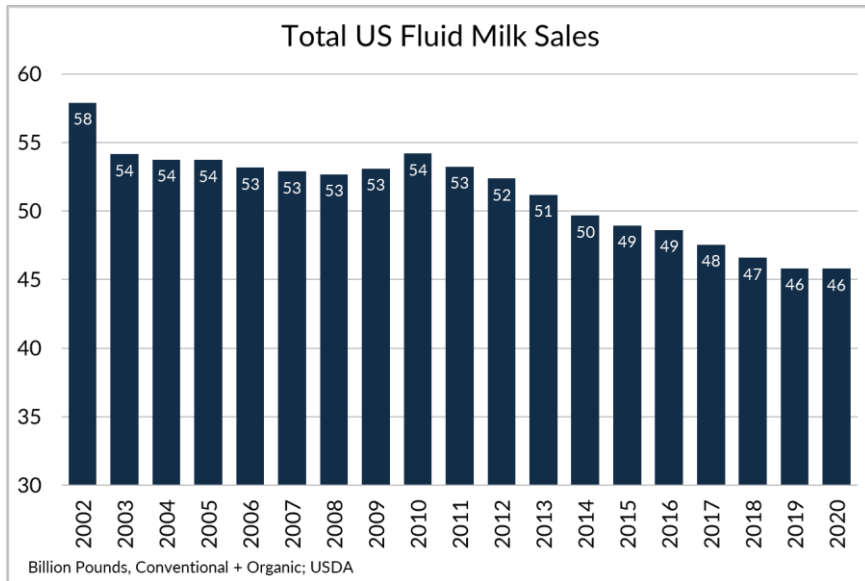
- One of the basic functions of the FMMO pooling system is to encourage supply of milk for fluid demand.
- Manufacturing class suppliers receive Class I revenue through the pool in exchange for making milk available to fluid bottlers.
- For organic bottlers, money they provide to the pool does not encourage deliveries to their plants because those dollars go to all producers, not solely to organic farms. The vast majority of this milk is not organic and cannot supply organic bottlers
- Because the pool can't incentivize production of organic milk, organic bottlers are already forced to pay all the costs associated with attracting ample supply via pay prices outside of the pool. In order to do this, organic pay prices are typically dramatically higher than the conventional Class I price, reflecting higher costs of milk production – often fixed over long-term contract periods.
- Pool dollars resulting from the sale of organic fluid milk provide a false demand signal to conventional producers that their milk is “in demand” for bottling purposes their milk is not qualified to fill.



The Future of Fluid Milk

- It was clear from our conversations that while most hope that something can be done to reinvigorate the fluid milk business, few expect a turnaround.
- Most contacts felt that since the returns from controlling pool access and using milk as a loss leader outstrip bottling profits, the best path forward was to cede the traditional HTST fluid milk business to cooperatives and vertically integrated retailers. Several bottlers, regardless of ownership structure, viewed the fluid business as dying and suggested that the strategy for the future was to limit reinvestment in plants and harvest what margin they can for as long as possible before eventually shuttering plants.
- There is still modest profit in bottling differentiated ESL products such as lactose-free, plant blends, organic, shelf-stable products, etc.
- Given the costs associated with new product innovation, marketing support for new product launches, and the exceedingly slim margins in traditional milk bottling, it seems clear that innovation in the milk category will come from outside parties differentiating into the fluid dairy space rather than from traditional milk companies.

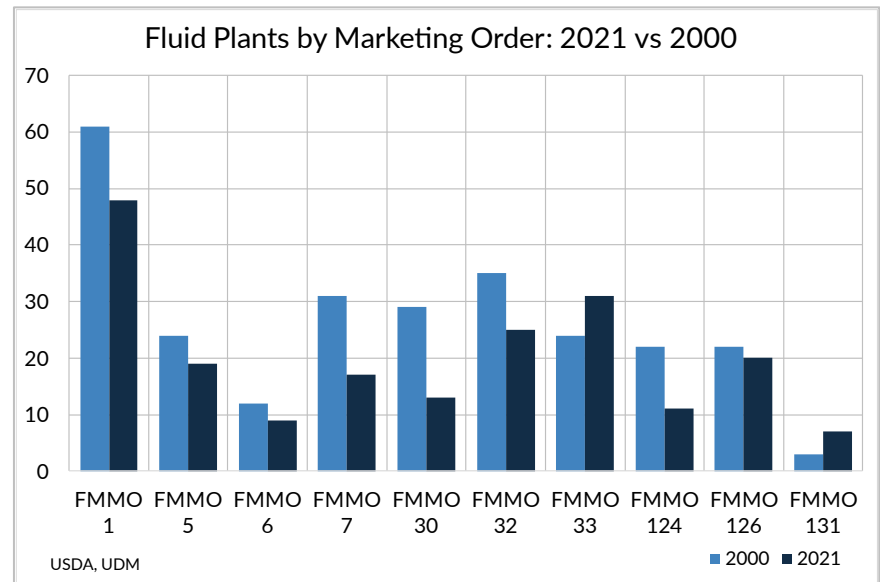
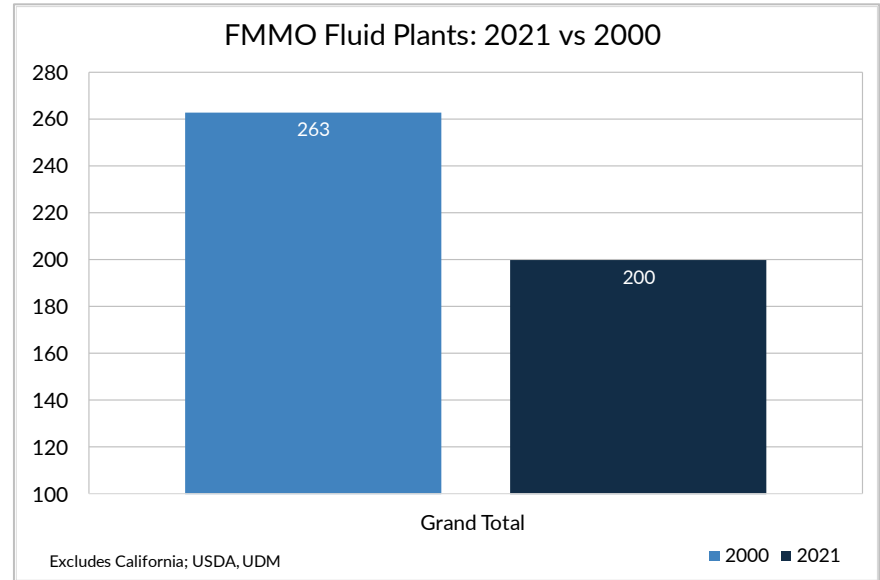
Fluid Sales & Pool Access



- Participation in FMMO pooling and pricing programs is predicated on supplying milk to fluid milk bottlers.
- Rules regarding how much milk must be supplied to bottlers vary from one FMMO to the next. But in all cases the ability to participate in the pool is limited to those who supply milk for Class I sales regulated on the FMMO.
- This is important because in many FMMO it is virtually impossible to pay a competitive price to producers without the benefit of pool access.
- FMMO receipts equal about 65% of US milk production.
- Class I utilization has moved from more than 60% in the 1950s to less than 30% recently.

Fluid Sales & Pool Access

- Pooling revenues and distributing them evenly to producers was designed to discourage competition for value-added sales that would reduce overall milk prices.
- While individual producers are not fighting over fluid sales today, the regulation essentially shifted the battle lines to cooperatives and milk buyers.
- As fluid sales have declined, the amount of milk that can participate in pooling programs has declined commensurately.
 - Keep in mind that milk production has been rising all along.
 - The end result: more milk looking for a home in ever-shrinking FMMO pools. Not surprisingly, the competition to supply shrinking fluid milk markets has gotten more and more intense.
- Firms need not actually bottle milk to gain pool access. Suppliers to fluid plants qualify. Consequently, the early stages of the battle to control pool access featured cooperatives vying for the right to supply fluid bottlers.



Fluid Sales & Pool Access

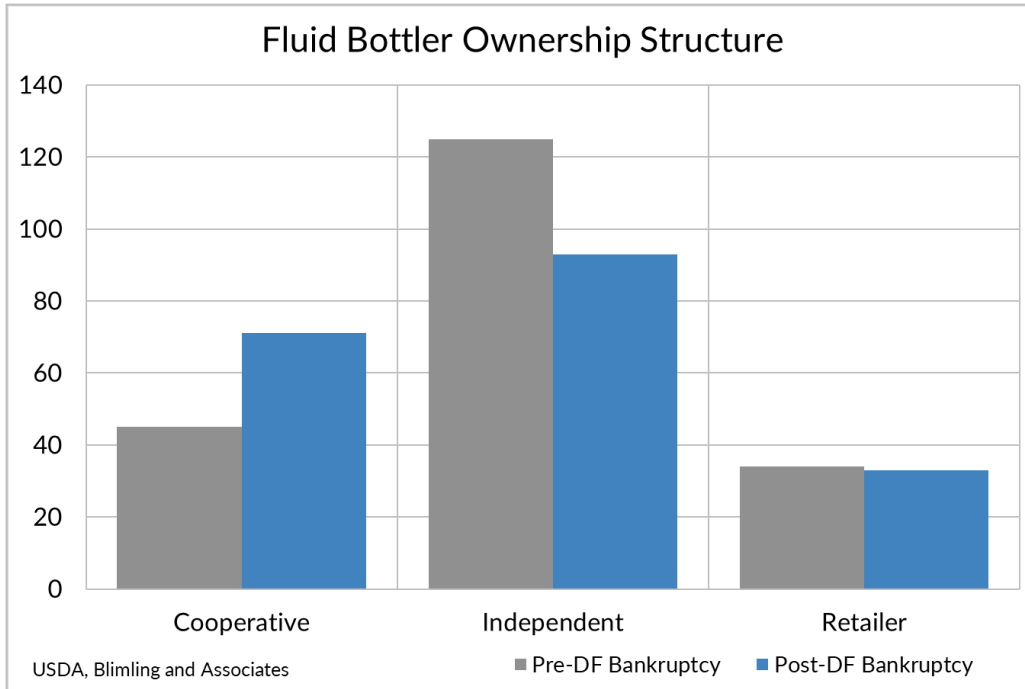
- Bottling milk has proven to be very poor business for private companies, as evidenced by the high-profile bankruptcies of Dean Foods and Borden Dairy Company.
- Fluid milk bottling is a highly competitive industry featuring privately owned, stand-alone bottlers competing alongside both cooperatively owned and retailer-owned operations.
 - Both cooperatively owned (controlling access to FMMO pools and the PPD) and retailer-owned (ability to provide best deals for milk by absorbing bottling margins into shelf price) operations have incentives to own fluid plants that are not tied to generating profit through bottling.
- The prevalence of competition not singularly focused on maximizing bottling margins and profitability is a major contributor to the recent failures of large privately owned stand-alone milk processors. It is simply not possible to maintain sufficient margins in a shrinking industry when the bulk of the market is served by competitors who benefit financially beyond margins achieved from bottling milk.

Pooling and Pool Access Example

- Assume a cooperatively owned fluid bottler is competing for a customer buying 2,000,000 pounds or about 232,000 gallons of milk per month.
- If the cooperative wins the sale, it will be able to pool additional volumes of producer milk being delivered to manufacturing plants (see “Pooled (Fluid Sale)”). If the cooperatively owned plant does not win the sale, manufacturing class milk will not have access to the pool and producers will only receive the manufacturing class price for that milk (see “Un-Pooled (No Fluid Sale)”).
- In this simplified example, the plant could theoretically discount fluid sales to the prospective customer by as much as \$0.40/gal and still be better off than forgoing the fluid sale and marketing producer milk at manufacturing class prices.
- While this is a simplified example and doesn’t consider the additional administrative and logistics costs associated with pool participation, fluid sale contracts are routinely won and lost over portions of a penny per gallon.
- Because cooperatives are not required to pay producers the regulated minimum price, they are able to discount the fluid sale enough to win the business (likely only a couple cents per gallon). Proprietary bottlers do not have this flexibility.

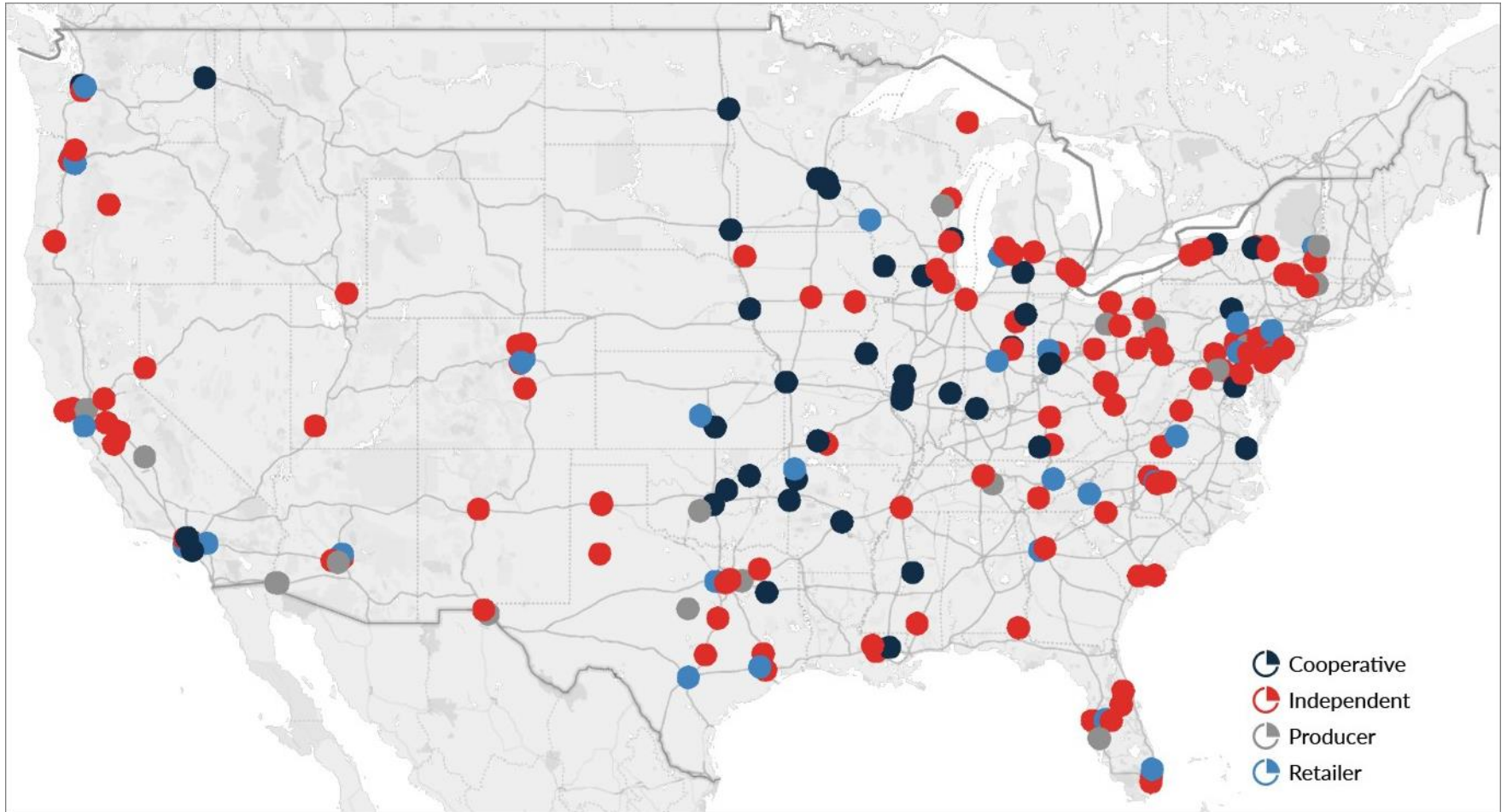
Price, Utilization and Pool Data						Producer Milk (CWT)		Total Revenue	
Class	Price	Utilization	Blend Price	Pool Payment / Draw	Un-Pooled (No Fluid Sale)	Pooled (Fluid Sale)	Un-Pooled (No Fluid Sale)	Pooled (Fluid Sale)	
Class I	\$ 21.25	33%	\$ 6.95	-\$1.95		20,000		\$ 385,950	
Class II	\$ 18.50	25%	\$ 4.61	+\$0.80					
Class III	\$ 18.00	28%	\$ 4.99	+\$1.30	50,000	40,000	\$ 900,000	\$ 771,900	
Class IV	\$ 18.75	15%	\$ 2.76	+\$0.55	50,000	40,000	\$ 937,500	\$ 771,900	
Blend Price			\$ 19.30		Producer Revenue		\$ 1,837,500	\$ 1,929,750	
						Pool Revenue		\$ 92,250	
						Pool Revenue (\$/CWT)		\$ 18.38	
						Gallons of Class I		232,019	
						Additional Pool Revenue/Gallon Class I		\$ 0.40	

DF Bankruptcy Altered the Landscape

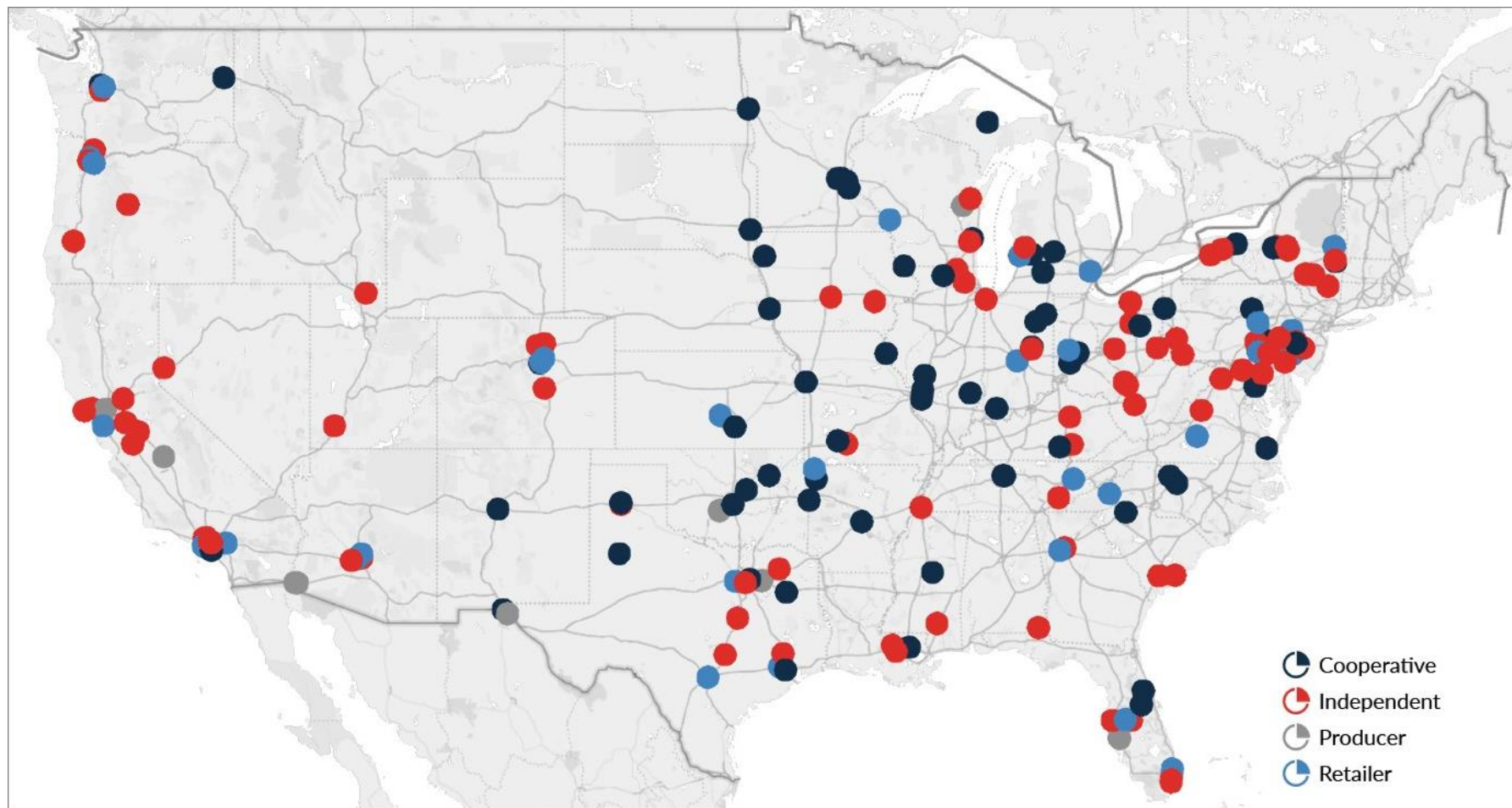


- The Dean Foods bankruptcy initiated a major shift in bottling plant ownership.
- One cooperative bought most of the assets, with another picking up several and a new joint venture involving a third cooperative purchasing two.
- Some might argue that the battle among cooperatives to supply the fluid milk market was good for bottler profitability as the period featured rapid erosion in Class I premiums. In reality, retailers may have captured that margin given the combination of milk cost transparency and declining sales. (Retailers are well aware of regulated prices and routinely demand proof of over-order premiums paid as a condition of doing business.)

Fluid Plants: Pre-DF Bankruptcy



Fluid Plants: Post-DF Bankruptcy

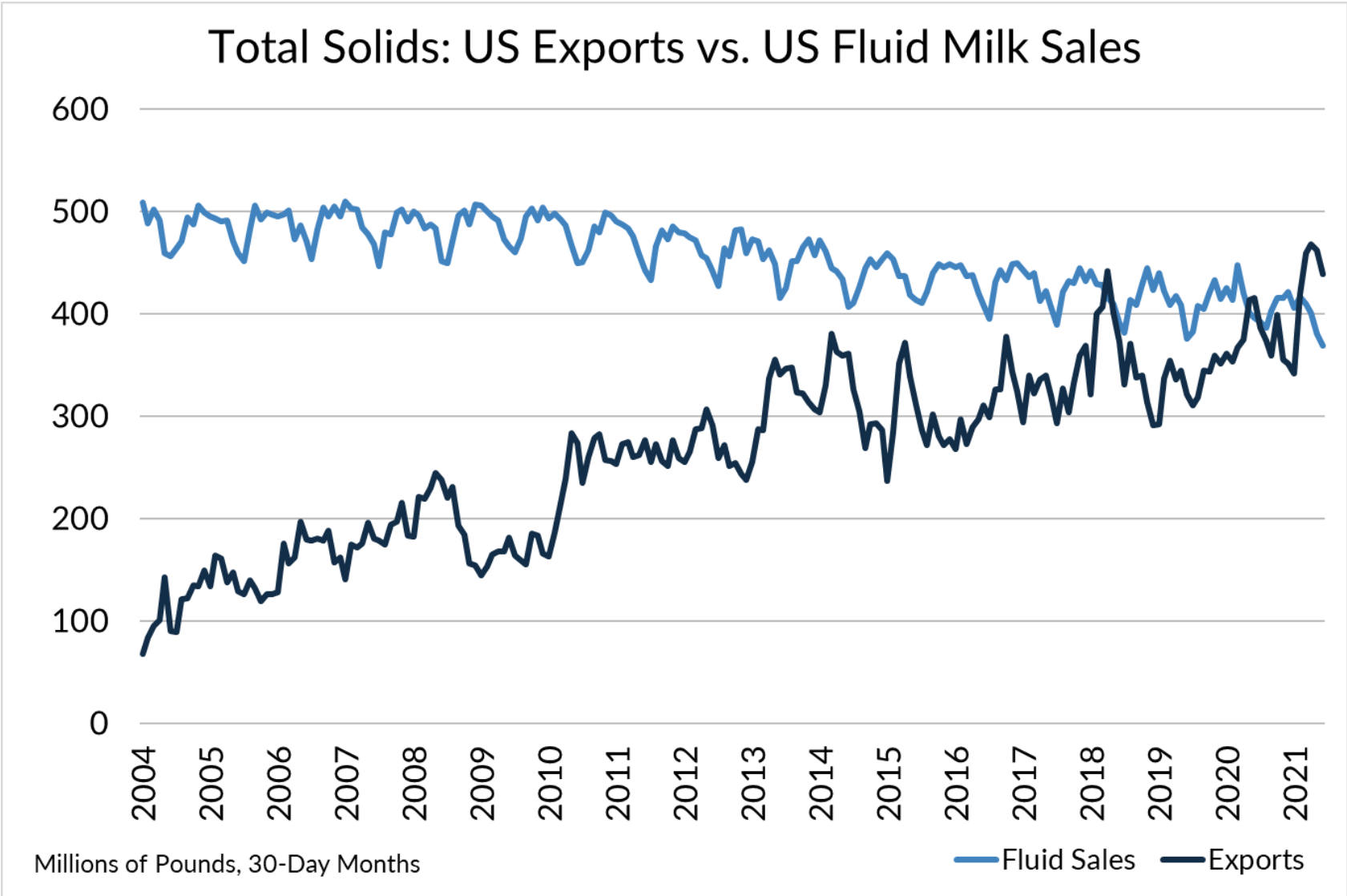


Regulation and Trade

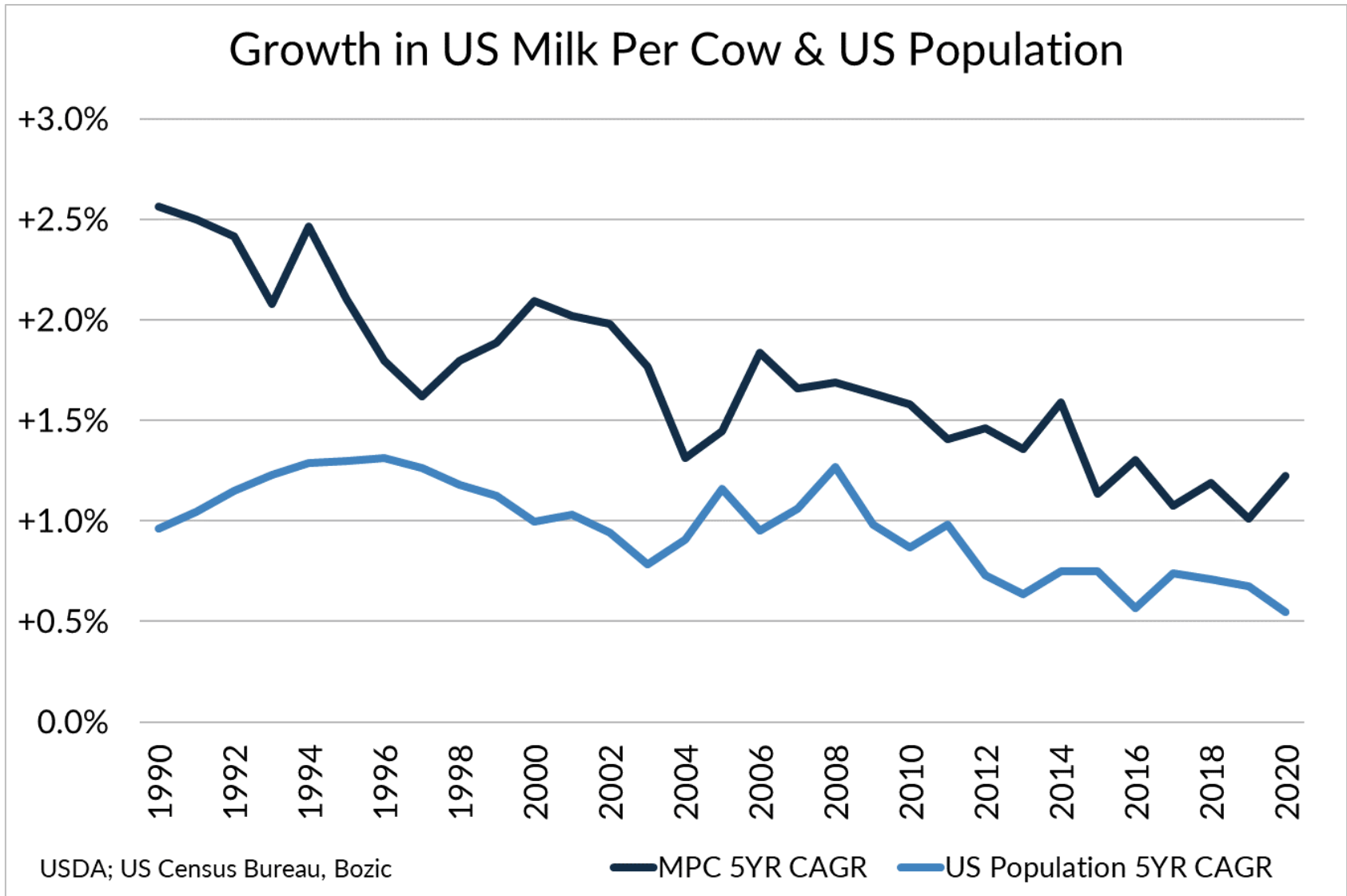
Do US Policies Hurt Export Potential?

- Many contacts told us that while FMMO regulation created numerous domestic inconveniences, the system's impact on global competitiveness was a much bigger concern.
- The specific issue: regulated manufacturers must pay for milk without knowing the price until after they've already produced butter, powder, whey or, especially, cheese. International buyers typically like to contract in advance for sales and book for several months at a time.
 - A typical scenario would involve contracting for volume and price two months in advance for a period of three or six months. In other words, in October, an international cheese buyer may seek a fixed-price and volume contract for January-through-March or January-through-June deliveries.
- This puts US manufacturers and marketers in a tight spot. They can look at futures markets and base international offers on prevailing prices. Or they can speculate on milk (or product) cost direction.
- While using futures and other derivatives to lock in costs can be straightforward, in practice, deferred pricing is often at a premium to prevailing spot and international values.
- As graphs and data on the next pages illustrate, the US will need to increase exports in the years ahead.

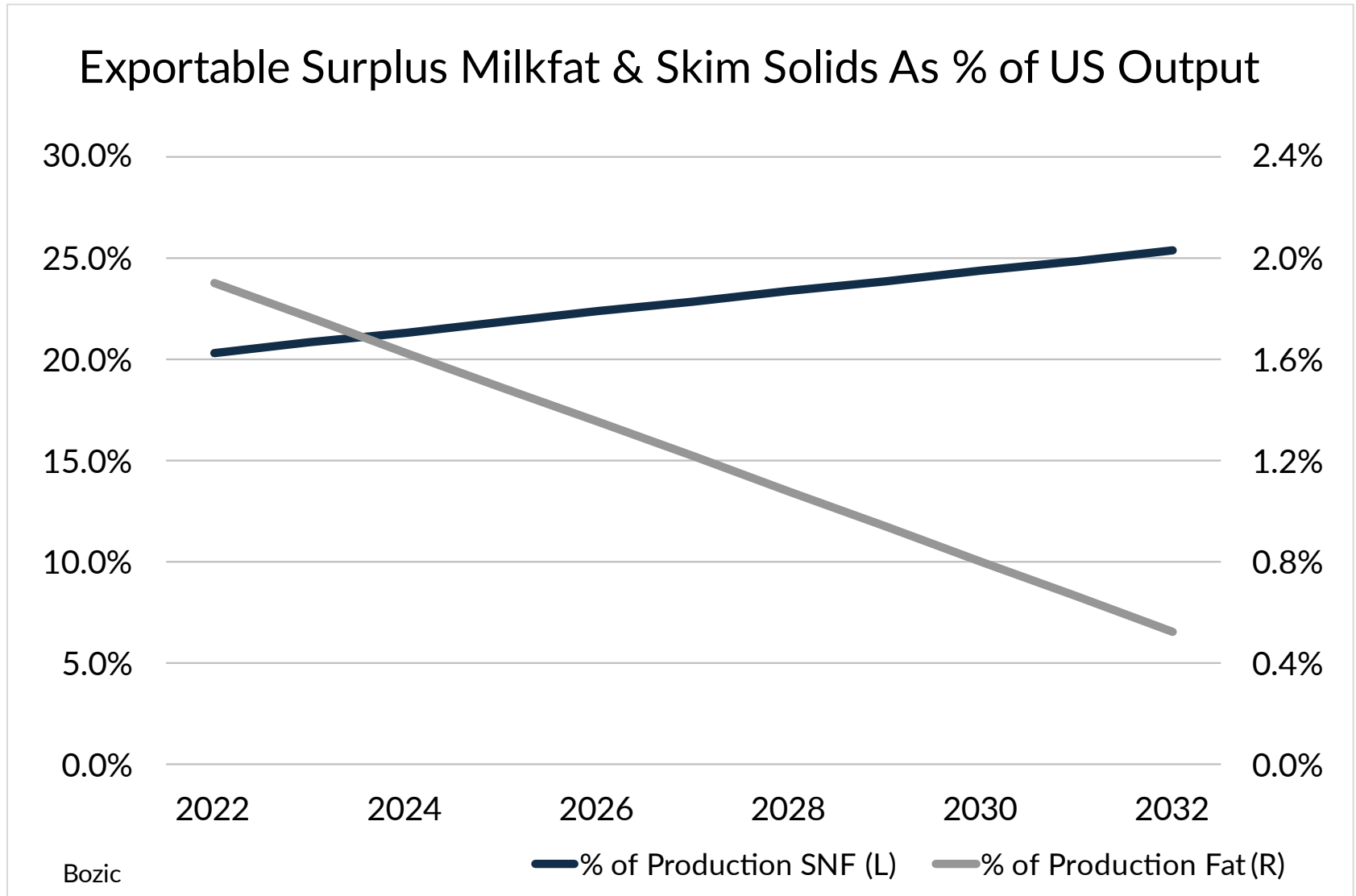
Exports Now Ahead of Fluid Sales



Productivity Growth > Population Growth



Forecast: Need More SNF Exports



Domestic Demand Forecasts

Butterfat Demand			
Trend	5 Year	10 Year	20 Year
Domestic Demand			
Population Growth	0.6%	0.6%	0.6%
Per Capita Domestic Growth	1.9%	1.6%	0.8%
Total CAGR	2.5%	2.2%	1.4%
Butterfat Demand in 2020 <i>Million Pounds</i>	8,578	8,578	8,578
Butterfat Demand in 2030 <i>Million Pounds</i>	11,021	10,734	10,001
Growth in Demand <i>Million Pounds</i>	2,444	2,157	1,424
Supply			
US Dairy Herd Size <i>Thousand Head</i>	9,388	9,388	9,388
Milk Per Cow 2020	23,777	23,777	23,777
Butterfat Test 2020	3.95%	3.95%	3.95%
Butterfat Production 2020 <i>Million Pounds</i>	8,820	8,820	8,820
Milk Per Cow 2030 <i>Million Pounds</i>	26,428	26,428	26,428
Butterfat Test 2030	4.29%	4.29%	4.29%
Butterfat Production 2030 <i>Million Pounds</i>	10,632	10,632	10,632
Growth in Butterfat Production <i>Million Pounds</i>	1,812	1,812	1,812
Exportable Surplus 2030			
<i>Growth in Supply Minus Growth in Demand, Million Pounds</i>	-389	-102	631
Surplus As Percent of Supply	-3.7%	-1.0%	5.9%

SNF Demand			
Trend	5 Year	10 Year	20 Year
Domestic Demand			
Population Growth	0.6%	0.6%	0.6%
Per Capita Domestic Growth	0.0%	0.3%	0.0%
Total CAGR	0.6%	0.9%	0.6%
SNF Demand in 2020 <i>Million Pounds</i>	16,071	16,071	16,071
SNF Demand in 2030 <i>Million Pounds</i>	17,043	17,506	17,043
Growth in Demand <i>Million Pounds</i>	972	1,435	972
Supply			
US Dairy Herd Size <i>Thousand Head</i>	9,388	9,388	9,388
Milk Per Cow 2020	23,777	23,777	23,777
SNF Test 2020	8.9%	8.9%	8.9%
SNF Production 2020 <i>Million Pounds</i>	19,967	19,967	19,967
Milk Per Cow 2030 <i>Million Pounds</i>	26,428	26,428	26,428
SNF Test 2030	9.1%	9.1%	9.1%
SNF Production 2030 <i>Million Pounds</i>	22,533	22,533	22,533
Growth in SNF Production <i>Million Pounds</i>	2,567	2,567	2,567
Exportable Surplus 2030			
<i>Growth in Supply Minus Growth in Demand, Million Pounds</i>	1,595	1,132	1,595
Surplus As Percent of Supply	62.1%	44.1%	62.1%

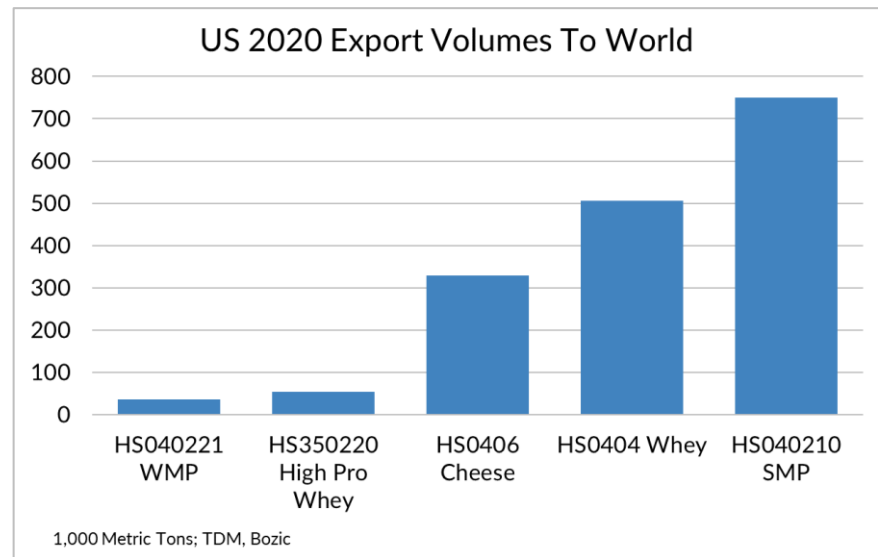
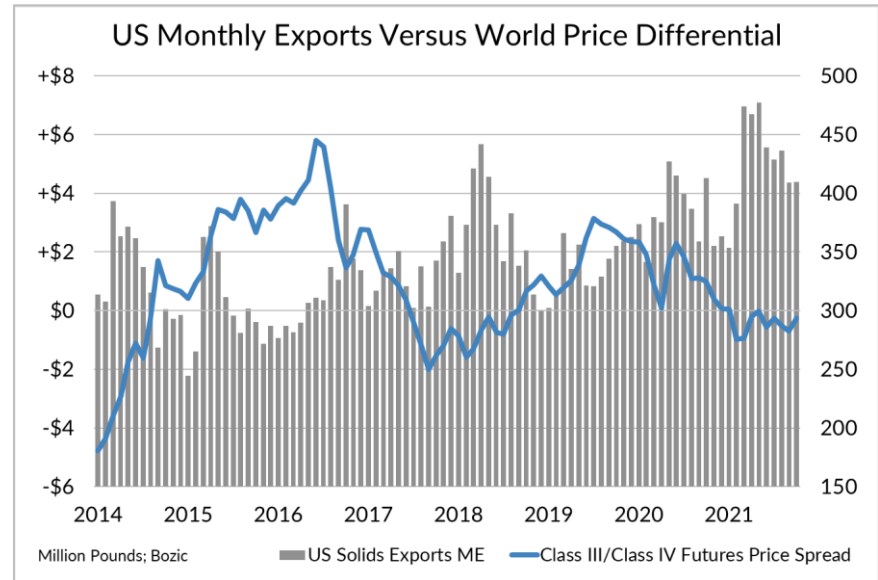
Supply Assumptions: flat dairy herd, 1.1% per-cow annual gains, 0.03% annual butterfat test growth, 0.02% SNF test growth

Regulated Price Impact on Exports

- International competitors employ a number of different approaches to determine producer milk prices, as noted elsewhere. Here's what's important as far as exports are concerned: primary US competitors do not contend with the constraints of regulated pricing schemes.
- International manufacturers typically establish and/or bilaterally negotiate farm milk pay prices based on anticipated revenue from future contract sales. They don't deal with regulated minimum prices or face intense competition for farm milk based on performance versus known values.
 - If nothing else, international marketers can look at US milk futures every day to gauge the pricing landscape and establish competitive offers accordingly.
- Bottom line: foreign competitors have the luxury of winning sales first and then determining farm pay prices.
 - Obviously, they need to be competitive in milk procurement over the long term. That requires working diligently to receive the highest values possible for finished goods while clearing the volumes necessary to absorb their entire milk supply.

Regulated Price Impact on Exports

- While US manufacturers access value-added sales revenues through FMMO pools, manufacturers in other countries deploy more differentiated business models with direct exposure to value-added markets (fluid, yogurt, infant formula, protein powders, etc.) in order to guarantee competitiveness.
- One foreign competitor suggested that it considers it a failure of marketing efforts to find itself competing with US manufacturers for spot sales of commodity cheese or SMP.
 - Foreign competitor said that it expects to clear all volume through value-added markets or small volumes of contract commodity sales.



Regulated Price Impact on Exports

- A look at average export values and product mix for the US, EU and NZ tells an important story.
- Because the US is focused on exporting commodity products and opportunistic participation in spot sales, value per pound lags the EU and NZ.
- The relative success of US SMP exports is clearly a bright spot in trade. But some contacts noted that US SMP export prices typically run materially below international price quotes or export values.
- When discussing the reasons for lower US SMP prices, international buyers explicitly mentioned that US powder manufacturers are primarily concerned with clearing large volumes of producer-member milk and keeping plants running full rather than focusing on highest-quality, highest-value product.
 - Buyers stated that US manufacturers are capable of making high-quality SMP, as good as anyone in the world. The problem is that they won't commit to making superior quality powder year-round and under all pricing scenarios. Therefore, US manufacturers are often not included in RFQs for the highest-quality milk powders.

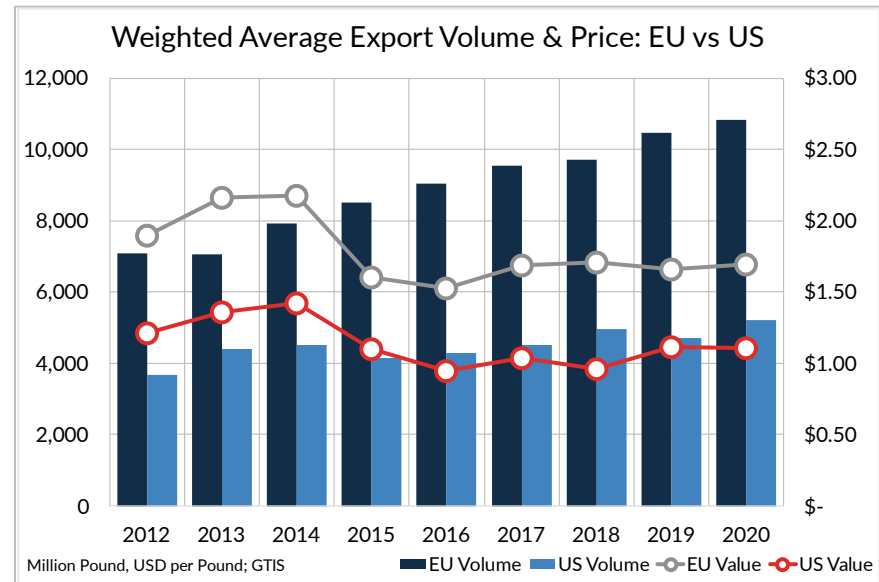
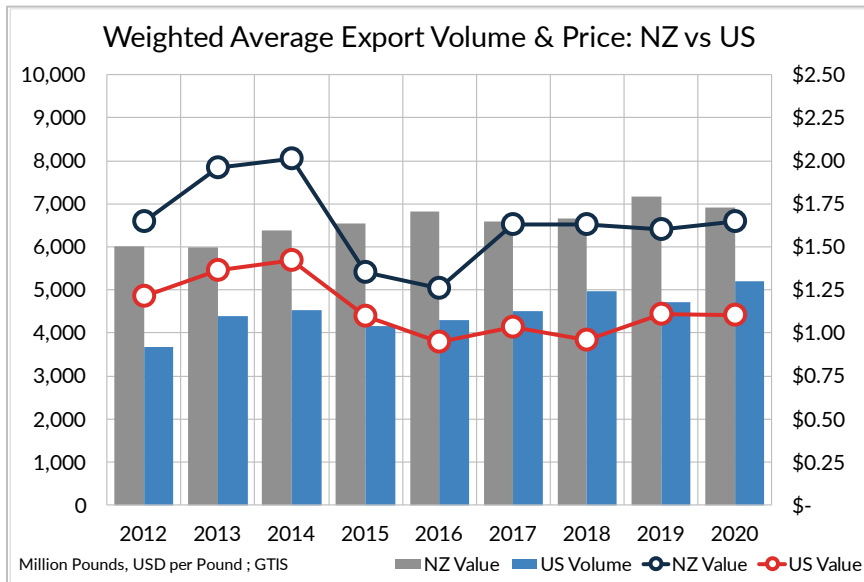
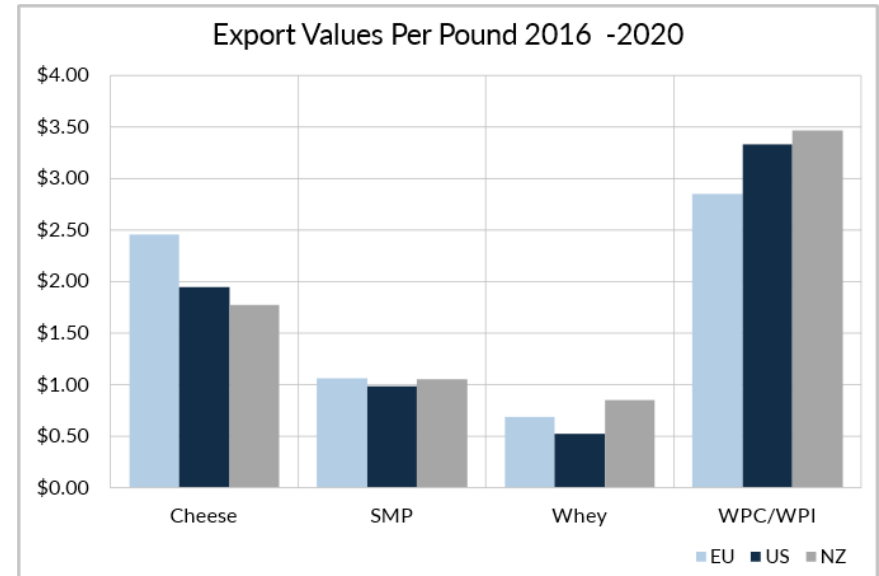
Regulated Price Impact on Exports

- One key driver of US success with powder exports is actually a function of FMMO regulation: the fact that classified pricing and pooling subsidize NFDM/SMP production costs.
- SMP manufacturers' access to pool revenues allow them to pay a competitive price for milk with dollars taken from other producers in the marketplace.
 - If these manufacturers had to pay a competitive milk price "out of their pocket" they would buy dramatically less milk and make significantly less powder and/or they would need to charge customers materially higher prices and likely lose significant export sales.

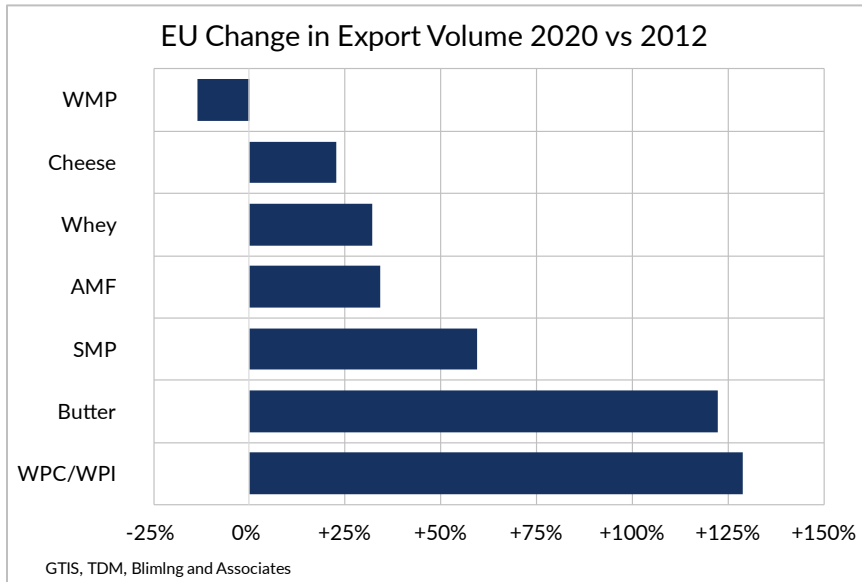
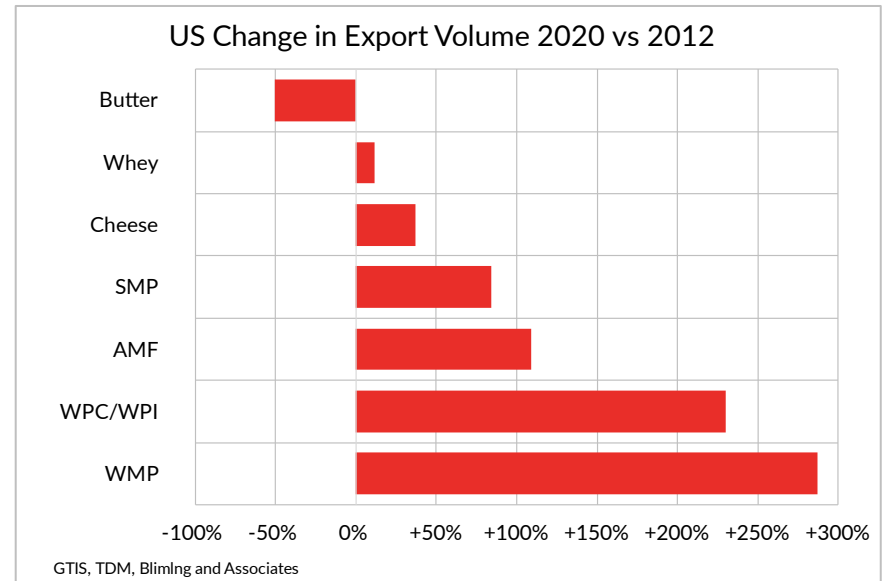
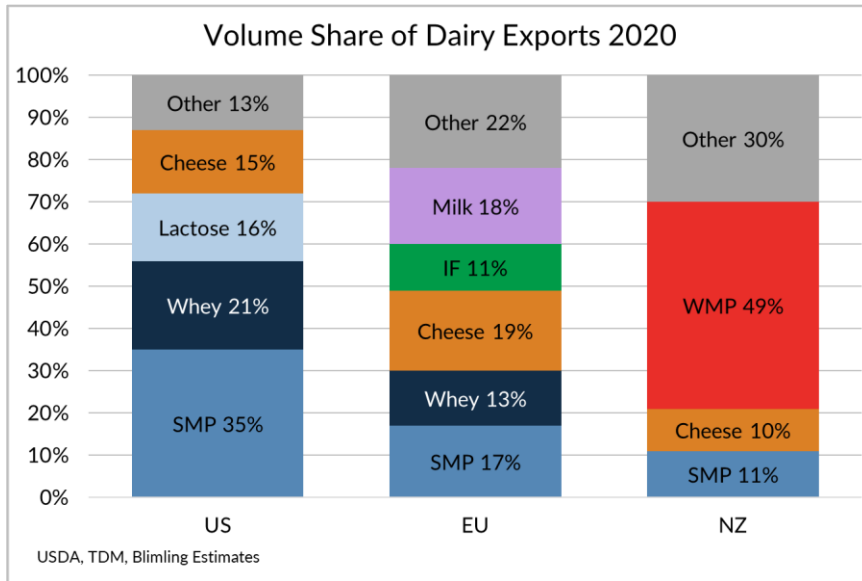


Why Do US Export Values Lag?

- Simply put, comparatively low-value products make up a bigger share of US exports.
- From 2012 through 2020, EU weighted average unit prices on exports averaged \$1.64 per pound compared to \$1.14 for the US. Meanwhile, EU volume increased 53% over the period compared to +41% for the US.



Why Do US Export Values Lag?

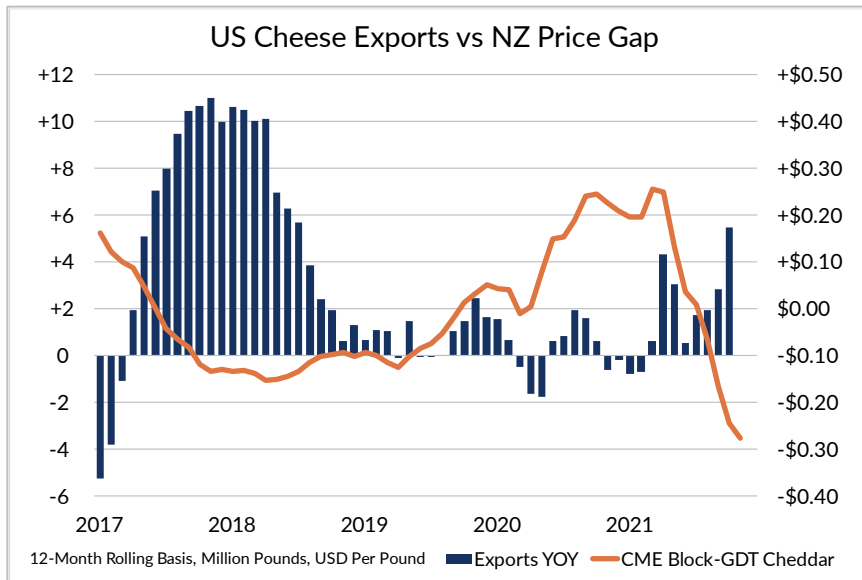
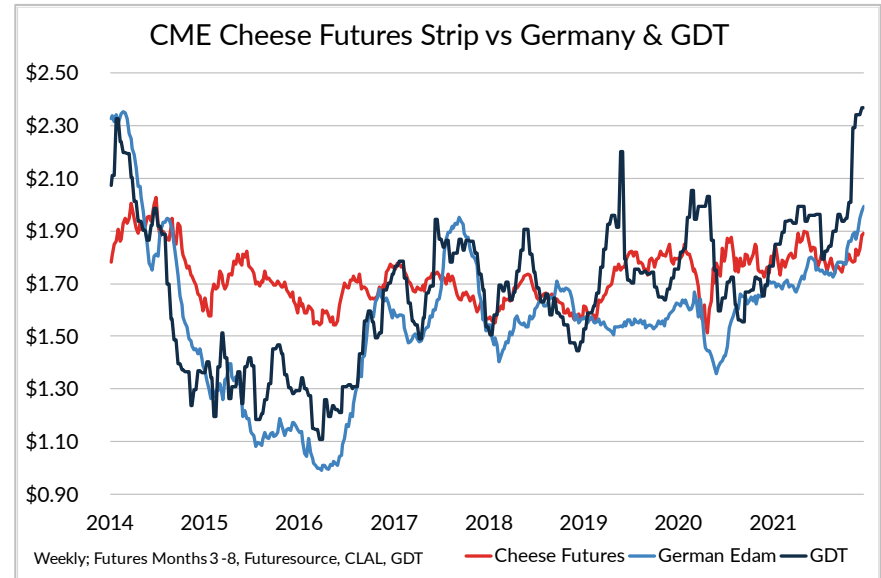


Regulated Price Impact on Exports

- There are certainly times when the forward price curve allows US manufacturers to be competitive. Those occurrences are not frequent enough, however, to allow the regulated manufacturers to be consistent exporters.
- It was clear from our conversations that cheese exports are more likely to come from unregulated manufacturers.
 - Regulated manufacturers/marketers tend to increase participation on a spot basis in times of US oversupply and when prices are well below international quotes.
- Contacts suggested that because US firms are not regular suppliers to the export market, they miss out on more than just consistent monthly commodity volume. They also forego opportunities to participate in value-added business that requires consistent monthly deliveries at fixed prices.

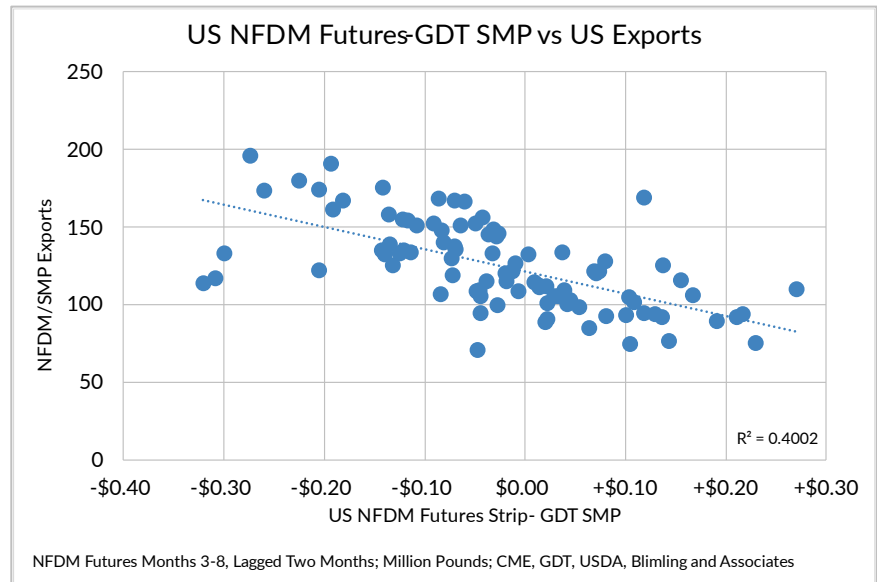
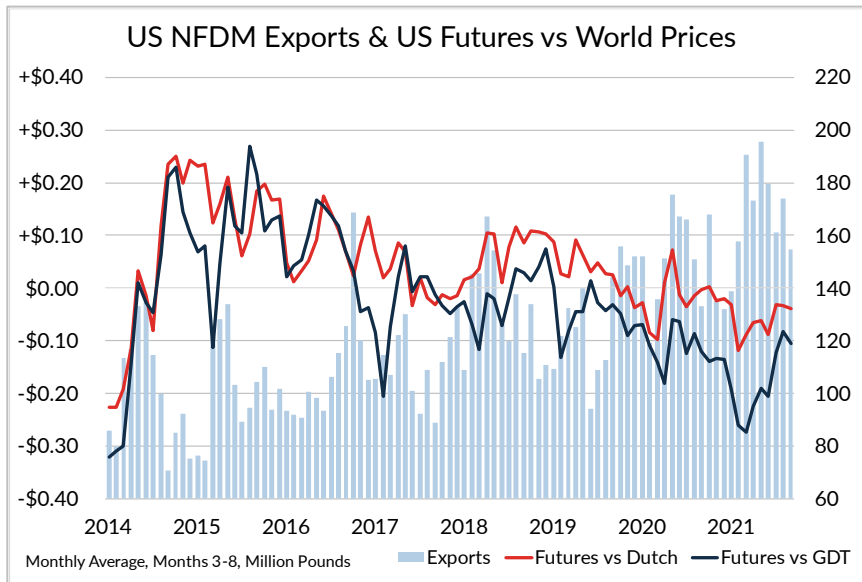
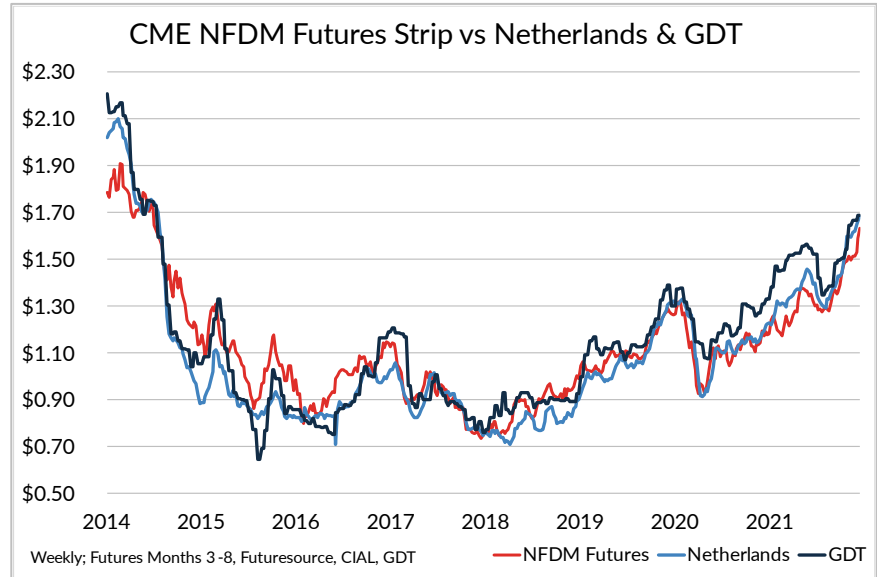
Pricing & Exports

- US cheese exports tend to flourish when forward pricing is competitive with GDT.
- Going back to 2014, on the 20 occasions where the CME futures strip was 10 cents or more below GDT, exports two months later averaged 70 million pounds, compared to 62 million pounds in the other months (+15%).
- Difference was only +6% when looking at futures strip versus German prices.



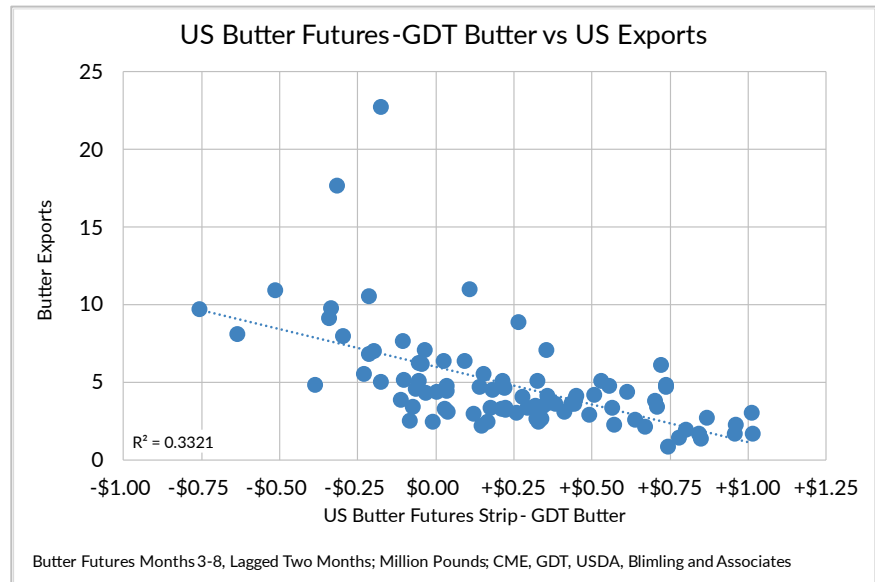
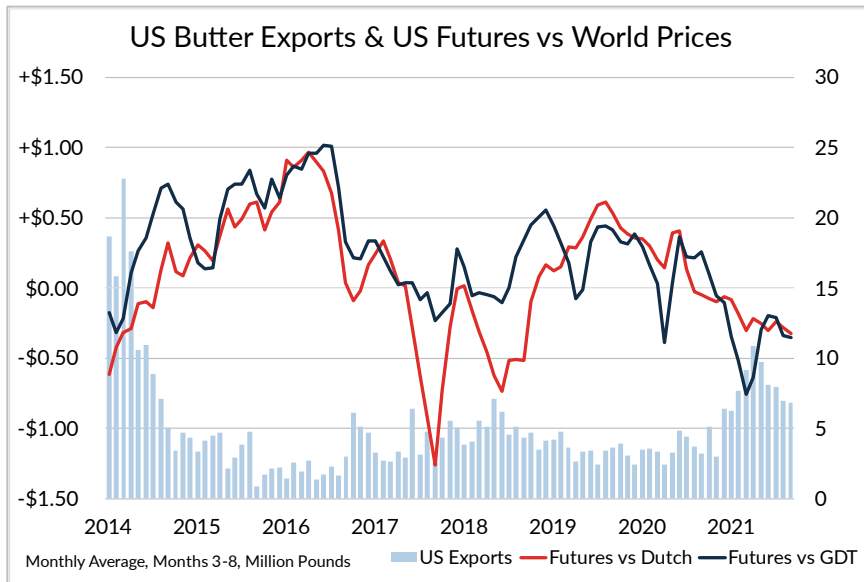
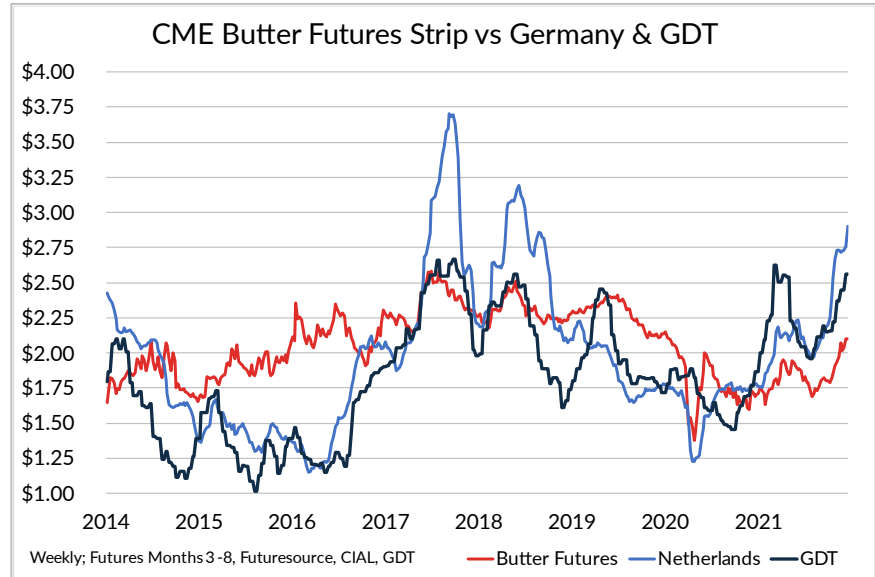
Pricing & Exports

- US NFDN/SMP export volume tends to accelerate when US futures strips price at 10 cents or more below GDT SMP.
- Going back to 2014, in the 23 months featuring futures at 10 cents or more below GDT, US exports two months later averaged 150 million pounds, compared to 116 million pound the rest of the time (+29%).
- Volume increase is +8% with same price gap versus Dutch quotation.



Pricing & Exports

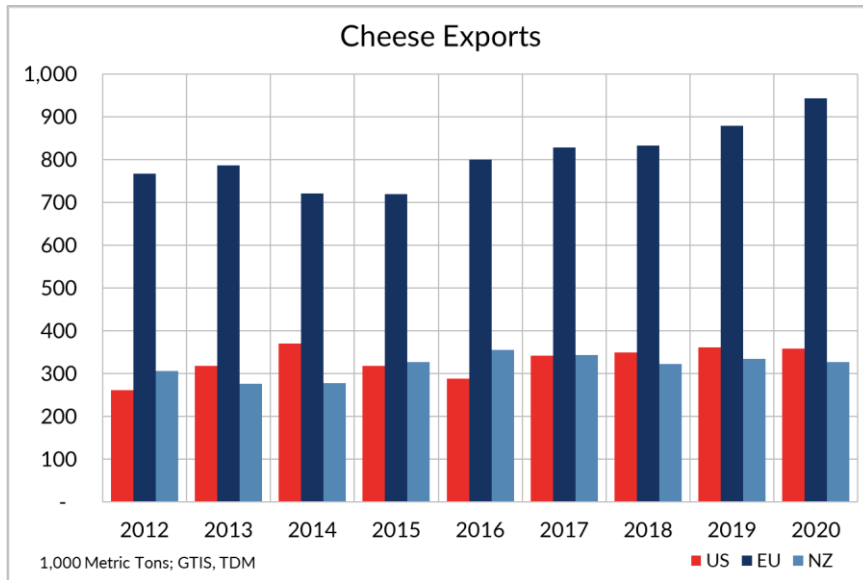
- US butter exporters face myriad challenges, given that domestic production tends to be 80% salted and world markets want 82% unsalted.
- Going back to 2014, US exports average 9 million pounds per month when the CME futures strip is priced at 10 cents or more below GDT, compared to 4 million pounds otherwise (+131%).
- Volume strength is similar versus the EU.



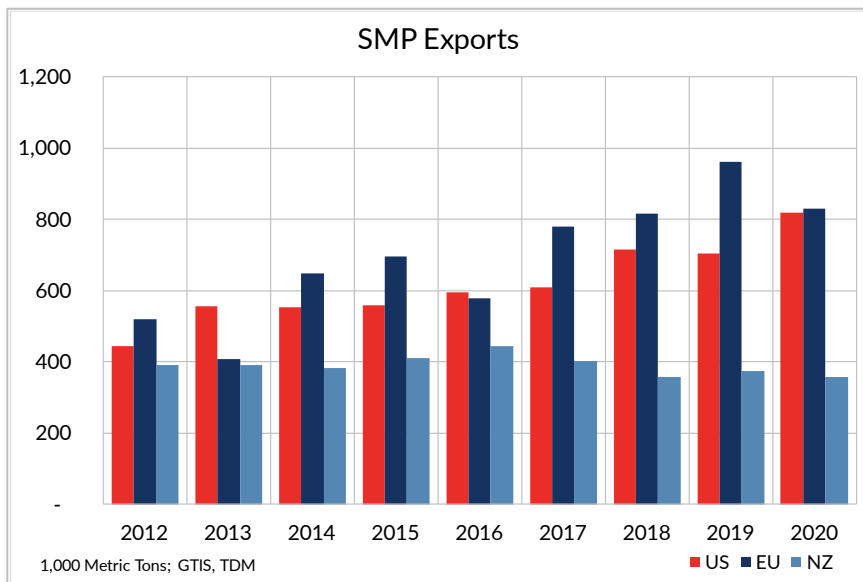
Regulated Price Impact on Exports

- Given declining fluid sales and low-single-digit domestic demand growth for other dairy products, the US needs to export any milk production growth above 0.75%-1.0%.
- As a result, export competitiveness has become a high priority for US manufacturers and marketers. Those companies are frustrated with FMMO impact on consistent export market capabilities.
- It is important, however, to point out that several US manufacturers are not necessarily bound by FMMO minimum payment provisions.
 - This makes for some bright spots in US export activity in spite of challenges posed by regulated prices.
 - Examples: Idaho, Nevada, parts of the Dakotas and parts of Nebraska.
 - Also, some manufacturers are located in regulated areas featuring low pool draws, negating the need to participate in FMMOs. This is increasingly the case in the middle part of the country and in California.
 - Cooperatively owned manufacturers are not bound by the minimum payment provisions of the FMMO

Regulated Price Impact on Exports



- The significant and growing percentage of manufactured product output that is taking place outside the bounds of minimum milk pricing is good news for the US, in a way, as it offers promise of some export growth.
- Operating outside of FMMO regulation offers a bit more international opportunity for cheese manufacturers. However, interviewees were quick to point out that, in many cases, manufacturers operating outside of FMMOs must still compete for milk with firms paying regulated minimum prices.

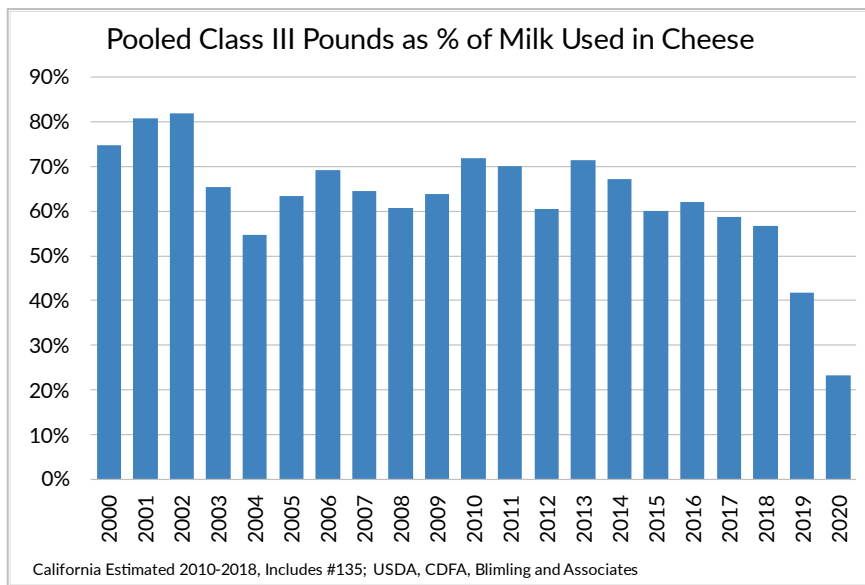
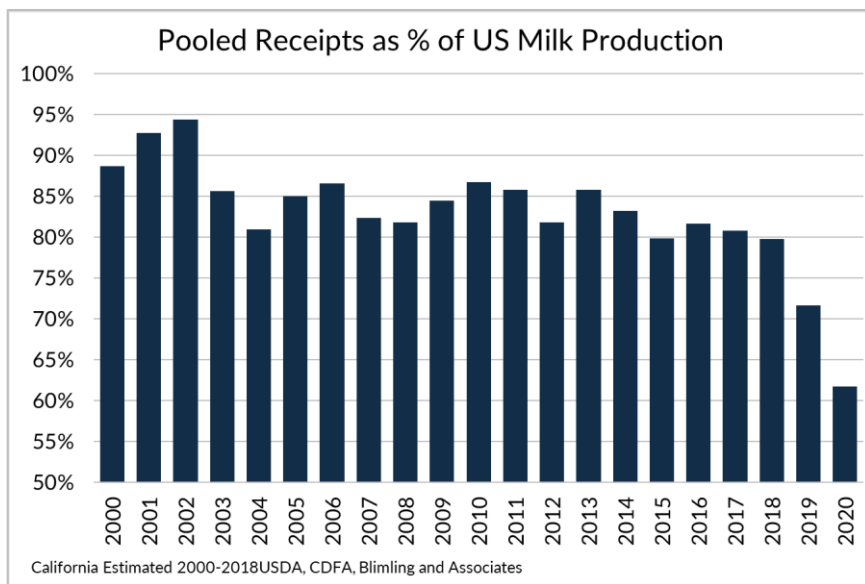


Regulated Price Impact on Exports

- Our industry conversations suggest that FMMO impact on competitiveness was primarily felt in value-added products, especially cheese.
- Discussions revealed two primary reasons why cheese exports may be more problematic than the various milk powders. The first was that powders are storable and can be sold from inventory in large quantities when pricing is favorable. Meanwhile, unless frozen, cheese properties change as they age. That requires “make to order” for most cheese exports. The second reason cited was cooperative ownership of the overwhelming majority of SMP production.
- It is irrefutable that SMP is the biggest success story amongst US dairy products. Respondents largely believed that the growth of SMP exports was a function of FMMO regulation that encourages the building of powder plants by subsidizing the milk into those powder plants through the pool draw. Equally important is the cooperatives’ ability to “hit the bid” internationally regardless of the competitiveness of US pricing and then simply pass along any losses on sales to producers by re-blending pay prices.

Regulation Realities

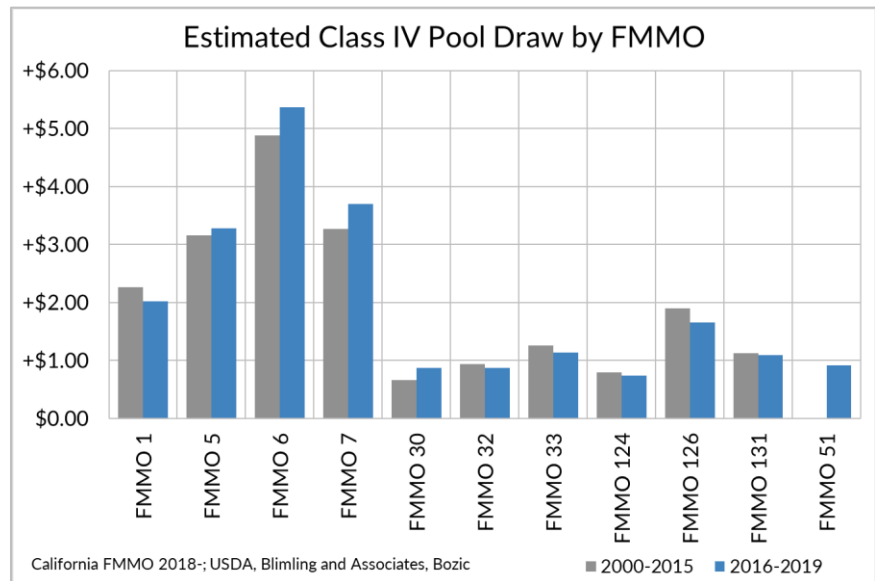
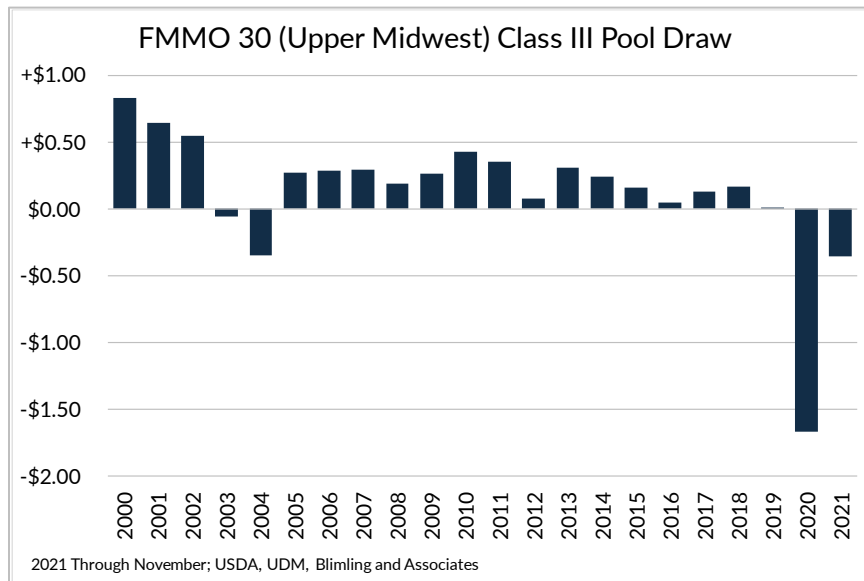
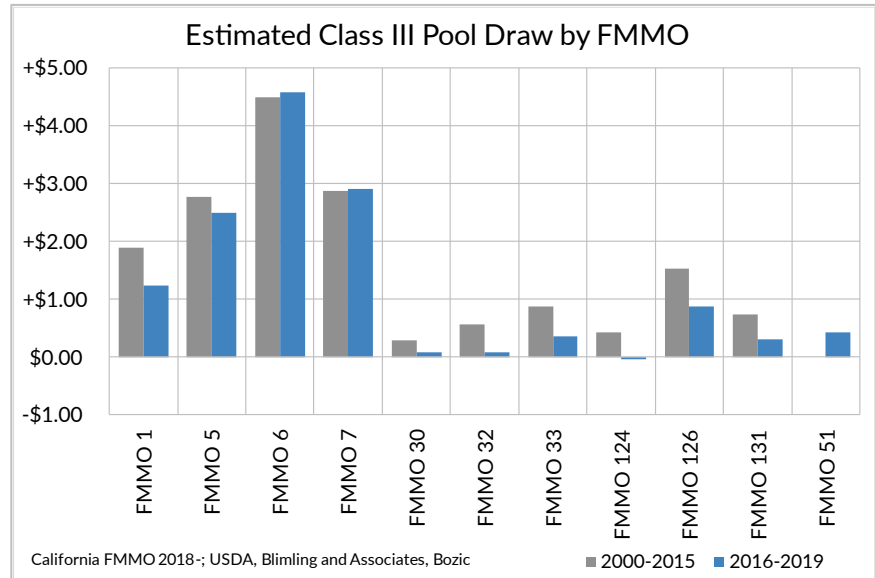
To What Degree is US Dairy Regulated?



- In practice, the only companies truly subject to FMMO minimum pricing are privately owned processors buying milk in the East.
 - Those processors need pool dollars to pay competitive prices to producers.
- Elsewhere: in many cases, available pool dollars are not as critical for attracting milk.
- We tend to speak of the US dairy industry as if it is highly and homogeneously regulated. Reality: when it comes to minimum pricing, the industry is far less regulated than many think – and is becoming less so all the time.
 - Cooperatives are exempt from making minimum payment to member owners.
 - There are significant unregulated areas in the US where manufacturers may feel regulated prices influence competitive procurement, but they do not have to participate in the system.
 - Declining fluid sales are diluting the benefits of participating in the regulated system. Consequently, more manufacturers are choosing to step outside of the regulation.

Average Pool Draws

- Class III pool draws in FMMO 30 (Upper Midwest), 32 (Central), 33 (Mideast), 124 (PNW) and 131 (Arizona) averaged less than 30 cents annually from 2016 through 2019.
- Using a simple average, those five orders had a 15-cent draw from 2016 through 2019 compared to +57 cents from 2000-2015.
- Class III players in those regions don't necessarily need those dollars to attract sufficient levels of farm milk.



Regulation Realities

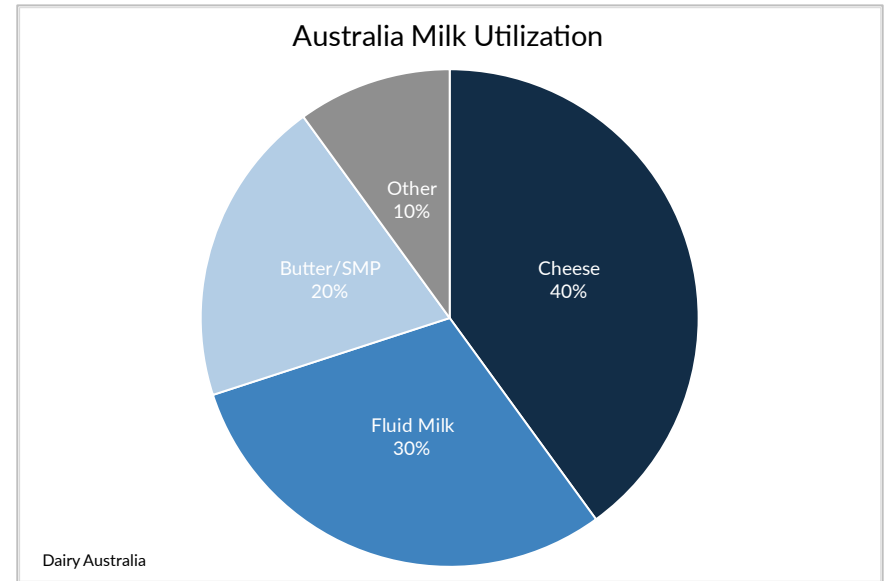
- US milk pricing regulation is often presented as consisting of two primary instruments: classified pricing and revenue pooling. In reality, the current system features two other main functions that often get overlooked or taken for granted.
- Terms of trade regulation:
 - Handlers pooled on the FMMOs must pay producers in a timely manner, e.g. in FO 30, handlers must pay each producer such that the payment is received by each producer no later than the 17th day after the end of the month.
 - Market administrator verifies or establishes weights, samples and tests of producer milk for producers who are not receiving such services from a cooperative association.
- Information services:
 - Mandatory price reporting: National Dairy Products Sales Report
 - Advanced and Full-Month Commodity and Class Prices
 - Milk utilization by product type for pooled milk.

“Doing Nothing” = Gradual Deregulation

- Competitive difficulties brought on by restrictive US price regulation are slowly pushing the industry toward voluntary deregulation in several ways.
 - Shrinking Class I sales and pooled milk volumes due to a stagnant fluid milk industry lacking innovation.
 - Increased producer/cooperative ownership of manufacturing assets and compensation of dairy producers below regulated minimum prices.
 - Voluntary decisions by manufacturers to remove their milk supplies from the regulated pricing system as the benefits to pooling shrink (the pool draw) and the value of being outside the FMMOs increases (pricing flexibility, export opportunities, risk management capabilities).
- Is there a way to relax pricing regulations to restore incentives to operate inside the regulated system and give FMMOs a new lease on life?
- Is it better to leave the system intact and allow the free market to reward those who are in position to step outside of FMMOs, continuing down a path of gradual deregulation?

Country Profiles

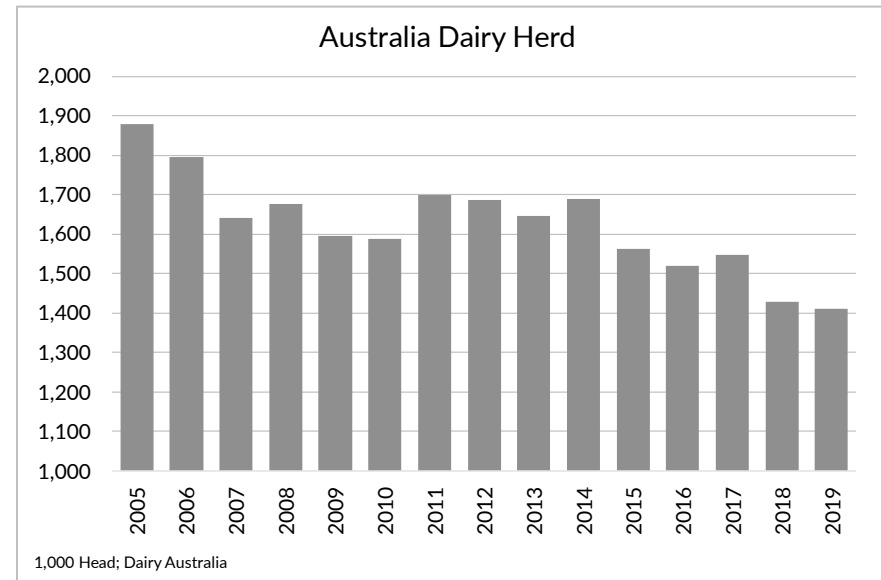
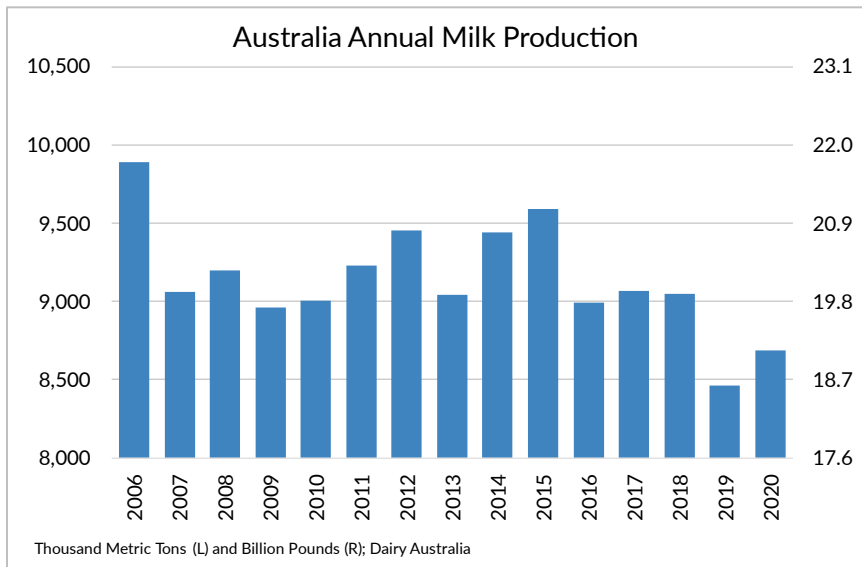
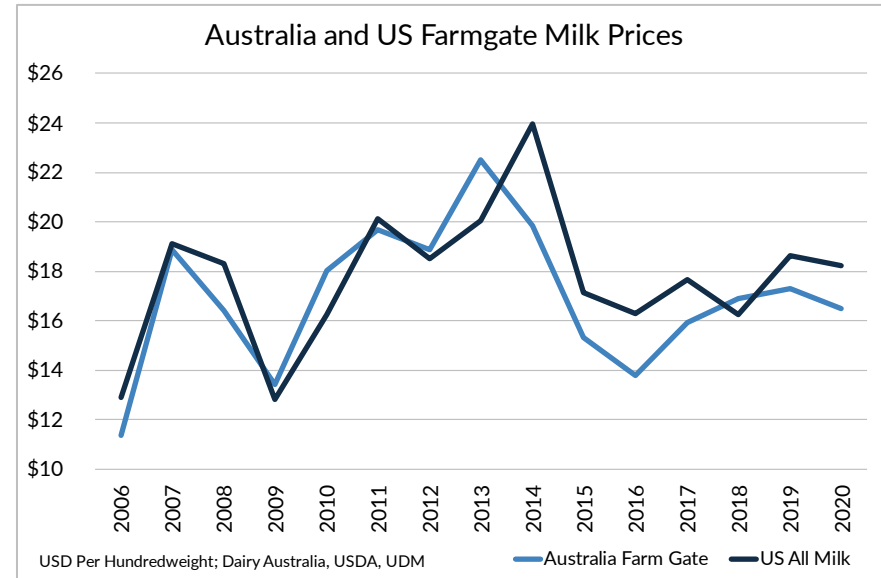
Country Profile: Australia



- Australia milk production is equal to a little less than 10% of US annual output
- The nation largely features a pasture-based milk production system.
- Most milk is produced in southeast Australia, in Victoria, New South Wales and Tasmania.
- Australia exports 30% of milk value exported, representing 4% of world dairy trade.
- Australia deregulated its milk pricing system in 2000. New measures introduced in 2020 govern milk supply agreements 'content and conduct' without imposing regulated price minimums.

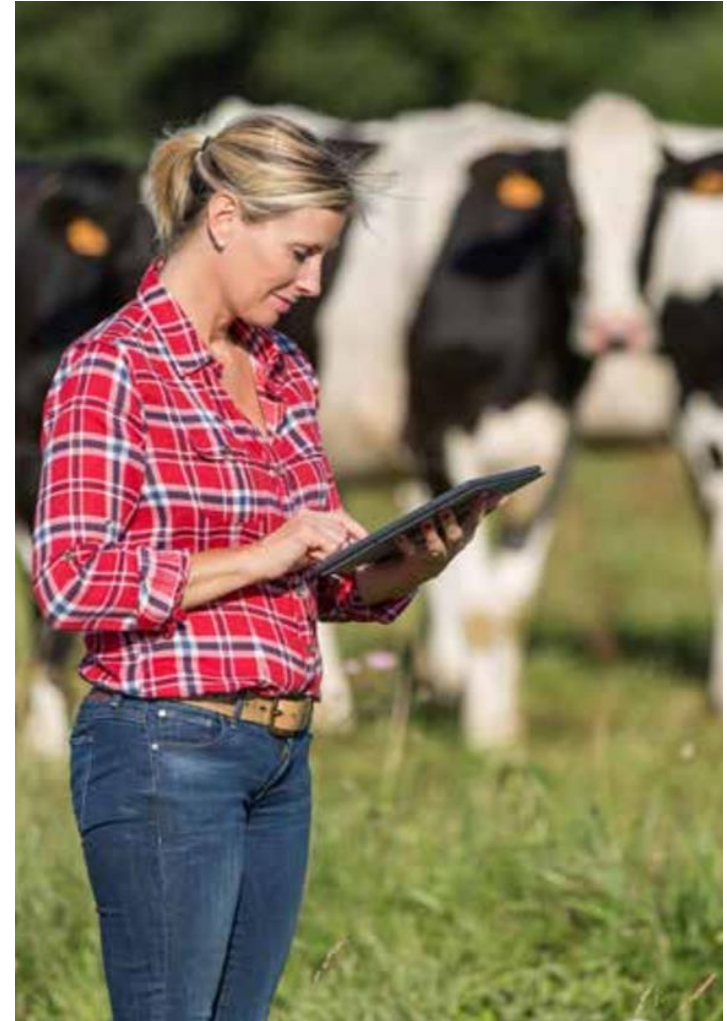
Price & Production Trends

- Due to adverse weather patterns milk production volume is trending down since 2005, with processing capacity exceeding available milk supply by 20-30%.
- Total herd size has dropped, with average herd size climbing over time.
- From 2016 to 2020, Australian prices averaged \$16.09 per hundredweight compared to a \$17.42 all milk price in the US (-8%).



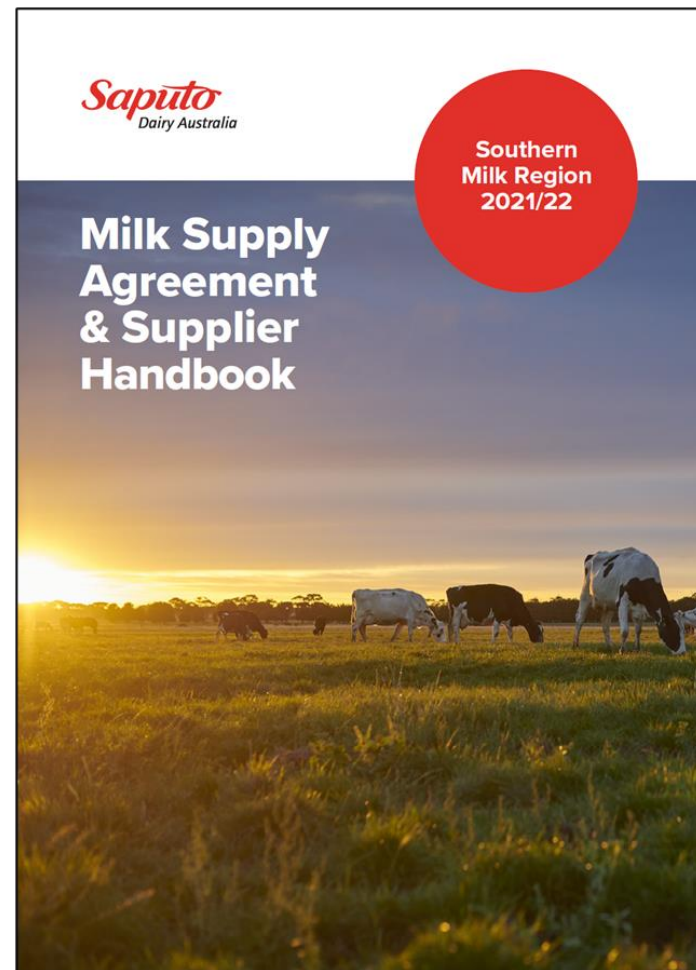
Dairy Industry Code of Conduct

- In response to:
 - An imbalance in bargaining power between dairy farmers and processors
 - Industry practices muting market signals to farmers
 - Unreasonable transfer of risk to farmers
- Objectives:
 - Improve clarity and transparency of trading arrangements between dairy farmers and milk buyers
 - Provide flexibility to support ongoing reform, innovation and diverse business models
 - Allow farmers and processors to negotiate contractual terms that suit their individual circumstances and business models
- Timeline
 - Came into effect on January 1, 2020



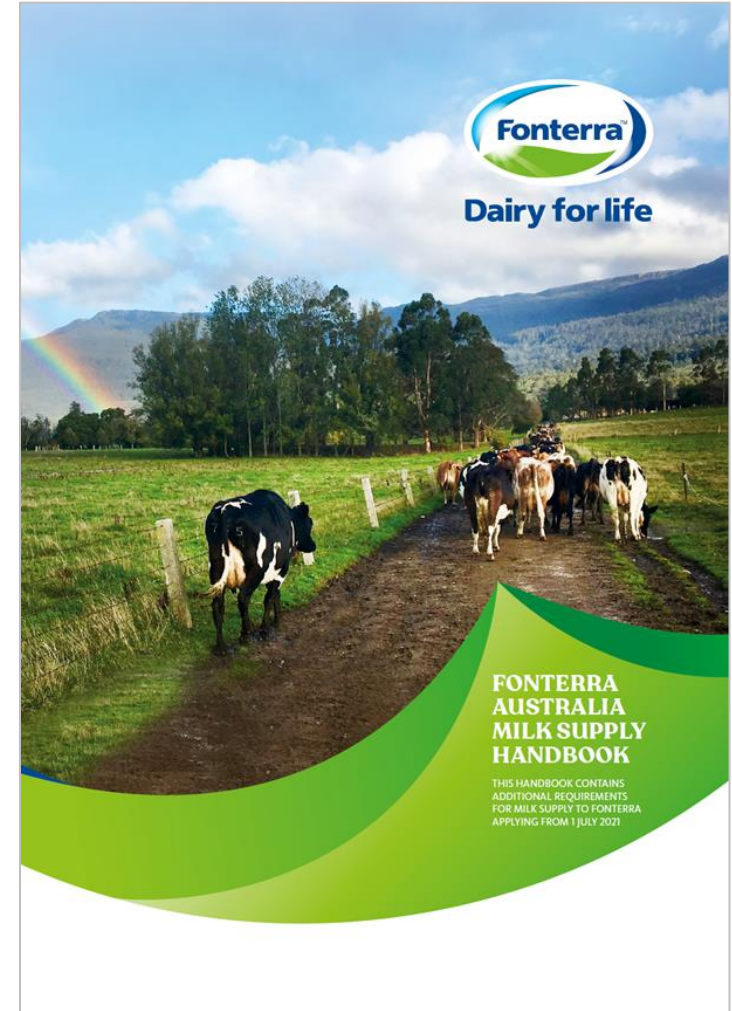
Milk Supply Agreements

- The Dairy Code requires processors to only purchase milk under a milk supply agreement.
- All milk supply agreements must comply with the Code:
 - Specify the supply period of the contract, including a final calendar date.
 - Specify a minimum price paid for the milk
 - “Step-downs” (price reductions) are not allowed except in limited and extraordinary circumstances
 - Specify quality and quantity requirements, including testing procedures.
 - Include a 14-day colling-off period (walk-away rights within 14 days of signing the agreement).
 - Does not allow for unilateral variation of a milk supply agreement by a processor
 - Require a dispute resolution procedure
 - Exclusivity requirements precludes volume limits or tiered pricing



Minimum Price Must Be Justified

- Processors must state the reasons why they set minimum prices at chosen levels. For example, the minimum price Fonterra pays in any season is determined using the following criteria:
 - The expected milk production forecast for each region taking into account any available industry milk production outlook
 - The market conditions that impact the Australian business both domestically and international including commodity prices and the USD exchange rate
 - Competition for milk in the regions where Fonterra operates
 - Optimal product mix across Fonterra manufacturing facilities including costs and efficiencies
 - The monthly minimum prices also take into account the variation in cost of milk production across the season and provide choice to enable suppliers to produce milk that is suitable for their farming system
 - Evolving market conditions and their impacts on price throughout the season.



Acting in Good Faith

- The Dairy Code requires parties to negotiate and exercise their rights honestly, reasonably and not arbitrarily or for some irrelevant purpose.
- When considering whether one's conduct is in good faith, potential questions to ask include the following:
 - Have you acted honestly with the other party?
 - Have you appropriately considered the consequences of your conduct for the other party's interests?
 - Have you made decisions without unreasonable delay?
 - Do you have a contractual or other legal right to act in that way?
 - Are you imposing any conditions on the other party that are inappropriate, unreasonable or for an ulterior purpose?
 - Are you acting in a way that undermines or denies a benefit from a milk supply agreement to the other party?



Milk Supply Agreements: Transparency

Australia Full Season Net Pay



AUS \$ Per Kilogram Milk Solids; For 2021/2022 Season as of June 21, 2021; Milk2Market

- All Milk Supply Agreements must be made publicly available
- All payment conditions must be specified in writing and available to all eligible producers
- Based on publicly available data, producers can compare how much they would get paid by different processors.

MSA: Exclusivity & Volume Limits

- Milk processors may offer Exclusive and/or Non-Exclusive Milk Supply Agreement options.
- Under Exclusive MSA option, producers are prohibited from selling to another processor, but the buyer is not allowed to impose volume limits, or two-tiered pricing.
- Under Non-Exclusive option, producers may have volume limits, but are allowed to sell to another processor.
- No processor is allowed to require both exclusivity and volume limits.



Australia Advantages & Challenges

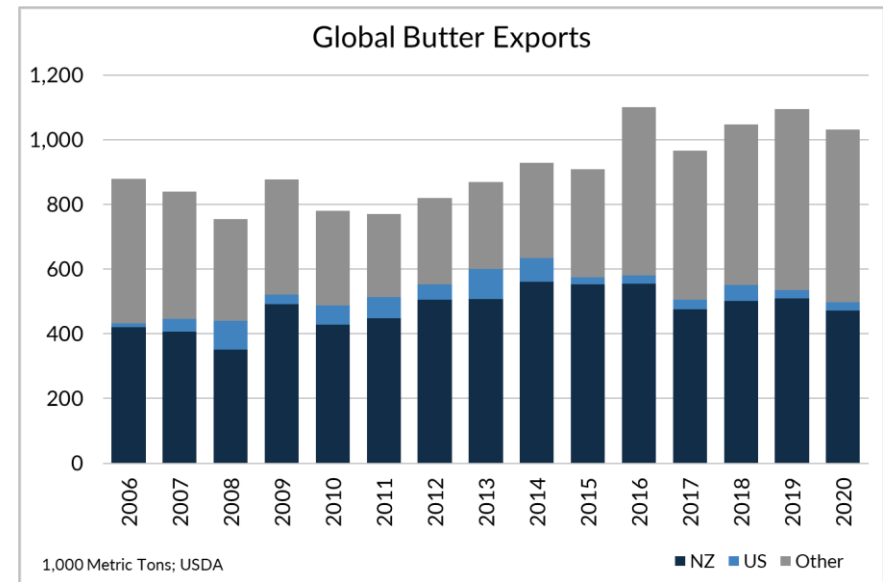
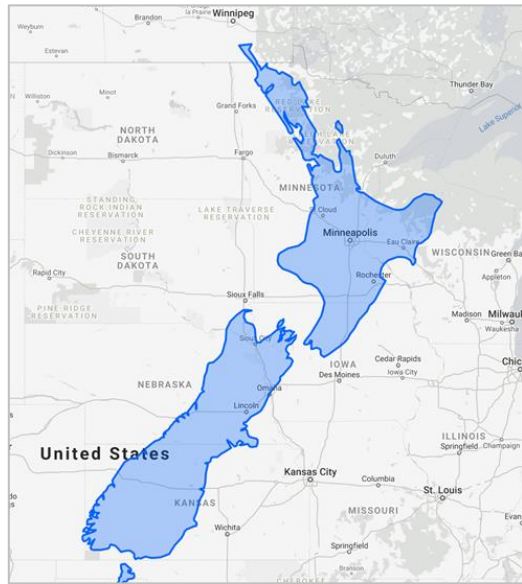
ADVANTAGES

- **Improved transparency and visibility.** All MSAs must be publicly disclosed at the start of the season, allowing time for producers to consider their options where they have the choice or more than one processor – which is in most circumstances. This effectively enables scope for greater choice for producers with improved awareness of the options at their disposal.
- **Increased certainty of terms and conditions.** This gives producers greater confidence of their outcome over a season.
- **Improved fairness in the treatment of certain incentives and notification of price changes in adverse market conditions.**

CHALLENGES

- **Novel pricing regulation.** Dairy Code of Conduct was introduced in 2020. Only two milk production seasons have been priced under this regulation so far. Long-term effects remain to be seen.
- **Complexity in MSAs.** Detailed analysis required for comparing milk prices across processors.
- **Pressure on processor budgeting and planning.** This is especially true for processors exposed to exports/commodity markets
- **Limited risk management tools.** Lack of industry coalescence around benchmark pricing implies that risk management instruments (e.g. futures market) would be difficult to create and would likely have high basis risk

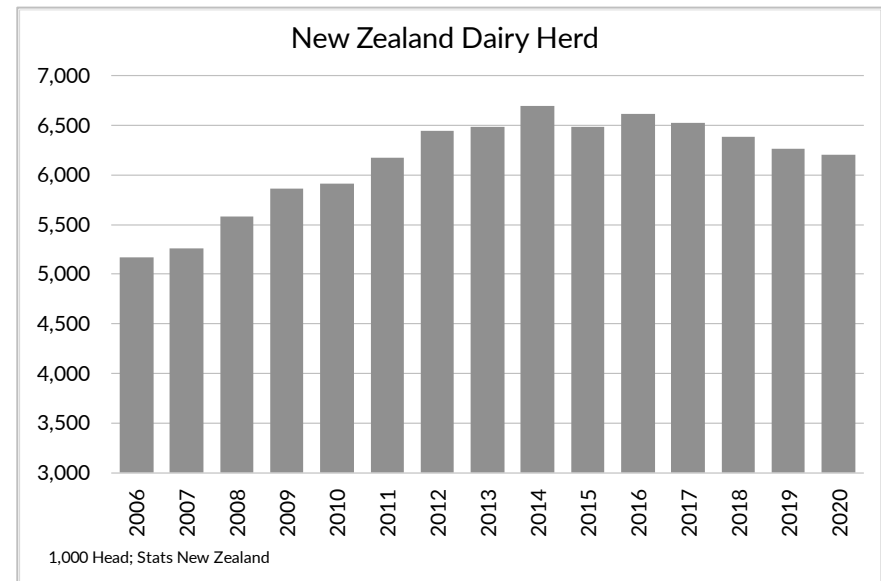
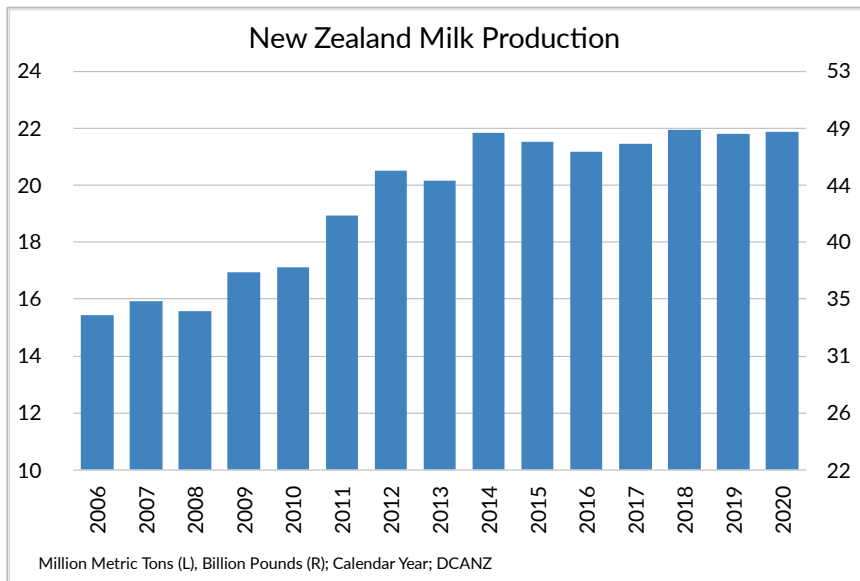
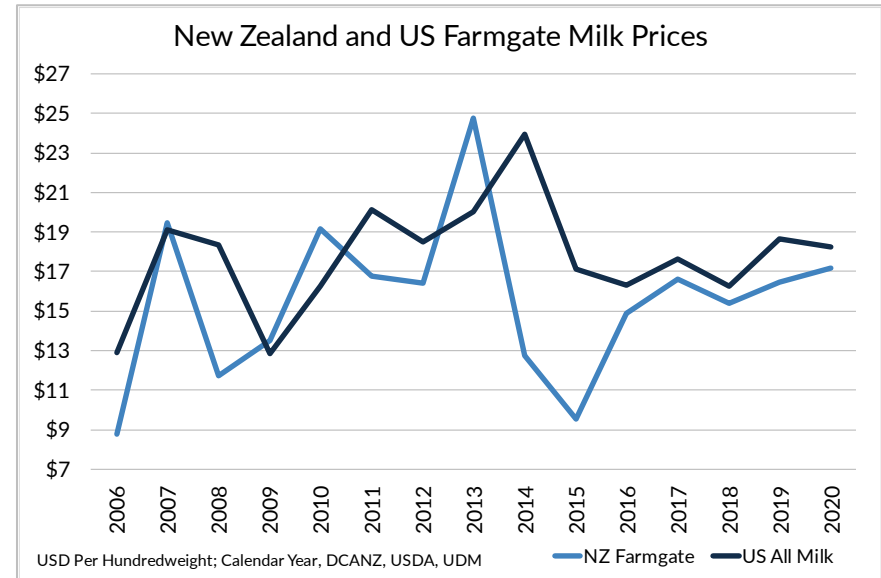
Country Profile: New Zealand



- New Zealand milk production is roughly 21% of US annual output, with predominantly pasture-based milk production systems. The North Island accounts for the majority of milk production.
- Fonterra, a cooperative, is the primary processor, with about 80% processing share.
- New Zealand is the largest global dairy exporter, with over 95% of milk value shipped abroad. That represents over one-third of global world dairy trade share on milk equivalent basis.
- Whole milk powder is the key export product, with China the biggest customer. New Zealand WMP exports represent close to 75% of world WMP trade.
- The Dairy Industry Restructuring Act (DIRA) represent the main government regulations.

Price and Production Trends

- New Zealand farmgate prices tend to be lower than those in the US . From 2016 through 2020, New Zealand prices averaged \$16.12 per hundredweight compared to \$17.42 in the US (-7%).
- Milk production has leveled off in the past five years.
- New Zealand producers have lower production costs due to pasture system.



Dairy Industry Restructuring Act

- Challenges and Opportunities:
 - New Zealand's milk production potential vastly exceeds its domestic demand for fluid milk and dairy products.
 - Competition is insufficient for farmgate milk price to be freely established using supply and demand.
 - How to stimulate innovation within the dairy processing sector, while ensuring that milk producers are provided fair compensation and appropriate signals to increase or reduce milk production?
- Dairy Industry Restructuring Act of 2001 was the answer, with focus on:
 - Promoting export orientation of NZ dairy sector.
 - Promoting competition, by requiring non-exclusive milk supply agreements for all Fonterra producers.
 - Requires end-product pricing approach for Fonterra's farmgate milk price.

Why Regulate Farmgate Price?

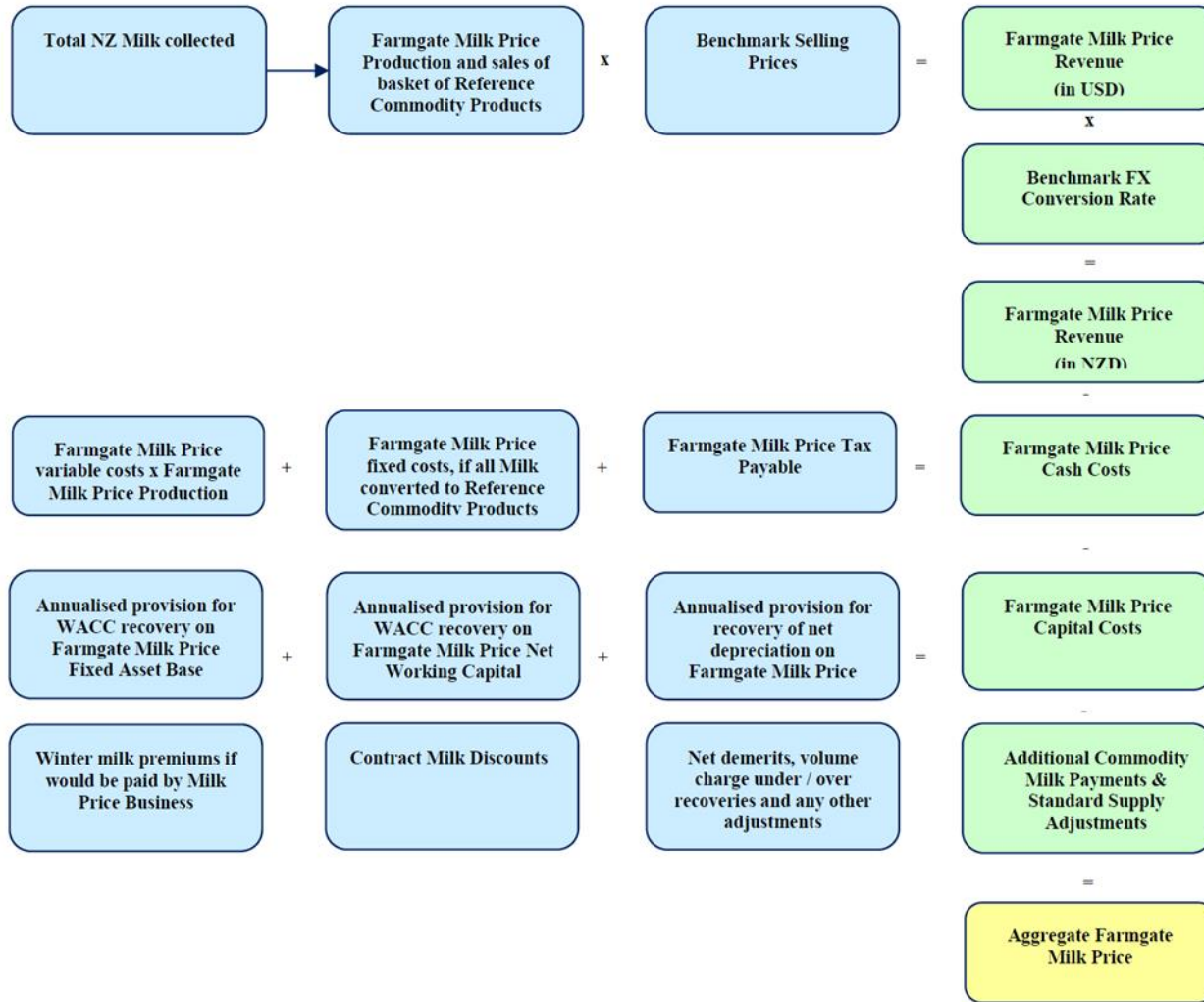
- If a dominant cooperative is not regulated:
 - Cooperative leadership can blame the market for poor management decisions and substandard business performance, i.e. decrease farmgate milk price to keep dividend positive.
 - Dominant cooperative may stifle competition:
 - By imposing high barriers to entry/exit to its producer-owners.
 - By exerting market powers on other milk buyers, i.e. charging high selling price for raw milk.



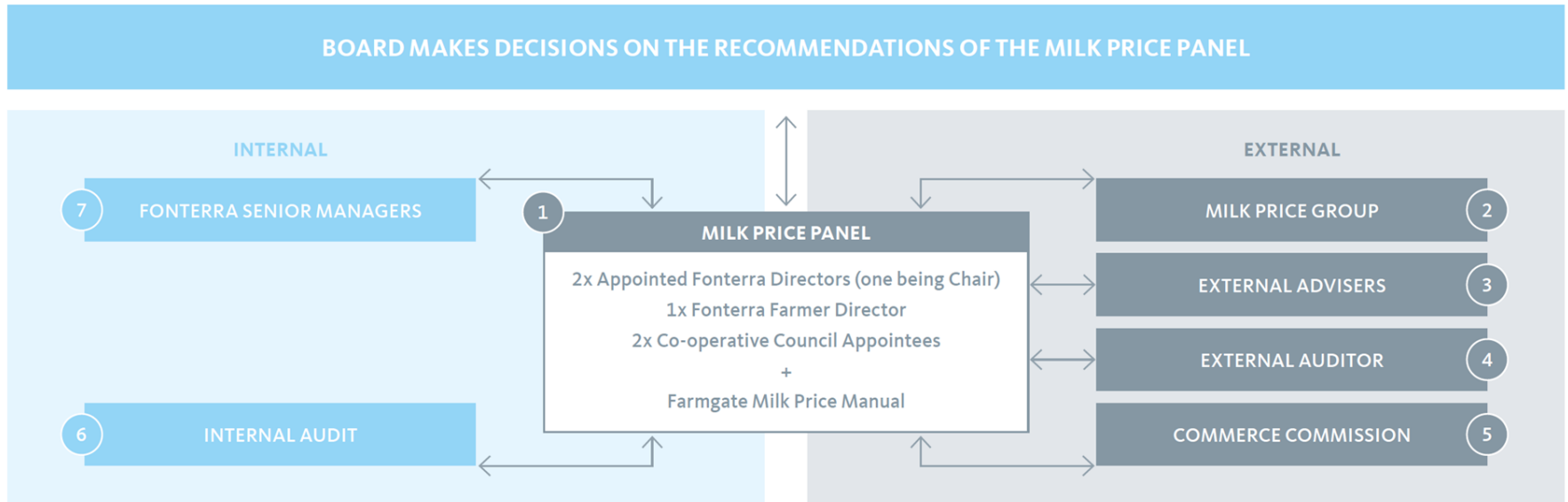
Fonterra Farmgate Milk Price

- Detailed end-product pricing approach.
- Based on returns to converting milk to commodity dairy products:
 - Skim milk powder
 - Whole milk powder
 - Butter and anhydrous milkfat
 - Buttermilk Powder
- Governance structure provides for regular review of the farmgate pricing model:
 - Annual (or more frequent) review of assumptions regarding fast-changing cost categories, e.g. variable costs.
 - Every four years, review of assumptions regarding milk conversion parameters, i.e. manufacturing yields, plant technology
 - Inter-year forecast updates on season-average farmgate milk price, based on commodity price changes.

Fonterra Farmgate Milk Price



Fonterra Milk Price Governance



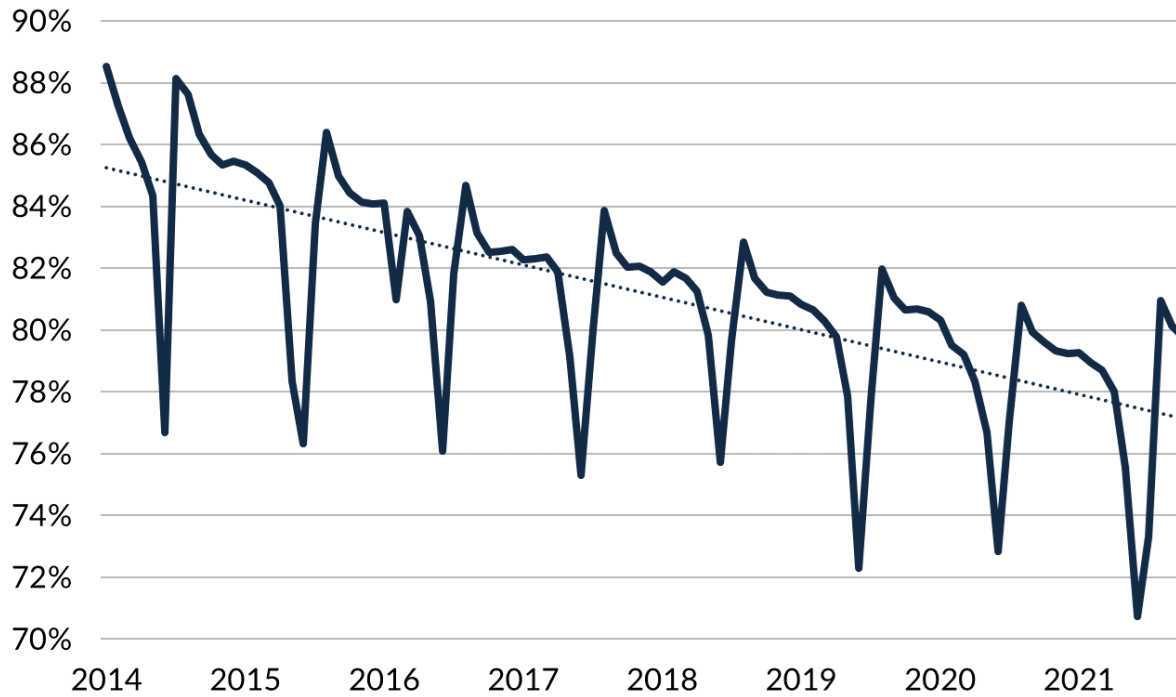
- Milk Pricing Group – a group of experts maintaining very detailed, non-public, engineering models of Standard Plants, used to derive capital and variable costs of conversion.
- Milk Pricing Panel – a panel comprising of Fonterra employees and external advisers and government officials, who make recommendation to the Fonterra board regarding the appropriate Farmgate Milk Price.
- Fonterra Board of Directors – makes final decision on the Farmgate Milk Price

Fonterra Risk Sharing Policy

Item	Allocation
International and Foreign Exchange Risks	International Commodity Product prices and exchange rates should pass through to the Farmgate Milk Price as suppliers have better incentives and capabilities to manage these risks (in the short-run by altering feed and milking practices, and in the long-run by substituting alternative land uses).
Fonterra Sales Phasing	Fonterra should bear the financial consequences of carrying stock beyond a practicably feasible competitive benchmark, as it has better information and capability through its day-to-day involvement in the markets to manage this risk, and should face strong performance incentives around sales strategy and implementation.
Fonterra's Contract Position	For the same reason, Fonterra should bear the financial consequences of Fonterra entering into forward contracts with an average term beyond competitive benchmarks.
Relative Price Risk Across Different Product Streams	Fonterra should bear the financial consequences of adopting a Product Mix different from a competitive benchmark, as it is better able to manage this risk through having both better information than suppliers, and a capability advantage through its ability in the short-run to alter product mix, and in the long-term through plant investments.
Changes in Industry Costs	While Fonterra has an advantage in understanding industry-wide manufacturing costs, suppliers have better capability to manage the impact on returns by changing feed, milking practice and land use. Accordingly, changes in industry costs should pass through to the Farmgate Milk Price but with performance incentives on Fonterra.
Fonterra-Specific Costs	Fonterra has the best information and capability to manage cost variances against an efficient near-term rival, and thus should bear the financial consequences of costs exceeding an efficient rival's costs. The Farmgate Milk Price should provide incentives for Fonterra to minimise costs and to invest appropriately in processing quantity and quality. Costs in this context include costs of downgrade product or product that otherwise does not meet quality standards.
Temporary Supply Risks	Both Fonterra and suppliers have the capability and incentives to respond to temporary reductions in milk supply; accordingly, costs of lower fixed-cost recoveries and temporarily stranded assets should 'lie where they fall'.
Permanent Supply Shocks	International price impacts should flow through to suppliers (as noted above) while costs associated with permanently stranded assets should fall on Fonterra. Other costs should lie where they fall.
Receivables Risk	Receivables risk is most readily managed by Fonterra. Accordingly, actual bad or doubtful debts should generally not affect the Farmgate Milk Price.
Fonterra Pricing Performance Relative to Market	Fonterra should bear the financial consequences of any difference between prices Fonterra is able to achieve compared to market benchmarks, as it is best able to manage this risk.

Competition, Efficiency & Innovation

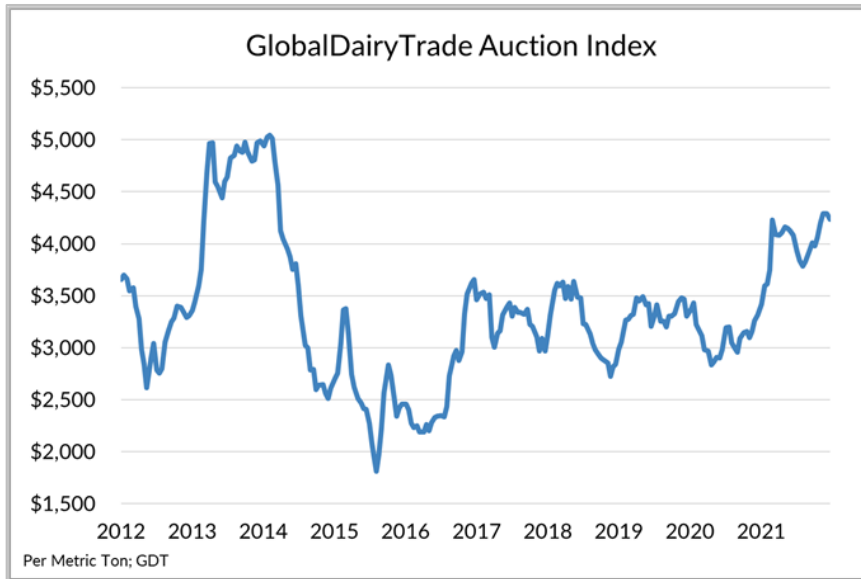
Fonterra Estimated Share of NZ Solids Processing



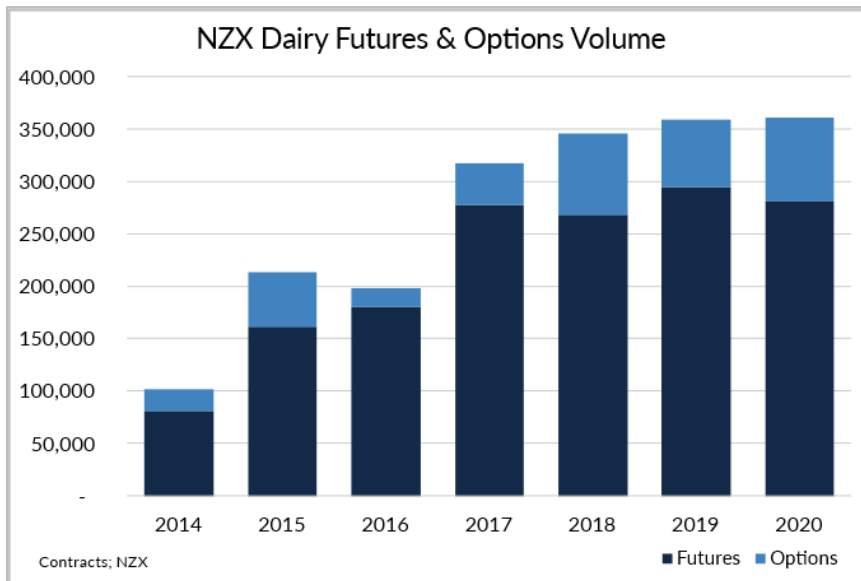
Fonterra, DCANZ, Bozic

- Producers must be free to enter and exit the cooperative as they wish.
- Shareholders can sell up to 20% of weekly collections to other milk buyers.
- Fonterra must be willing to sell a limited amount of raw milk to other milk processors at a price that is related to the Farmgate Milk Price.

Price Discovery & Risk Management



- GlobalDairyTrade launched in July 2008 as an online auction place for price discovery and commerce.
- Sessions conducted bi-monthly. Results flow through to producer pay prices.
- Regulated process for determining Fonterra milk price enables the creation of risk management tools, such as Milk Price Futures.
- The NZX launched dairy futures and options contracts in 2010. After an initial growth spurt, volume has plateaued in recent years.



Comparing US & NZ End-Product Pricing

NEW ZEALAND/FONTERRA

- Variable costs reviewed at least annually. Detailed engineering models on standard plants are maintained and updated at least every 4 years.
- Changes in product mix (e.g. SMP to WMP and vice versa) due to changing market circumstances accrue to Fonterra as earnings, incentivizing efficiency, agility and spare capacity needed for flexibility. Cheese not part of the benchmark commodity set.
- Farmgate price is set for the season and updated periodically as markets change.
- Long-term supply contracts affect farmgate price.
- Beverage milk price not regulated.

UNITED STATES/FMMO

- Make allowances not modified for over a decade, process for updating does not allow for regular maintenance of the model.
- No attempt to define a standard plant – make allowances based on voluntary surveys.
- Changes in utilization mix (e.g. from NFDM to cheese) require all gains from trade to be paid to dairy producers. This creates disincentives for flexibility and spare capacity.
- FMMO prices are set monthly, based on spot and near-spot sales. Processors bear the risk of long-term contracts.
- Beverage milk price at the heart of FMMO regulation.

New Zealand Advantages & Challenges

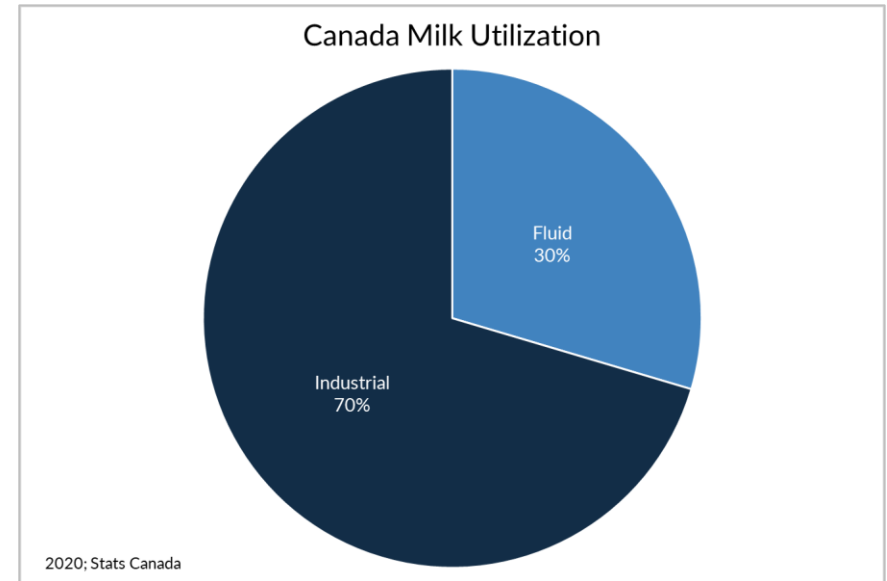
ADVANTAGES

- **Fair treatment among producers.** Regulated system in DIRA offering fair treatment for all producers.
- **Reasonable process for separating commodity- and value-added returns.** Farmgate price determination process incentivizes value-added investment and profit-seeking business model, while providing for sufficient processing capacity to facilitate any desired growth by NZ milk producers.
- **Risk management.** Futures/options markets provided by SGX can provide opportunities for forward pricing.
- **Transparent.** GDT auction provides a strong price discovery system that can be seen by all market participants.

CHALLENGES

- **Much of the recent significant investment in additional processing facilities has been financed by working capital rather than longer term borrowings.** This strategic decision has meant a lower milk price in the short term with benefits in the longer term.
- **Limited competition.** Only two large processors.
- **Limited natural resources.** New Zealand is an island, with limited ability to further grow milk supply using grazing-based production models.

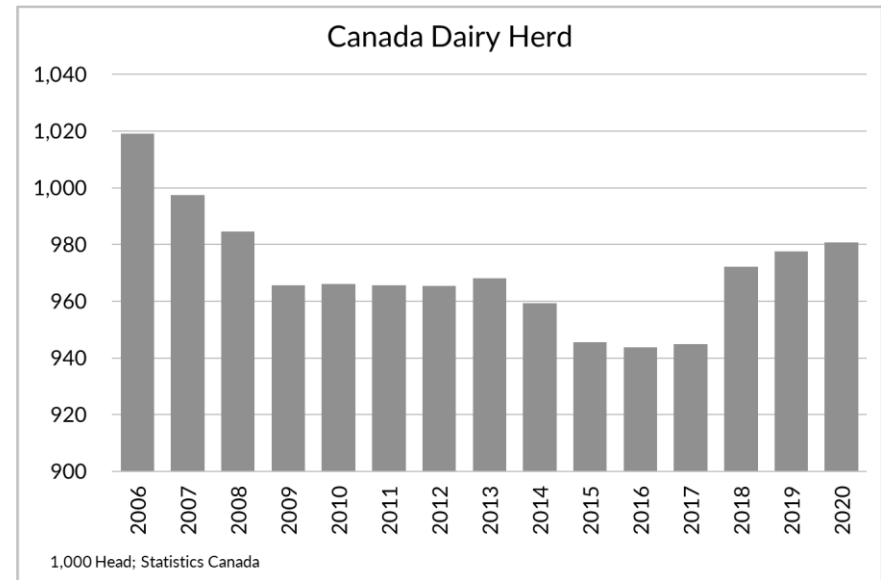
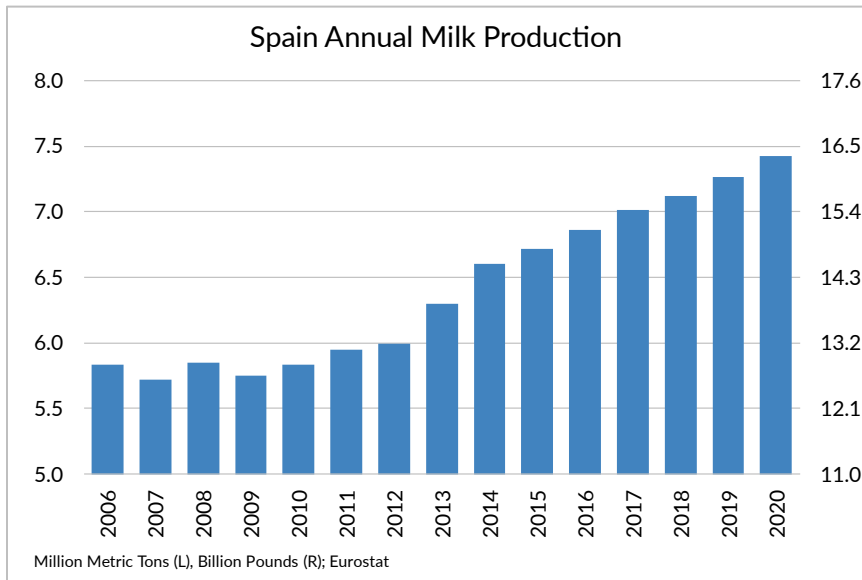
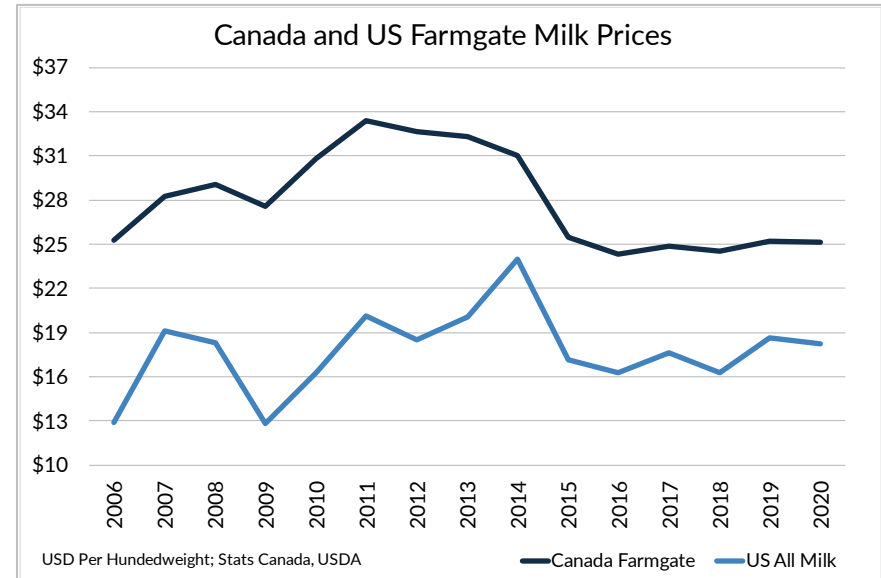
Country Profile: Canada



- Canada milk production adds up to a little less than 10% of US annual output, with a quota system controlling supply.
- Most milk is produced in the Ontario and Quebec provinces of Eastern Canada.
- Canada is an exporter of SMP and MPC, but overall, it is a net importer of most other dairy products. Canada has import protections in place on most dairy products via tariff quotas.
- Canada farmgate milk prices are substantially above global averages.
- The Canadian Dairy Commission manages the quota system and prices.

Price & Production Trends

- Canada farmgate prices tend to be much higher than those in the US . From 2016 through 2020, Canada prices averaged \$24.80 per hundredweight compared to \$17.42 in the US (+42%).
- After holding steady under 8 million metric tons for several years through, milk production increased 20% from 2014 to 2020.
- Cow numbers rebounding, too.



Canada: Supply Management

- Dairy farmers must own quota to sell milk to processing plants. Processors collect all the milk farmers wish to supply, but processors only need to pay volume covered by quota.
 - Any revenue for milk delivered over quota is shared among all dairy farmers in a province.
- The Canadian Milk Supply Management Committee is the key body for policy development, oversight and discussions.
- The Committee meets four times yearly to examine main production, economic and marketing factors affecting the dairy industry, including:
 - Domestic consumption trends;
 - Production of milk and dairy products;
 - Butter stocks held by the Canadian Dairy Commission and by the industry;
 - Export market activities.
- Committee approves quota and allocates it to provinces.

Quota Statistic	Value
Total Quota 2020/21 (MT kg butterfat)	397,919 MT kg butterfat
Total Quota Milk Equivalent (4.17% bf)	21.03 billion pounds
Weighted Avg. Quota Price in Oct 2021	\$22,158 USD per kg of bf/day
Average Quota Value Per Cow	\$25,699 USD per cow
Total Quota Value in 2021	\$24.15 Billion USD
Average quota value per cwt	\$114.83 USD/cwt

Supply Management Impacts

Factor	Canada	US
Number of farms in 2020	10,095	31,657
Reduction in farm numbers since 2007	-28%	-46%
Average farm size in 2020	94 cows	273 cows
Cost of production in 2020 (USD/cwt)	\$29.34/cwt	\$18.50/cwt
Retail milk price USD/gal (2020)	\$4.75	\$3.31
Fluid milk per capita consumption (gal/year)	16.98	16.40

- Canadian dairy farms are smaller than U.S. dairy farms. Indeed, 67% of barns in Ontario and 90% of barns in Quebec are tie stall. There are only a few farms with more than 1,000 cows.
- Average annual dairy farm exit rate in Canada is 2.4% vs. 4.6% in United States.
- Cost of production in Canada are more than \$10.00/cwt higher than in the US.
- Retail price for fluid milk is 43% higher in Canada than in the United States.
- Comprehensive trade barriers that protect domestic producers and milk prices that exceed world benchmarks limit Canada's ability to export via trade agreements such as USMCA.

Classified Pricing & Mandatory Pooling

Ontario/Quebec Prices for 2021/22	Butterfat USD/lb	Protein USD/lb	Other Solids USD/lb	Class Milk Price Equivalent*
1a - Beverage Milk	\$2.9967	\$26.97		\$36.52
1b - Cream	\$2.9967			
2a - Yogurt	\$3.3780	\$1.8951	\$1.8951	\$28.28
2b - Ice Cream, Sport Drinks	\$3.3780	\$2.1006	\$2.1006	\$30.07
3a - Ricotta, Other Cheese	\$3.3780	\$4.6965	\$0.0000	\$25.87
3b - Cheddar, Cream Cheese	\$3.3780	\$4.5531	\$0.0000	\$25.44
3c - Feta, Mozzarella, Gouda, etc.	\$3.3780	\$4.4729	\$0.0000	\$25.20
3d - Mozzarella for Restaurant Pizza	\$3.3780	\$2.8960	\$0.3156	\$22.28
4a - Butter, Milk Powders	\$3.3780	\$1.1217	\$1.1217	\$21.57
4b1 - Concentrated Milk for Retail	\$3.3780	\$1.3448	\$1.3448	\$23.50
4b2 - Other Products	\$3.3780	\$2.1220	\$2.1220	\$30.25
4c - New industrial products				
4d - Inventory	\$3.3780	\$2.0832	\$2.0832	\$29.92
5a - Cheese Used as Ingredient	\$2.1120	\$2.6998	\$0.3872	\$17.67
5b - Other dairy as Ingredient	\$2.1120	\$1.2707	\$1.2707	\$18.43
5c - Dairy Ingredients in Confectionary	\$2.5327	\$1.2707	\$1.2707	\$19.90

- Similar to United States, Canada uses as system of classified pricing and revenue pooling. Unlike the US, pooling is mandatory, and majority of prices are set annually and differ across provinces.

Classified Pricing & Mandatory Pooling

- Canada maintains five main milk classes within the Harmonized Milk Classification System.
- Prices are published for butterfat, protein, other solids, and for beverage milk – skim milk price. Prices differ regionally, with four milk pools: Western, Quebec/Ontario, Nova Scotia/New Brunswick, and Newfoundland/Prince Edward Island.
- Prices are also differentiated within classes, resulting in 32 different subclasses.
 - For example, Class 3 covers cheese. It is subdivided to 3a – lowfat cheese, 3b – cheddar and cream cheese, 3c – various cheeses, and 3d – fresh mozzarella used in restaurants. However, within the subclass 3c, prices for protein are further differentiated by cheese type: 3(c)1 – Feta, 3(c)2 – Asiago, Gouda, Havarti, Parmesan, Swiss, 3(c)3 – Munster, pizza cheese, 3(c)4 – Brick, Colby, Jack, etc., 3(c)5 – Pizza Mozzarella, 3(c)6 – Paneer. Price for protein used in Gouda is ~50% higher than the price of protein used in Feta.
- Most prices are determined annually, but prices for some classes are updated monthly – notably, for solids nonfat used in milk powders, and for milk converted to dairy ingredients (for example, in the confectionary industry, etc.)
- Similar to FMMOs, pooling revenues from milk sales enables producers to receive an average price per hectolitre or per kilogram of components, based on total sales.
- Under the Special Milk Class Permit Program (Class 5), industrial milk destined for the manufacture of dairy products and products containing dairy ingredients is sold at competitive prices and these prices vary according to the end use. Through the Comprehensive Agreement on Pooling of Milk Revenues, all dairy farmers across the country share the returns from the sales of special milk classes and markets.

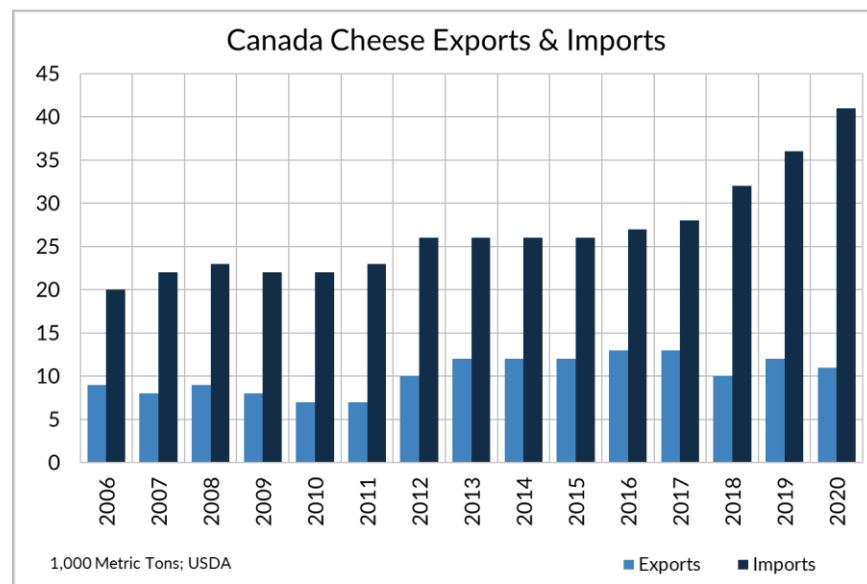
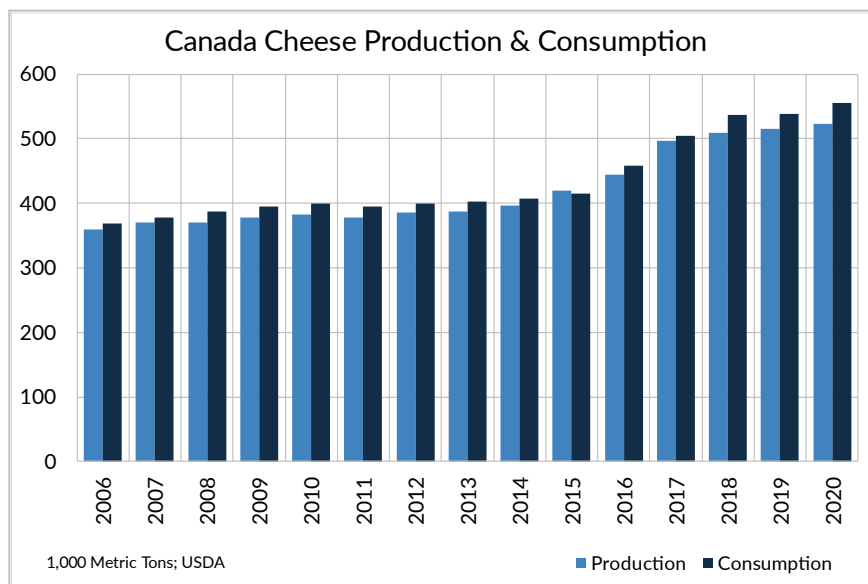
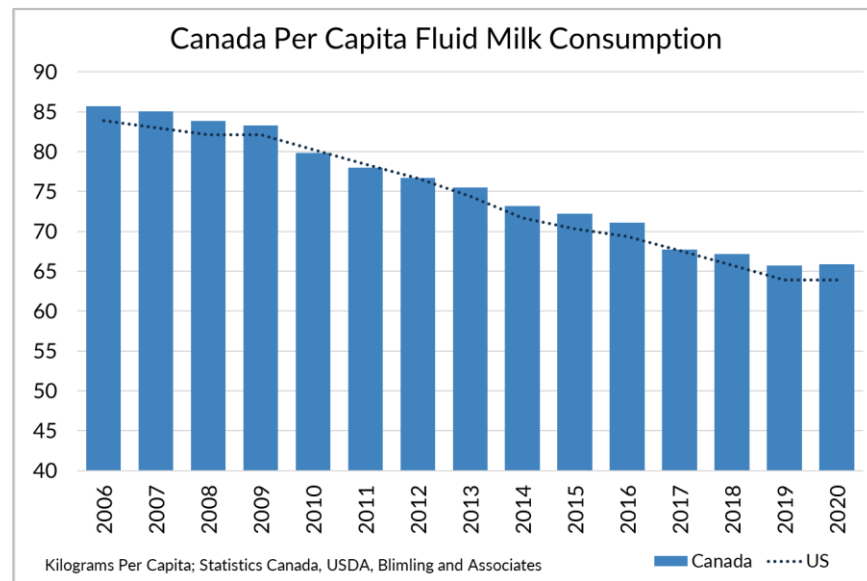
Price Discovery & Updating

Factor	2020 COP	2019 COP	Change (\$/cwt)	Change (%)
Cash Costs	16.72	15.93	0.80	+5.0%
Capital Costs	5.52	5.47	0.05	+0.8%
Labor Costs	6.84	6.85	-0.02	-0.2%
Government Rebates & Others	-0.19	-0.14	-0.05	+36.4%
Total COP	28.55	28.11	0.44	+2.8%

- Skim milk and milk component prices for milk used in beverage and soft dairy products, cheeses and butter are set annually.
- Prices are adjusted vs. previous year based on a formula:
 - Price adjustment in % = (50% of the variation in the cost of production) + (50% of the consumer price index)
- Canadian Dairy Commission undertakes annual Dairy Cost of Production Study.
- Price of solids nonfat used in milk powders is updated monthly, based on a yield formula similar to FMMO:
 - Class 4(a) SNF = (USDA NFDM Price – Canada’s assumed processor margin) x Canada’s Yield Factor. Current make allowance is 0.325 USD/lb, nearly double the make allowance used in the United States (\$0.1678).

Canada Demand & Trade Statistics

- Canada eats more cheese than it makes.
- From 2000 to 2015, the margin was about 11,000 metric tons. Over the past five years, the gap has nearly doubled to 21,000 metric tons.
- Canada now imports more than 3x as much cheese as it exports.
- Fluid milk consumption down 16% over the past decade, similar to US (-18%).



Canada Advantages & Challenges

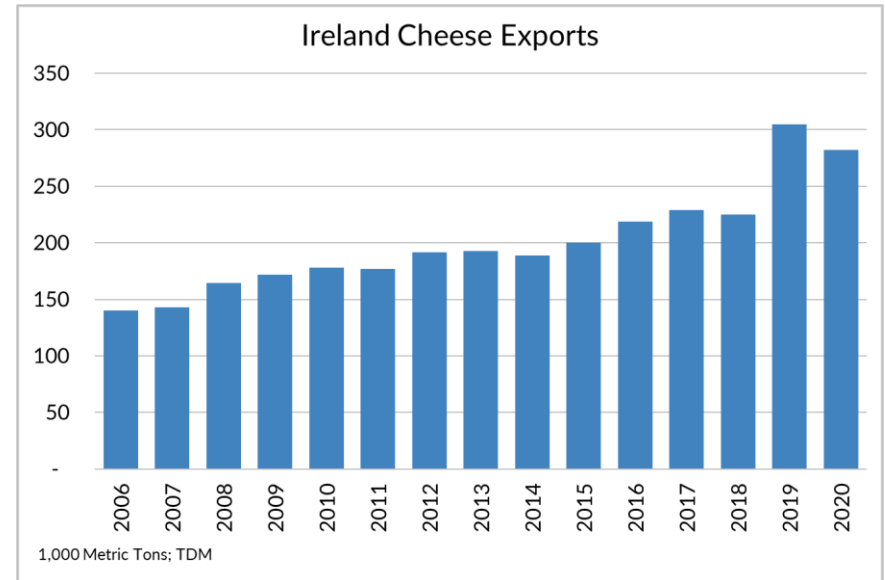
ADVANTAGES

- **Retail price stability.** Dairy processors serving domestic market face stable input costs.
- **Consolidation and retirements.** Quota value serves as an asset which can be sold upon retirement. Annual price updates partially based on weighted average cost of production allow dairies of average efficiency reasonable odds of consistent profitability.
- **Strong processing sector invests overseas.** Strong profitability in domestic market has allowed Canadian dairy processors to invest in US and other countries.

CHALLENGES

- **Dairy consumers pay the price.** Retail prices in Canada are substantially higher than US prices. Fluid milk buyers bear the brunt of high Class 1 prices.
- **Slow adoption of efficient methods of production.** Quota constrains producers who are growth-oriented. The ability to grow is inhibited and less investment is seen in improving efficiencies.
- **Limited ability to participate in export markets.** Canadian prices are higher than the world market, and only limited exports of commodity products (milk powders) are allowed under existing trade agreements.

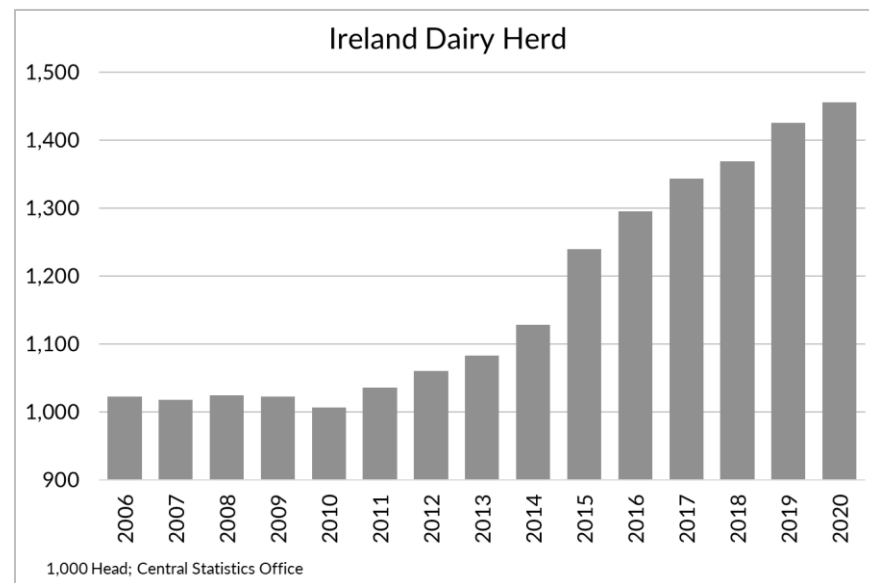
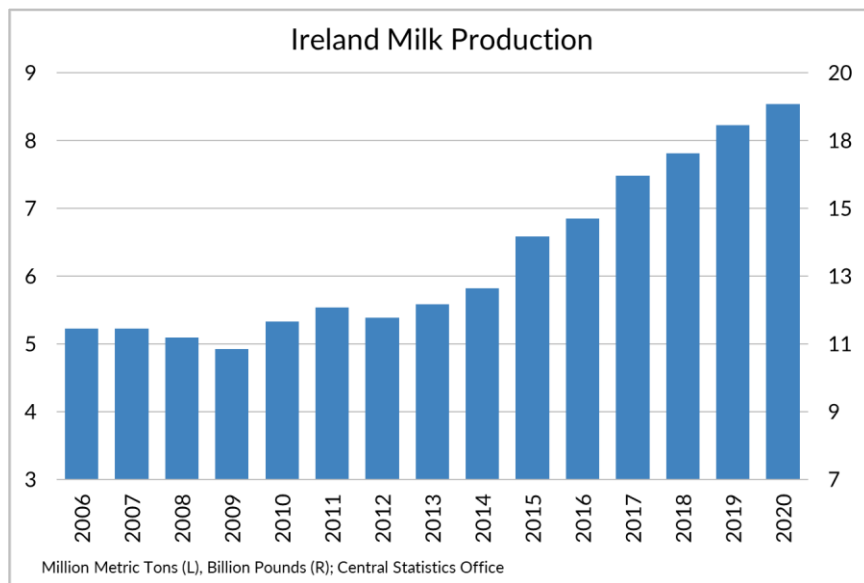
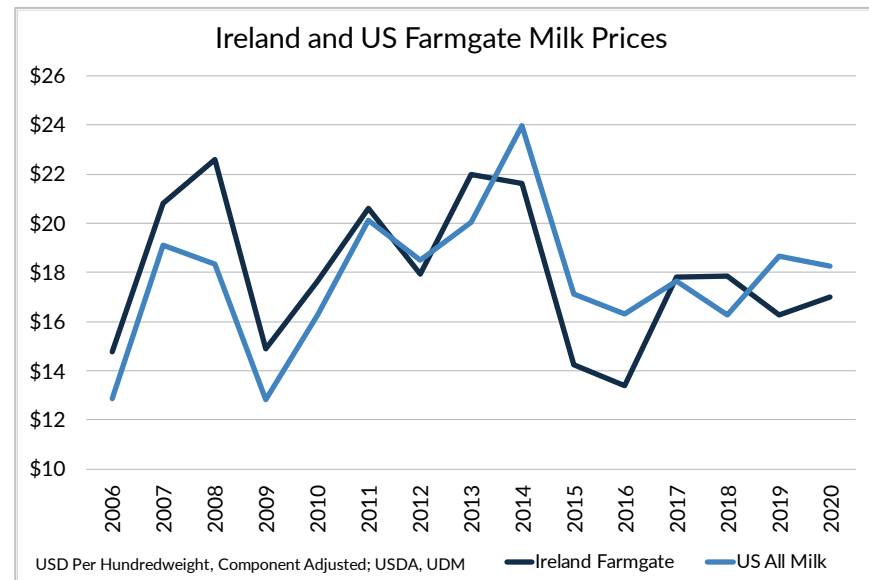
Country Profile: Ireland



- Ireland milk production is a little less than 9% of US annual milk production.
- Predominantly pasture-based, with highly seasonal output.
- Heaviest milk production concentration is in the Southern half of Ireland.
- Ireland is a significant global dairy exporter, with roughly 50% to 60% of production shipped out of the country on milk equivalent basis, putting Ireland just inside the global top 10.
- Overall milk production growth has accelerated since the removal of EU milk quotas in 2015.
- Ireland has no national legislation governing milk prices, but the EU Unfair Trading Practices Regulations in 2021 dictate some terms between farms and processors

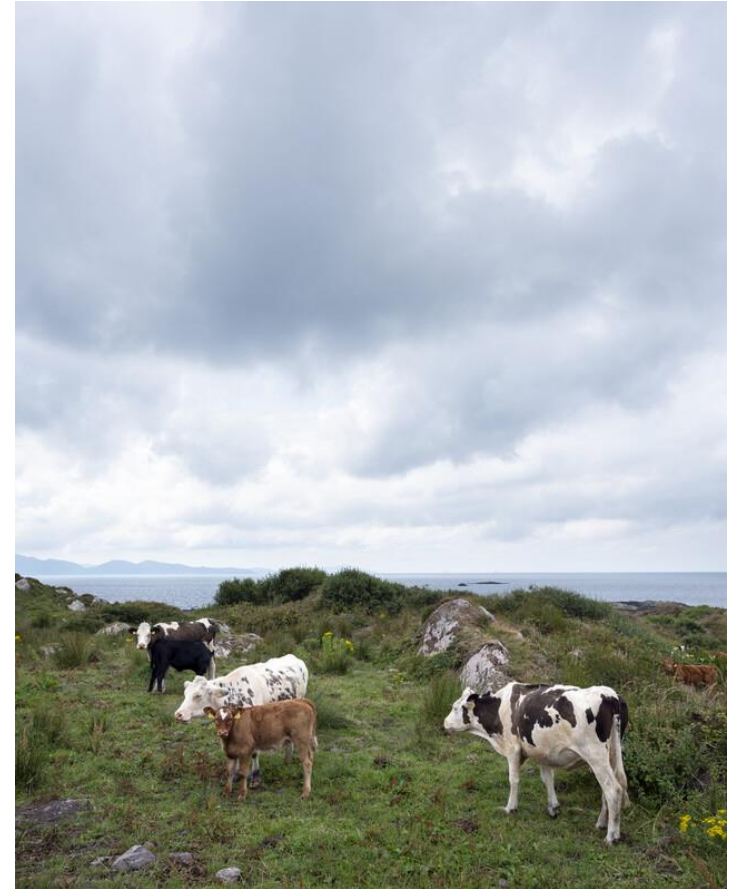
Price & Production Trends

- Ireland farmgate prices tend to be lower than those in the US. From 2016 through 2020, Ireland prices averaged \$16.47 per hundredweight compared to \$17.42 in the US (-5%).
- Ireland's dairy cow inventory expanded rapidly post 2014 in response to EU quota removal, resulting in a major expansion in milk production that primarily is destined for export markets.



Ireland: Unregulated Milk Pricing

- The main milk processors pay for milk on an A plus B minus C basis (A+B-C), where A is the price paid per kilogram of protein, B is the price paid per kilogram of fat and C is a processing cost deduction.
- Processors then add or subtract from a series of bonuses and penalties, grouped around quality and other criteria. These bonuses/penalties vary from processor to processors, and they can differ substantially from month to month.
- Cooperative boards – with significant farmer representation – typically establish prices monthly.
- All farmers are treated equally with regards to milk price within a processor.
- Each processor publishes its monthly milk fat, milk protein valuations and processing cost deduction along with bonuses and penalties. So, with a large degree of accuracy, farmers can monthly determine what they would have received from other processors.



Milk Payment Principles

- Payment principle is based on components and various quality metrics including:
 - Somatic cell count (SCC) levels
 - Total bacterial count (TBC)
 - Thermoduric
 - Low milk lactose content and sediment
 - incentive milk production during the non-peak (shoulder months and winter milk)
 - Pay sustainability bonuses,
- Some bonuses are non-specific and seen as a top up or additional payment to mitigate the effects of harsh weather or poor milk prices and paid from reserves.
- Handlers add a flat rate of Value Added Tax (VAT) to the agreed upon price paid to farmers. Currently this rate is 5.6%.



Milk Price Publication

Ireland: October 2021 Prices						
Cooperative	A €/kg protein	B €/kg fat	C Volume Adjusted	Maximum Attainable Price	Bonuses	Price
				3.3%/3.6% including VAT		3.3%/3.6% including VAT
Arrabawn	€7.49	€3.70	3.35	38.00	0.21	37.79
Aurivo	€6.82	€4.45	3.81	38.11	0.22	37.89
Bandon	€6.76	€4.51	4.00	38.21	0.53	37.68
Barryroe	€6.76	€4.51	4.00	38.21	0.53	37.68
Boherbue	€6.73	€4.48	4.00	37.46		37.46
Dairygold	€6.95	€4.25	4.00	38.00	0.69	37.32
Drinagh	€6.72	€4.47	3.55	38.40	0.53	37.87
Glanbia	€7.47	€3.73	4.00	37.00	0.42	37.18
Kerry Group	€6.65	€4.43	4.00	37.00	0.42 + 0.11	37.53
Lakelands	€7.52	€3.83	3.50	38.28		38.28
Lisavaird	€6.72	€4.47	3.70	38.24	0.53	37.71
North Cork	€6.88	€4.13	4.00	37.79	0.11 + 1	36.63
Strathroy	€7.44	€3.84	4.00	38.03	0.53	37.50
Tipperary	€6.62	€4.41	4.00	37.30	0.26	37.03

Agriland

- The Irish Central Statistics Office (CSO) publishes both monthly and annual, average milk prices for manufacturing milk delivered to dairies.
- The CSO shows average price paid for actual milk solids delivered while as well as average price paid on a 3.3% protein and 3.7% fat basis.
- Prices are also available through the EU Milk Market Observatory (MMO), The Irish Farm Journal (in conjunction with KMPG) and Agriland Media.
- Irish Creamery Milk Suppliers Association maintains an interactive web-based milk check calculator, where producers can see how much they would get paid by each processor.

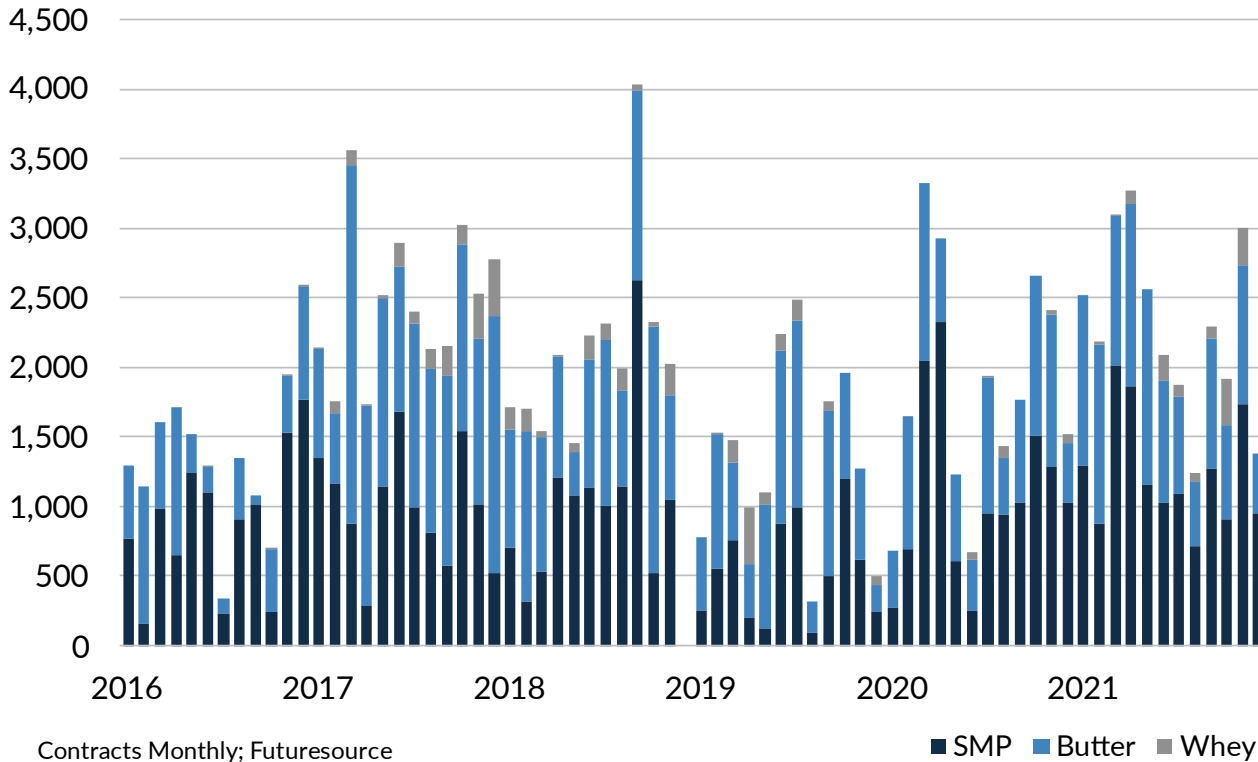
Fluid Milk in Ireland

- Roughly 95% of milk is used in manufacturing
- A number of registered producers contract to supply milk for processing for liquid consumption on a year-round basis, or for the winter months only.
- The pricing framework for these suppliers is based on monthly manufacturing milk prices, adjusted for constituents, with an additional incentive payment during the winter months.



Forward Pricing Opportunities

EEX European Dairy Futures Volume



- Since 2011 processors have offered fixed price forward milk price contracts to producers.
- Contracts vary in duration from 9 months to 3 years.
- Initially, processors back-to-backed producer contracts with customer forwards. But in recent years, one main processor, has offered fixed price forward contracts hedged via derivatives contracts traded on the European Energy Exchange (EEX).
- EEX futures do not trade actively.

EU Unfair Trading Practices

- Regulations introduced in 2021 outlaw certain practices, including:
 - Payment later than 30 days for perishable agricultural and food products
 - Payment later than 60 days for other agricultural and food products
 - Short-notice cancellations of perishable agricultural and food products
 - Unilateral contract changes by the buyer
 - Payment not related to a specific transaction
 - Risk of loss and deterioration transferred to the supplier
 - Refusal of written confirmation of a supply agreement by the buyer, despite request of the supplier
 - Misuse of trade secrets by the buyer
 - Commercial retaliation by the buyer
 - Transferring the costs of examining customer complaints to the supplier



Ireland Advantages & Challenges

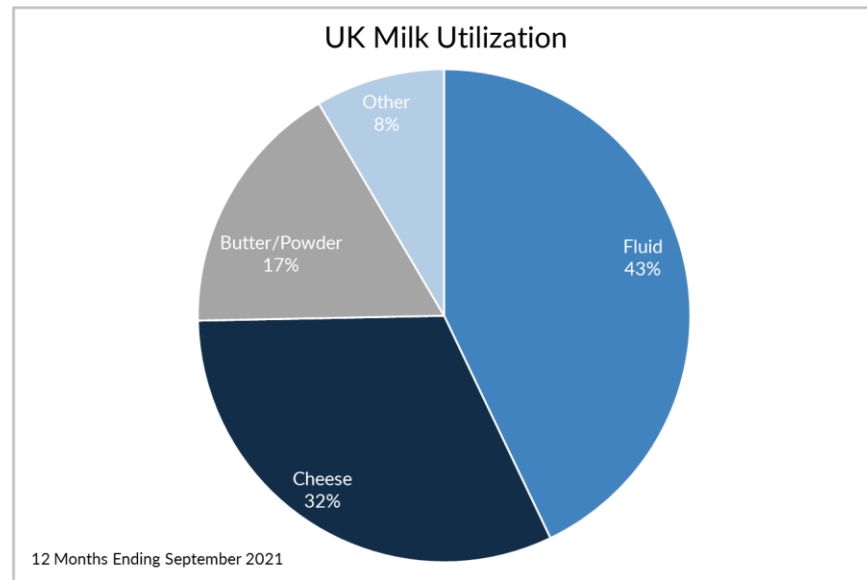
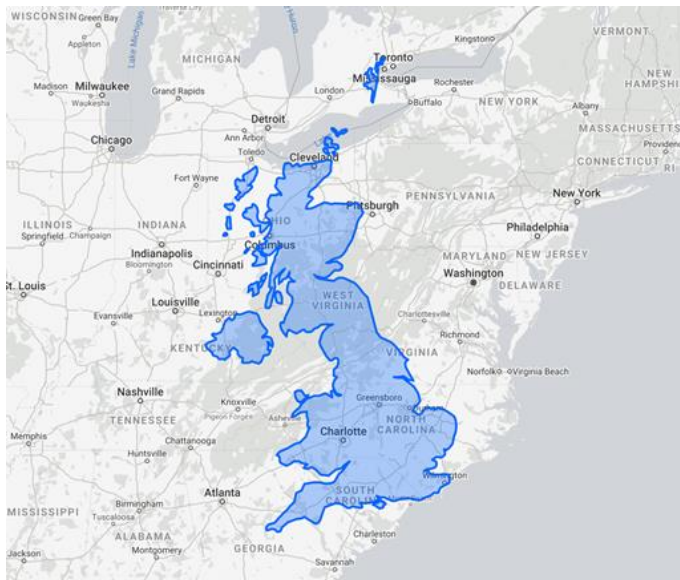
ADVANTAGES

- **Fair treatment among producers.** Each producer knows that processors calculate milk prices in the same way for all farms.
- **Top up approach enables price smoothing.** By adjusting A and B valuations, processors can reduce milk price volatility levels. This system has facilitated the introduction of fixed price forward milk contracts.
- **Clear incentives.** By increasing milk solids producers can increase their returns.
- **Transparency.** Once farmers know the price variables, calculating and comparing prices across processors is straightforward for a given level of solids.

CHALLENGES

- **Plant-to-plant price variability.** Some farmers are skeptical when they see milk solids values at one processor vary by as much as 15% relative to neighboring handlers.
- **Milk prices tend to lag commodity market returns.** This often leads to frustration as it sometimes appears that processors withhold favorable price increases.
- **Processors increasingly finance processing investments using working capital instead of debt.** This strategic decision has meant lower milk prices in the short term with benefits in the longer term
- **Deciphering milk checks can be difficult.** Some farmers are unable to interpret the information and make comparisons with their peers supplying other processors.

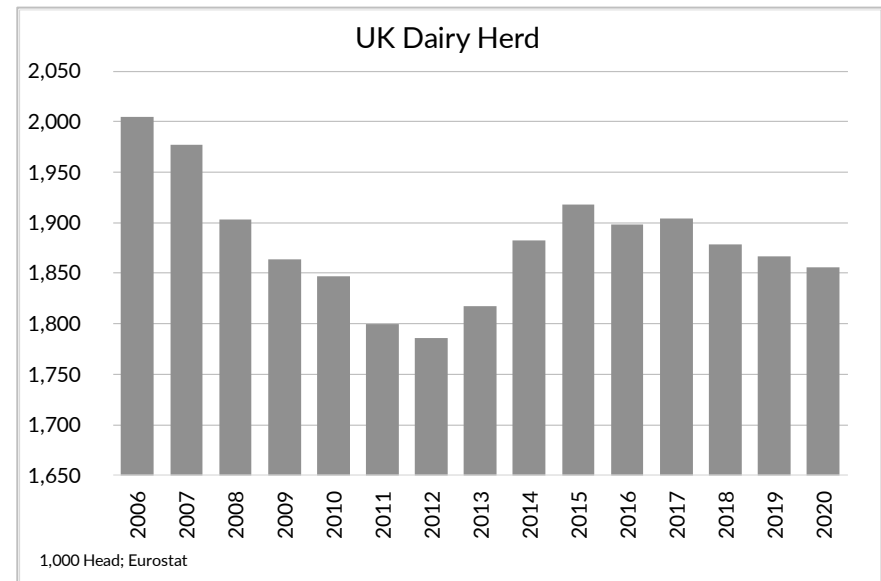
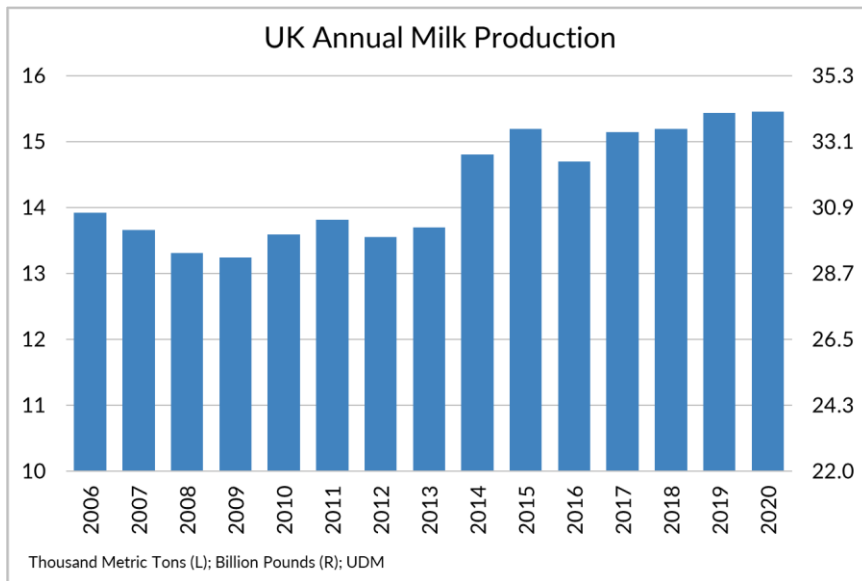
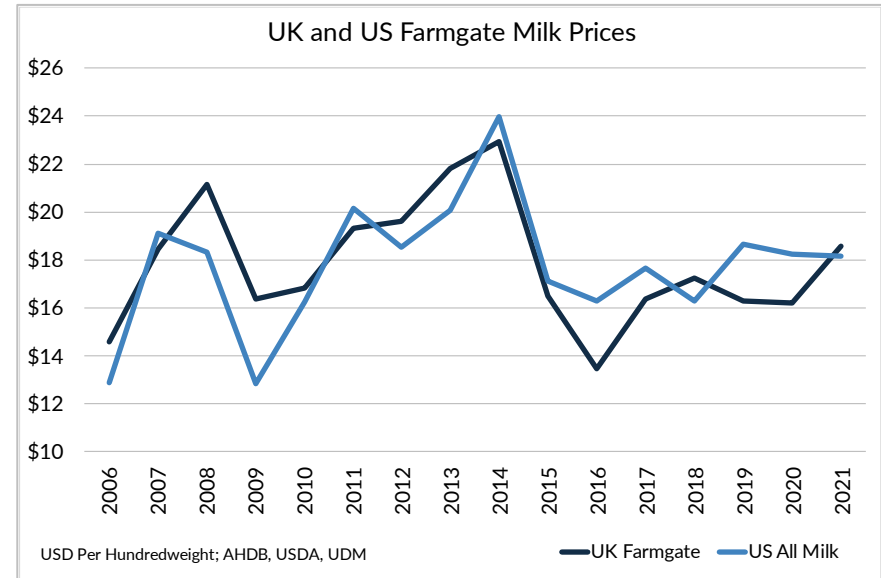
Country Profile: UK



- United Kingdom milk production is roughly 15% of US annual milk production. Roughly 43% of milk is used for fluid purposes, roughly 32% is used in cheese, and the rest is butter/powder manufacturing mostly.
- The UK is a modest global dairy exporter, with roughly 25% of production in milk equivalent being exported.
- Milk production growth has been slow over the past 20 years, with output only growing about 9% in that time.

Price & Production Trends

- UK milk production has been in a slow uptrend since 2012.
- UK farmgate milk prices tend to be slightly below US values, with less month-to-month volatility, but similar long-term price range.
- From 2016 through 2020, UK farmgate milk prices averaged the equivalent of \$15.90 per hundredweight compared to \$17.42 in the US (-9%)



Aligned Milk Contracts in UK

Cost-Plus Pricing Model for Beverage Milk

- Aligned milk contracts have been playing a key role since their inception in 2007, their major purpose being to offer a cost-based pricing model for retailers, processors and producers.
- These contracts hold strong PR value for retailers, who use them to show that a “fair price” above cost of production is being paid to their producers through these schemes.
- Overall, it is estimated that around 16% of milk production goes into aligned contracts.
- An independent agricultural consultancy is used to determine costs of production every three months. The process takes into account changes in on-farm costs, including prices for feed, fuel, and fertilizer. Process determines price for the subsequent three months,
- Each participating farm must abide by codes of practice imposed by the retailers: farm standards, milk recording and animal welfare requirements, farm management practices such as more emphasis on the environment, carbon foot printing and antimicrobial usage.



UK Dairy Code of Conduct

- In the late 2000s and early 2010s, farmers complained about sudden price declines, retrospective price declines combined with processors insisting on 12-month notice by a producer wishing to switch milk buyers.
- The Voluntary Code of Practice in Contractual Relationships was introduced in 2012 but faced criticism for not being mandatory or applying to dairy cooperatives.
- Since 2020, the UK Government has been in the process of developing a new statutory Code of Conduct for the dairy sector, using section 29 of the Agriculture Act 2020, delivering on the Government's promise to increase fairness in the supply chain and help farmers become more competitive.
- What farmer groups are asking for:
 - 1) **Pricing:** Transparency and remove buyer's ability to change at will
 - 2) **Representation:** Negotiating power to coops and producer groups
 - 3) **(No) Exclusivity:** Ability to supply multiple buyers at the same time
 - 4) **Contract Terms:** In writing, mutually agreed and changes by consent only
 - 5) **Consequences of Breach:** Arbitration process, penalties for bad behavior



Department
for Environment
Food & Rural Affairs

UK Dairy Code of Conduct: Issues

Contract Terms

- The use of written contracts reinforces certainty in supply arrangements. Whilst written contracts are already commonplace in the United Kingdom between dairy producers and purchasers, they are not currently a legal requirement.

Government survey asked farmers the following questions:

- Should trading relationships between producers and purchasers always be covered by a written contract?
- Should contracts be allowed to be confidential?
- Should contracts specify a minimum and maximum length of supply arrangement?
- Should all changes to the contract be mutually agreed upon?
- What is the most effective means of dispute resolution and should this approach be binding or advisory?
- What is the minimum notice period for a contract termination?

UK Dairy Code of Conduct: Issues

Volume and Payment Terms

- The lack of reliable dairy pricing information has emerged as one of the major issues facing dairy farmers. More transparent pricing can facilitate greater trust between business partners and ensure negotiations happen on an equal footing. Increased certainty, both in terms of price certainty for producers and supply certainty for processors, is likely to strengthen the entire industry. Certain pricing practices can allow a degree of market responsiveness, and it is not the intention to undermine flexibility in the marketplace, but rather to introduce a greater degree of transparency to procedures concerning price.

Government survey asked farmers the following questions:

- Should there be a legal obligation to include a price/price calculation mechanism in a contract?
- In order to achieve transparency, should the methodology behind any price mechanism be detailed within a contract?
- Should contracts have to contain, in clear and unambiguous language, all terms and conditions relating to payments and deductions (i.e. premiums and incentives)?
- Should the volume of milk to be supplied be fixed in the contract?
- Should exclusivity be prohibited?

UK Advantages & Challenges

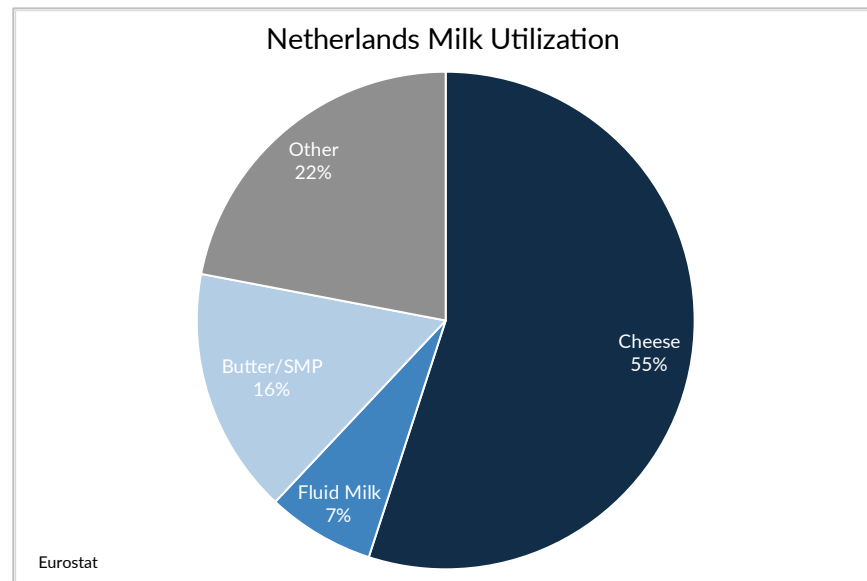
ADVANTAGES

- **Cost-plus pricing for beverage milk.** Input costs to retailers are predictable, set quarterly, and separated from volatile commodity returns. Retailers use third-party validators to establish benchmark cost of production index used for pricing raw milk at a premium over commodity prices.
- **Inclusive dairy reform process.** UK government has undertaken a comprehensive survey of dairy farmers with over 20 questions on desired attributes of the forthcoming dairy pricing regulation. Topics covered are contracting terms, transparency in pricing, and processes for resolving disputes between dairy producers and milk buyers. The government is focused on providing frameworks for contracting, but without limiting agility of dairy processors or skewing incentives through minimum regulated prices.

CHALLENGES

- **Negotiating power imbalance.** At present time, there are no enforceable mechanisms in place to balance negotiating power of dairy producers and milk buyers, which a cause of considerable frustration among producers. Milk buyers require exclusivity and long notice before producers can switch buyers, but offer little transparency on milk pricing, or instruments for managing dairy farm revenue risk. This issue will be addressed in the legislative package currently under development.

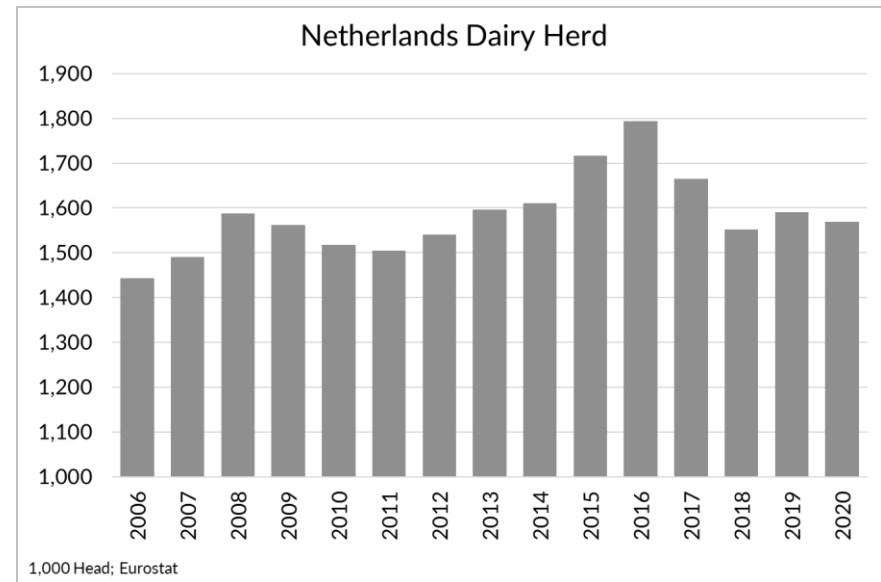
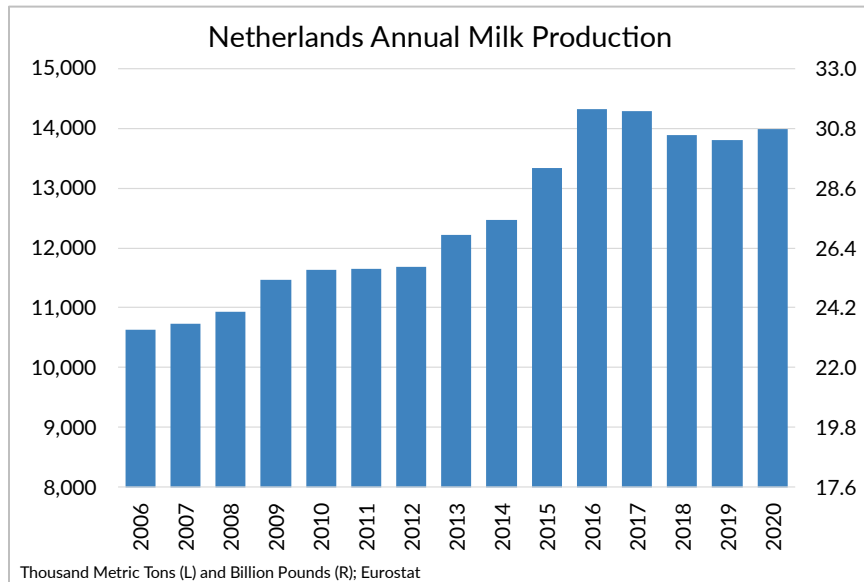
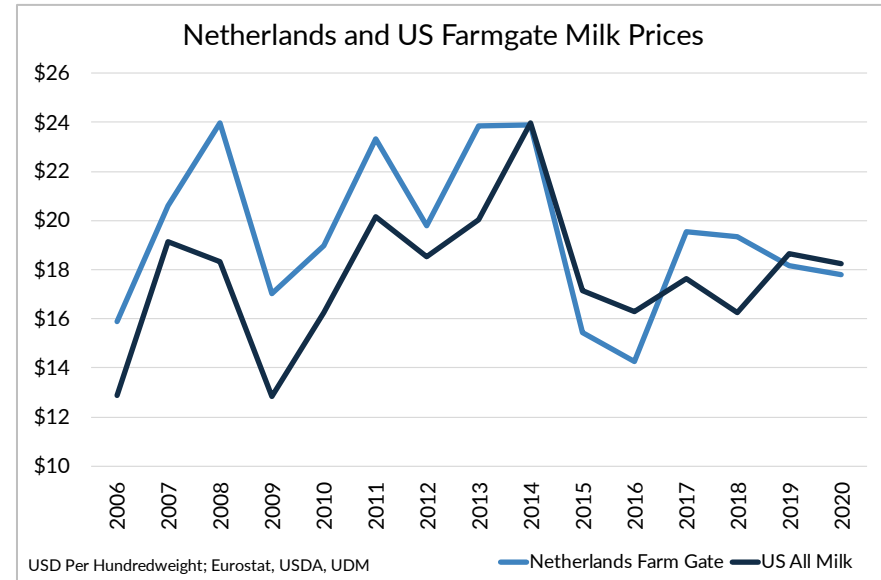
Country Profile: Netherlands



- Netherlands milk production is roughly 14% of US annual milk production.
- The Netherlands is a significant global dairy exporter, with roughly 80% of production in milk equivalent being exported.
- Milk production growth has been strong since 2012, with output growing about 20% in that time.
- Due to phosphate legislation, the sector has been faced with limited growth opportunities since 2017.

Price & Production Trends

- Netherlands milk production rose sharply from 2007 to 2016 before plateauing.
- Netherlands Farmgate milk prices tend to be close to US values, with less month-to-month volatility.
- From 2016 through 2020, farmgate prices in the Netherlands averaged the equivalent of \$17.81 per hundredweight compared to \$17.42 in the US (+2%).
- FrieslandCampina is the dominant milk handler.



FrieslandCampina: Diversified Portfolio



Food & Beverage Group

Milk, yogurt, condensed milk, dairy-based beverages, cheese, butter and cream, marketed through consumer (B2C) and professional (B2B) channels.

Trading Group

Basic dairy products for B2B customers: Cheese, butter, milk powder and liquid products such as raw milk, cream, skimmed milk or milk concentrate.



Ingredients Group

Ingredients for infant nutrition and offers innovations and solutions for adults in the areas of medical, active and performance nutrition.



Special Nutrition Group

Branded products, dairy nutrition to specific groups of consumers, varying from infants to adults with specific requirements during various life stages.

FrieslandCampina: Milk Pricing

Guaranteed Price

- Amount Friesland Campina pays to member dairy farmers every month for each 100 kilos of milk.
- Corresponds to the average annual prices for first-class milk, including bonuses, from reference companies in Germany, Denmark, the Netherlands and Belgium.
- Applies per 100 kilos of milk, with 3.57% protein, 4.42% fat and 4.53% lactose.
- Based on the published guaranteed price, a value is calculated per 100 kg of protein, fat and lactose. The price ratio between protein, fat and lactose is 10:5:1. In other words, member dairy farmers receive twice as much for a kilo of protein as for a kilo of fat, and five times as much for a kilo of fat as for a kilo of lactose.
- The guaranteed price paid to member dairy farmers is also the cost price for the factories.
- If member dairy farmers let their cows graze in the meadows, they receive an outdoor grazing allowance.



Sustainability Incentives



FrieslandCampina Sustainability Goals

- Climate-neutral by 2050.
- Emissions reduced by at least a third by 2030 (compared to 2015).
- Have deep insight through supply chain traceability of important raw materials by 2025.

“Foqus Planet”

- Program contains over 200 requirements for hygiene, quality, food safety, animal welfare, sustainable production and outdoor grazing.
 - Some standards are mandatory and apply to all farms, e.g. no tail-docking, growth hormones are prohibited, etc.
- Beginning in 2021 FrieslandCampina also pays member dairy farmers a premium for their score on sustainable development through the Foqus Planet
- Premium consists of two parts: a generic premium of €0.125 per 100 kilos of milk and a premium that depends on the number of Foqus Planet points (sustainable development) and the amount of milk delivered.
 - Maximum company contribution for Foqus Planet is €24 million.

Netherlands Advantages & Challenges

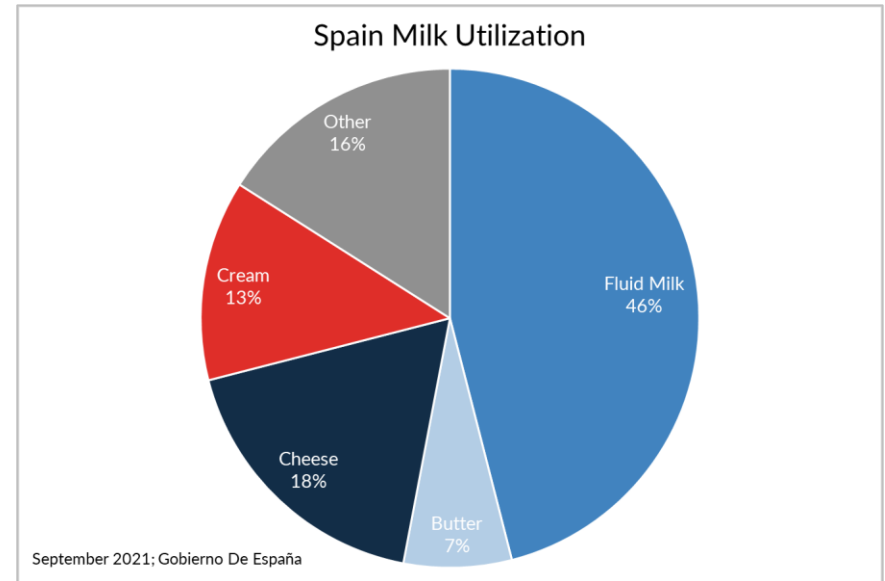
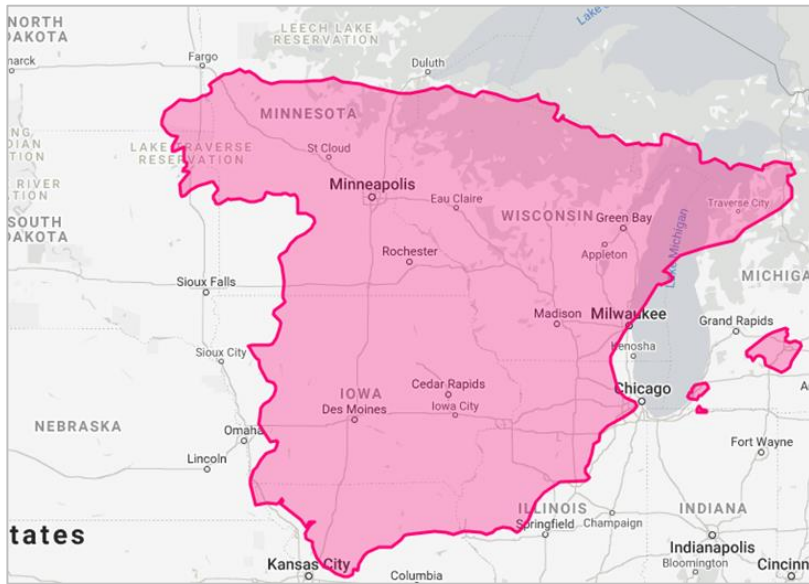
ADVANTAGES

- **Competitive benchmarking.** FrieslandCampina pays the gross milk price based on what other major companies pay in Europe, averaged over a year. This removes month-to-month changes in raw input cost to company plants and allows for aggressive bidding on export opportunities. Further, this approach clearly separates returns on value-added activities from 'commodity business'.
- **Incentive to diversify dairy product portfolio.** FrieslandCampina captures full value from allocating milk to highest-value use, incentivizing robust dairy product portfolio diversification. Returns are passed to producers or retained/reinvested.
- **Sustainability leader** FrieslandCampina has set aggressive sustainability goals which will support their brands focused on value-added ingredients and branded products.

CHALLENGES

- **Environmental regulations.** Dairy production growth in the Netherlands is severely constrained by limitations on phosphates and with forthcoming continent-wide plans to reduce greenhouse gas emissions.
- **No independent price discovery.** All indicators are monthly. There is no domestic spot market or auction to discover dairy product prices.

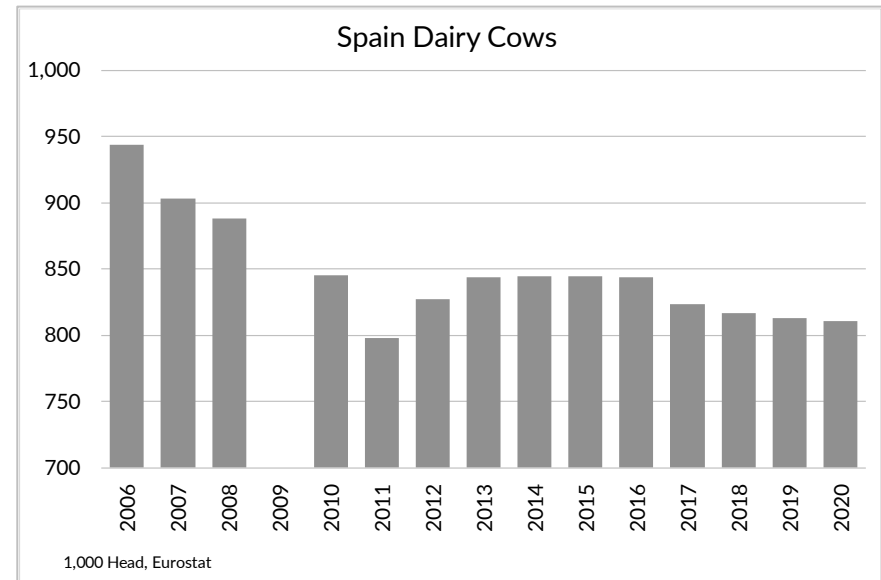
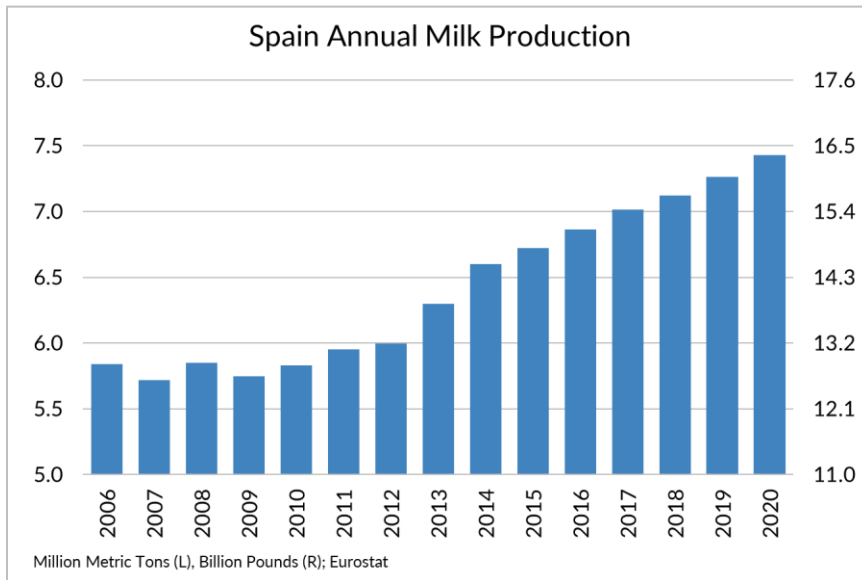
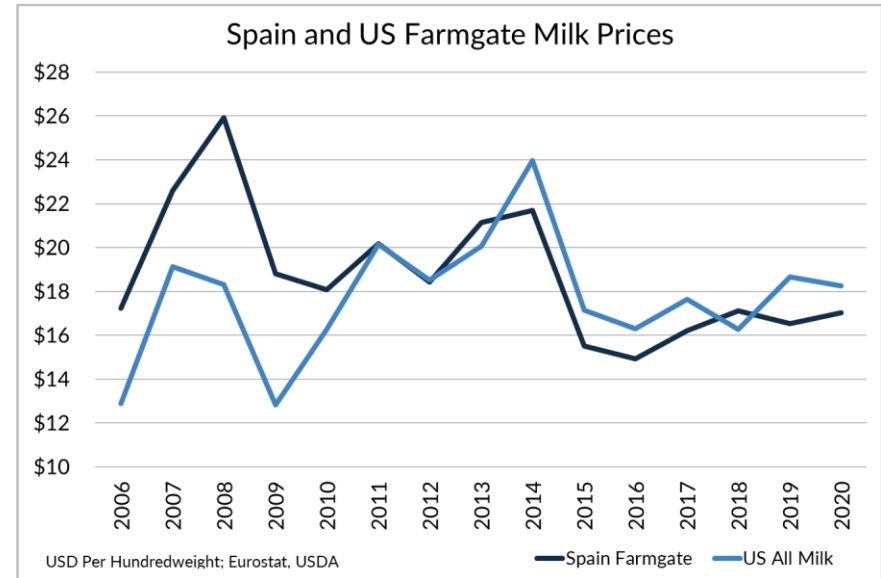
Country Profile: Spain



- Spain milk production is roughly 7% of US annual output.
- The Northwest, near Galicia, is the most productive region.
- Spain is a modest global dairy exporter, shipping roughly 20% of production in milk equivalent terms, representing less than 1% of world dairy trade.
- Spain has regulations requiring written contracts between first buyer and producers. Contracts can be fixed or variable, depending on market parameters such as price. Also includes quality, bonuses, VAT, penalties etc.

Price & Production Trends

- Spain farmgate prices tend to be slightly lower than those in the US. From 2016 through 2020, Spain prices averaged \$16.37 per hundredweight compared to \$17.42 in the US (-6%).
- Production has risen steadily over time, with milk production expanding roughly 2.5 billion pounds (1.1 million metric tons) or 18% from 2013 to 2020.



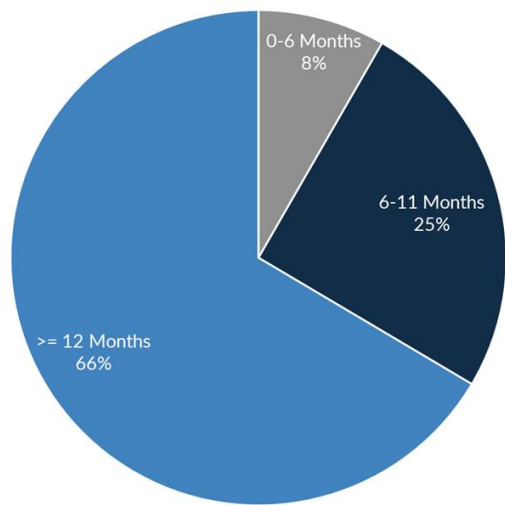
Regulation Goals

- Improve bargaining power of dairy producers.
- Provide minimum terms of trade for contracts between producers and milk buyers.
- Provide transparency and timely information regarding market conditions.
- Improve milk supply quality, consumption of dairy products and innovation in dairy processing.



Milk Supply Agreements

Spain Milk Supply Agreement Duration



- Regulation authorizes and encourages dairy producers to bargain with processors through producer organizations.
- All raw milk must be purchased under written agreements. Processors must offer agreements of at least one year in duration but producers can opt for a shorter contract.
- All contracts must be offered at least 60 days before they commence.
- Contract must specify rules regarding the volume and allow for penalties for surplus volume.
- Industry publishes detailed statistics regularly

Comunidad Autónoma	NÚMERO					Total Contratos	Contrato-tipo homologado*	PORCENTAJE				Contrato-tipo homologado sobre el total
	<3 meses	>3 m - <6 m	>6 m - <12 m	≥1 año	<3 meses			>3 m - <6 m	>6 m - <12 m	≥1 año	Total % Contratos	
Andalucía	1	2	1	77	81	0	1,23%	2,47%	1,23%	95,06%	1,02%	0,00%
Aragón	0	1	9	9	19	0	0,00%	5,26%	47,37%	47,37%	0,24%	0,00%
Asturias (P. de)	1	12	32	333	378	0	0,26%	3,17%	8,47%	88,10%	4,75%	0,00%
Baleares (Illes)	8	2	1	67	78	0	10,26%	2,56%	1,28%	85,90%	0,98%	0,00%
Canarias	0	1	2	106	109	0	0,00%	0,92%	1,83%	97,25%	1,37%	0,00%
Cantabria	2	75	156	404	637	0	0,31%	11,77%	24,49%	63,42%	8,00%	0,00%
Castilla - La Mancha	1	8	31	62	102	0	0,98%	7,84%	30,39%	60,78%	1,28%	0,00%
Castilla y León	28	56	362	180	626	0	4,47%	8,95%	57,83%	28,75%	7,86%	0,00%
Cataluña	10	7	49	196	262	0	3,82%	2,67%	18,70%	74,81%	3,29%	0,00%
Extremadura	0	0	13	3	16	0	0,00%	0,00%	81,25%	18,75%	0,20%	0,00%
Galicia	33	389	1.257	3.765	5.444	0	0,61%	7,15%	23,09%	69,16%	68,34%	0,00%
Madrid (C. de)	2	0	19	27	48	0	4,17%	0,00%	39,58%	56,25%	0,60%	0,00%
Murcia (R. de)	16	0	3	5	24	0	66,67%	0,00%	12,50%	20,83%	0,30%	0,00%
Navarra (C.F. de)	1	0	41	22	64	0	1,56%	0,00%	64,06%	34,38%	0,80%	0,00%
País Vasco	0	2	28	11	41	0	0,00%	4,88%	68,29%	26,83%	0,51%	0,00%
Rioja (La)	0	1	4	1	6	0	0,00%	16,67%	66,67%	16,67%	0,08%	0,00%
Valenciana (C.)	1	1	1	28	31	0	3,23%	3,23%	3,23%	90,32%	0,39%	0,00%
TOTALES	104	557	2.009	5.286	7.966	0	1,31%	6,99%	25,22%	66,48%	100,00%	0,00%

* Contrato-tipo homologado: conforme a la Orden APA/729/2019, de 19 de junio, a solicitud de la Organización Interprofesional del Sector Lácteo (INLAC). Debido a la expiración de la vigencia de la citada orden a partir del mes de julio no se contabilizan contratos tipo-homologado.

Flexible, Index-Based Pricing

- Milk supply agreements must be based on fixed, variable or 'mixed' prices (different pricing rules for different volume levels).
- Industry trade association calculates "A2" and "A3" indices used to adjust producer milk prices up or down each month.
- Contracts offering variable prices must be based on publicly available reference prices or indexes, specified in the contract.
- Reference prices must be objective, verifiable, not manipulable, easily identifiable and reproducible by both parties to the contract.
- Regulation leaves the freedom to processor and producer organizations to negotiate which pricing formula to use.
- One option: a processor offers a base price for the first month of the contract, with the price increase/decrease for other months created by multiplying the base price and monthly increase/decrease in the A2 index.

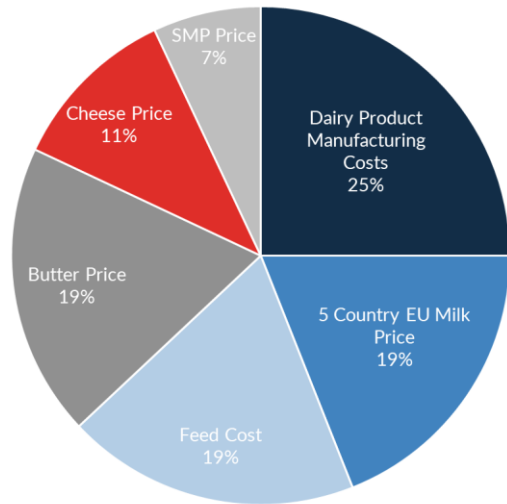
Índices de referenciación láctea

 Vacuno  Ovino  Caprino

	Fecha	Variación mensual	Variación anual
Índice A2	Sep 2021	1.68	12.13
Índice A3	Sep 2021	2.17	9.03

Different Indices for Domestic & Export

Spain A2 Price Index Composition



- A3 Index is equal to A2 Index, except that it can never be more than 5% higher, nor more than 5% lower than the average milk price in 5 EU member states.
- In all cases, prices may also be adjusted based on premiums depending on factors such as: the volume supplied, the physical-chemical or hygienic-sanitary quality, or other parameters. Processors are also allowed to offer profit-sharing provisions.

Spain A2 & A3 Milk Price Index



Spain Advantages & Challenges

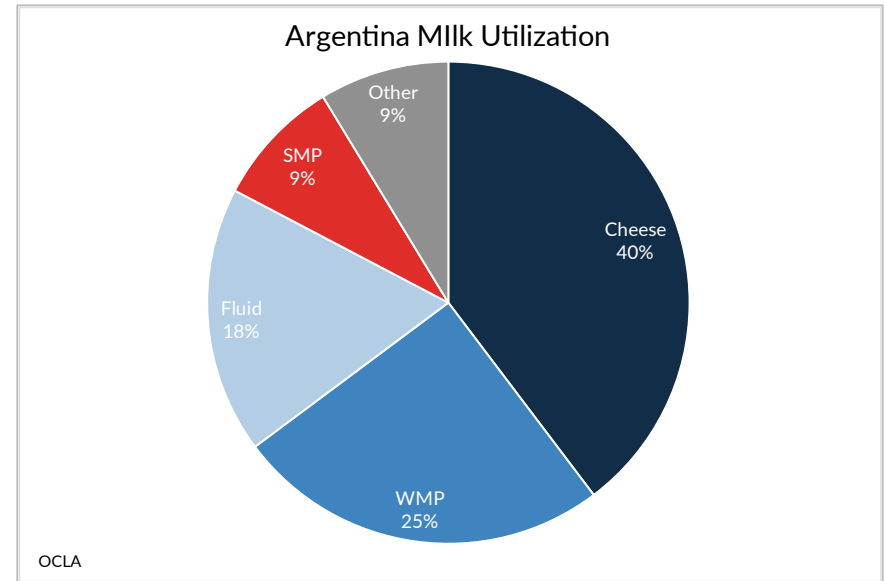
ADVANTAGES

- **Improved transparency and visibility.** All factors changing milk price from month to month are in public domain.
- **Balancing flexibility and bargaining power.** Producers can form organizations and bargain collectively, but processors are free to offer contracts that best suit their business model.
- **Market access.** Annual contract duration reduces transaction/bargaining costs, and provides producers with degree of confidence regarding market access.
- **Price stability.** Index designed for domestic markets includes dairy processing cost and livestock feed costs, likely making it more stable than any price based solely on commodity prices.

CHALLENGES

- **Limited risk management tools.** Flexibility and lack of industry coalescence around benchmark pricing implies that risk management instruments such as futures and options contracts are likely to have high basis risk
- **No independent price discovery.** All indicators are monthly. There is no domestic spot market or auction to discover dairy product prices.

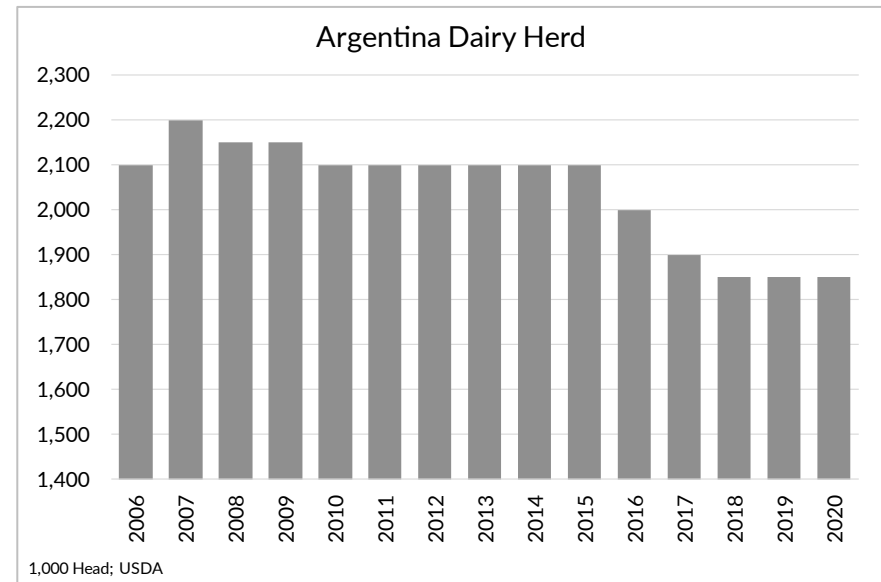
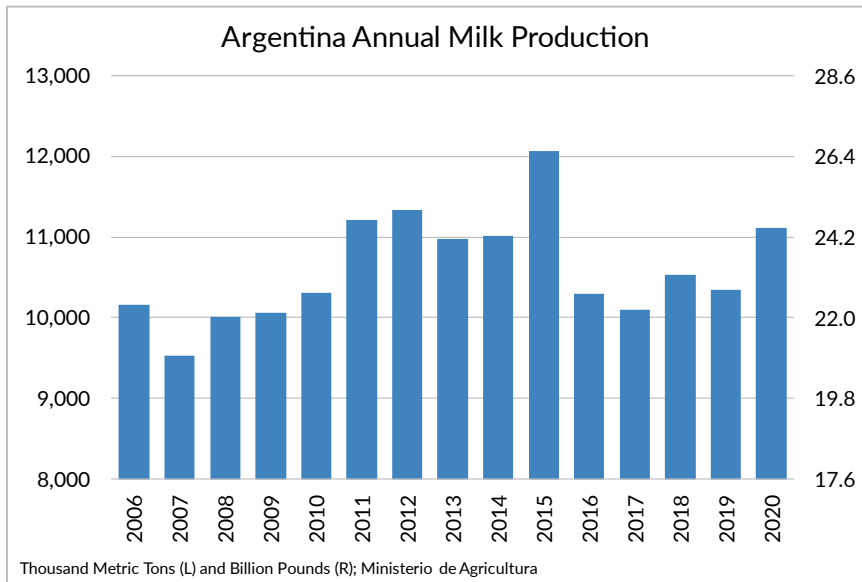
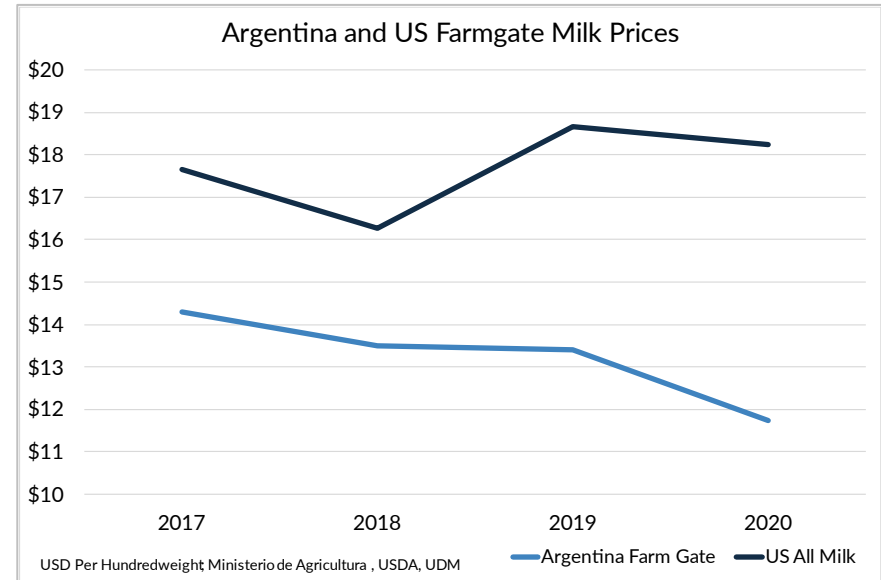
Country Profile: Argentina



- Argentina milk production is roughly 10% of US annual milk production.
- Argentina is a significant global dairy exporter, with roughly 25% of production in milk equivalent being exported.
- Milk production has been declining in the past decade.

Price & Production Trends

- Argentina farmgate milk prices are substantially below US all milk prices.
- Argentina milk production has declined over the past decade.
- Geopolitical uncertainty is high, with strong inflation and changing government tax policy.



Informality and Competition

- Argentina's milk pricing system is marked by its informality. Though numerous attempts have been made over the past decade to formalize the system, none of these have fully succeeded. Thus, there is a disconnect between pricing information laid out by formal institutions and what occurs at a practical level.
- At the most basic level processors set the price of milk and pay producers based on volume assuming the milk meets basic sanitary measures. In many cases processors do not pay on component values. In general, producers do not have long term contracts with processors and may switch between processors based on who is offering the highest price. Cooperatives are not common, and producers are not organized for collective bargaining.
- The Argentine Ministry of Agriculture estimates that only 52.7% of available industrial capacity was utilized in October 2021, the most recent month for which data is available. Excess capacity leads to intense competition for milk, tampering dairy farmer need for formal regulation and centralized milk pricing system.
- Both processors and producers have demonstrated resistance to founding relationships on longer term contracts.

Proposed Milk Pricing System

- Since 2016, Argentina's Ministry of Agriculture, Livestock and Fisheries has been promoting a new system for tracking what processors pay to producers and guiding how processors set the price.
- Under this system, processors are free to set prices at the competitive level, but are encouraged to pay based on quality along the following guidelines:
 - 80% of the milk price should reflect components and hygiene
 - 60% of this value should be tied to composition (fat, protein)
 - 40% of this value should be tied to sanitary/hygiene measures (somatic cells, bacteria counts, etc.)
 - 20% of the milk price should reflect bonuses such as:
 - Distance from the dairy to the manufacturer;
 - End use of milk;
 - Volume of milk delivered, etc.
- Within the first five working days of the month, processors must notify their prices per kilogram of fat and protein, any bonuses or penalties tied to sanitary/hygiene factors, geographical differences, and payment details.
- The system also provides guidance around how samples must be tested, which laboratories are qualified to test samples, and how disagreements are settled.
- Participation in the new system is voluntary, with large milk buyers effectively forced in, and smaller processors not yet participating.

Argentina Advantages & Challenges

ADVANTAGES

- **Strong competition for milk.** Even if they are price takers, producers get fairly compensated when there is strong competition for milk. Because there is excess plant capacity, competition for milk tends to be high.
- **New regulatory system seems well balanced.** The new system, recently introduced by the Ministry of Agriculture, Livestock and Fisheries, focuses on price transparency, terms of trade, and promotion of comparable milk pricing schemes that target milk composition and hygiene/quality. Prices are still set based on competitive basis, ensuring that milk will be allocated to highest-value use.

CHALLENGES

- **Informal economy and short-term planning horizons.** The informal system, dominant until very recently, promoted short-term thinking for both producers and processors. The system did not offer any kind of stability, it was difficult for participants across the dairy chain to plan or to make long term investments.

About the Authors

Dr. Marin Bozic, PhD, is an Assistant Professor at University of Minnesota's Department of Applied Economics. Marin's research program covers dairy policy, risk management and demand for dairy foods. He's also a principal of Bozic LLC, a company that develops and maintains livestock insurance programs for USDA Dairy Revenue Protection, Livestock Gross Margin and Livestock Risk Protection. Dr. Bozic is an advisor to several dairy trade associations, a popular national speaker on economics of dairy markets and a frequent consultant on important dairy market and policy issues.

Blimling and Associates is a widely respected dairy market research and consulting firm based in Madison, Wisconsin. Clients across the dairy supply chain and around the world rely on Blimling and its team of seasoned market experts for actionable insights and strategic support – and have done so for more than 20 years. Our portfolio of offerings includes timely and insightful publications, in-depth research projects, educational sessions and continuous consulting support. Clients include foodservice operators, retailers, consumer packaged goods companies, farmer-owned cooperatives, individual dairy producers, industry associations, and investment firms. Blimling and Associates is part of the Dairy.com family of companies that now includes ever.ag.

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