United States Department of Agriculture

Before The Secretary of Agriculture

In re: [Docket No. 23-J-0067; AMS-DA-23-0031]

Milk in the Northeast and Other Marketing Areas

Hearing beginning August 23, 2023

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Proposal 13. Restore the Original Federal Order Reform Class I Skim Milk Price Mover

1. Introduction

My name is Sara Dorland. My business address is 360 East Avenue #300, Ketchum, Idaho. I run Ceres Dairy Risk Management LLC, which advises dairy industry clients. Since 2009, I have provided consulting services throughout the US Dairy Supply Chain – working with dairy producers and multi-national corporations, advising on topics ranging from federal and state milk marketing orders, markets, risk management, milk procurement, and finance. I have attached my CV here (**Dorland Exhibit 1)**.

Today, I am testifying to support returning to the higher of the Advanced Class III or Class IV skim milk price to establish the advanced Class I skim milk price (Proposal 13). I have reviewed and analyzed data related to the current calculation versus the proposed Class I skim milk price methodologies and the impact on producers, processors, and retailers regarding milk pricing, de-pooling, and risk management. The data I have been able to review indicates that the higher of Class III or Class IV skim pricing scheme ("Higher-of") is more effective compared to the current average of Class III and Class IV skim + $0.74 hundredweight ("cwt") pricing methodology ("Average-of") for several reasons, including 1) it transmits market signals in real-time, 2) it doesn't detract from Class I hedging, 3) it avoids the unnecessary complication of reimbursements that could disadvantage small-to-mid-sized dairy producers and further distort price signals and 4) it is designed to work within the current Federal Milk Marketing Order ("FMMO") pricing and avoids the pitfalls of prolonged periods of de-pooling that can cause disorderly marketing. I have also reviewed other proposals, including Proposals 14, 15, 16, 17, and 18, that seek to replace the current Average-of with the higher of the announced Class III or Class IV milk price or Class III plus a differential or elimination of advance pricing. Unfortunately, these price alternatives do not improve upon the current Average-of price, with each having idiosyncrasies falling well short of the Higher-of achievements and the FMMO objectives.

2. Background: The Class I Mover

2.1. Class I Mover purpose and function

The FMMO classified milk pricing system has the precision of a Swiss watch movement. It is intricate, but that complication is necessary to regulate a diverse system of dairy producers, processors, and consumers to avoid market disruption events caused by disorderly markets. A jeweler eloquently explained the Swiss watch movement as, "The beating heart of your watch, the movement is an intricate mechanism containing hundreds of moving parts which work together to keep track of time." (Beaverbrooks , 2001 - 2023). A parallel to the FMMO. Rather than tracking time, the FMMO goals are:

1. "Promote orderly marketing conditions in fluid milk markets,"
2. "Improve the income situation of dairy farmers,"
3. "Supervise the terms of trade in milk markets in such a manner as to achieve more equality of bargaining between producers and milk processors, and"
4. "Assure consumers of adequate supplies of good quality milk at reasonable prices." (Congressional Research Service, Updated June 15, 2022)

As impressive as the Swiss watch movement is, given advancements from Apple, Garmin, and others, it can be considered stodgy, old, or a relic. The same could be said about the FMMO system. Times are changing, markets are moving faster, and dairies are consolidating and are different from their predecessors in size and scope. The earliest known Swiss watches, miniature clocks, were built in the early 1500s. (Swiss Canadian Chamber of Commer, 2018) A lot has changed in 700+ years – but how we tell time has undergone few changes. Fast approaching its 100th anniversary, the FMMO system has witnessed extraordinary change, but the most basic justifications for that system persist today.

- Milk is highly perishable,
- There is no distinct harvest or season compared to field crops,
- Production and demand have noticeable seasonal patterns,
- Fluid milk demand is more inelastic relative to other dairy products,
- Excess milk must move to longer-shelf-life products like nonfat dry milk powder ("NDM"), cheese, butter, yogurt, etc.,
- The dairy industry has high fixed costs – from farms to processing facilities. (Congressional Research Service, Updated June 15, 2022)

The FMMO objectives are met by encouraging pool participation and using minimum and classified prices. A higher Class I milk price, relative to the other class prices, sends signals throughout the market to move milk to and from surplus-deficit regions to ensure adequate fluid milk supplies for the market – it acts as a governor or control. Class I primacy is necessary to support the current FMMO system design –the standard by which formulas proposals should be evaluated.

Although Class I use has declined due to rising milk production and lower per capita consumption of bottled milk, Class I's ability to attract milk to the pool, one of its primary purposes, remains intact – 69.8% of US milk was pooled in 2000 compared to 66.9% in 2022 (see **Table 1**).

Table 1 – FMMO Milk Receipts 2000-2022

Year	FMMO Number	Number of Pool Handlers	Number of Pooled Producers	Population of FMMO (in 1,000)	US Milk Production (in MM lbs)	Total Receipts of Producer Milk (in MM lbs)	Producer Milk Used as Class I (in MM lbs)	Percent of Producer Milk Used as Class I	Percent of US Milk in Pool
2000	11	346	69,585	228,899	167,393	116,923	45,989	39.3%	69.8%
2005	10	302	53,032	238,428	176,931	114,682	44,570	38.9%	64.8%
2010	10	251	45,918	284,480	192,877	126,909	44,970	35.4%	65.8%
2011	10	241	43,650	286,600	196,255	126,879	44,383	35.0%	64.7%
2012	10	237	40,745	288,732	200,642	122,388	43,492	35.5%	61.0%
2013	10	225	40,043	290,752	201,260	132,100	42,752	32.4%	65.6%
2014	10	223	39,146	292,825	206,048	129,420	41,420	32.0%	62.8%
2015	10	214	36,112	295,130	208,508	126,126	41,206	32.7%	60.5%
2016	10	216	34,689	297,291	212,451	133,846	41,140	30.7%	63.0%
2017	10	217	32,981	299,172	215,527	135,502	40,642	30.0%	62.9%
2018	11	233	32,061	300,171	217,568	141,684	40,945	28.9%	65.1%
2019	11	230	29,468	302,048	218,441	156,510	43,882	28.0%	71.6%
2020	11	228	24,906	303,063	223,309	137,818	43,766	31.8%	61.7%
2021	11		23,292		226,258	136,836	42,127	30.8%	60.5%
2022	11		23,108		226,620	151,614	40,986	27.0%	66.9%

Source: Federal Milk Order Market Statistics 2020 Annual Summary; Milk Production Report; AMS Class I, II, III, & IV Utilization

Lower utilization doesn't diminish the importance of the Class I milk price function and how it continues to set the milk price for one-in-four pounds of milk marketed in the FMMO. But more importantly, Class I attracted 49% of the nation's milk into the pool last year, above the mandatory volumes of Class I milk regulated on the market (67% of all US milk was pooled in 2022, including Class I). A rather high percentage, given prolonged de-pooling in 2022.

The Class I milk price is the power source of the current FMMO system – the mechanism that keeps the system functioning, implying changes to the Class I milk price should be infrequent and done with the utmost care. If the Class I milk price does not establish the price correctly, the system begins to malfunction. Hindsight being 20/20, the industry found the average of advanced Class III and Class IV skim milk prices plus $0.74 per hundredweight ("cwt") ("Average-of") and the higher of the advanced Class III or Class IV skim milk prices ("Higher-of") are not the same. They do not function the same, and changing the mechanism has caused the system to stop working properly and efficiently since the May 2019 implementation.

2.2. Dairy risk management

Before delving into risk management, it is important to highlight another key component of the FMMO – data collection and dissemination. The FMMO system created the structure to collect data and disseminate information for dairy commodities, allowing for transparent, timely information that supports spot and futures trading. The level of transparency USDA provides does not exist at comparable levels in other parts of the world, resulting in substantially lower open interest and daily volumes. For markets to function properly, sufficient information must be available to participants – dairy producers, processors, and speculators or outside money. While most would like perfect information, that is impractical. US dairy's abundant data, transparency, and market access facilitate proper function and information necessary for efficiently functioning dairy markets. I have witnessed liquidity increase, allowing for more risk management opportunities for dairy producers, processors, and end-users. But, on occasion, I have watched inadvertent or minor changes cause open interest to drop, creating inefficient markets.

Real-time data, spot markets, and transparency are hallmarks of efficient markets, permitting futures markets to attract buyers and sellers – providing a marketplace and opportunity to manage risk. Historically, commodity markets have allowed producers, farmers, and buyers to exchange risk at a centralized market. But since the early 2000s, the impacts of outside money have been present in dairy markets due to financialization (Xiong, 2014), albeit on a smaller scale – that, along with electronification, has modified futures and options markets, allowing them to trade instantly. By comparison, the last time there was a national FMMO hearing, the CME dairy futures and options markets were considerably smaller than today – approximately 36,631 contracts on December 26, 2006 (CFTC.gov, 2006), compared to 59,347 contracts on December 27, 2022 (CFTC.gov, 2022).

Since the 2007-2008 bust of commodity markets, academics have studied "information frictions" to determine the impact on efficient markets. While perfect information is impractical given the time and expense to collect the final data point and the speed with which markets change. For those reasons, efficient markets can continue to function without perfect information, but acknowledging frictions or imperfect information exists between market participants. Additionally, academics are trying to understand whether boom-bust cycles in commodity markets can explain price movements or whether speculative, outside money can exacerbate those cycles. While dairy commodity markets are smaller than grain, oil seed, and energy markets, the advent of more reporting from swaps dealers, managed money, and other reportable entities has increased considerably since 2006 (**Dorland Exhibit 2**). More money in dairy markets provides additional liquidity and facilitates risk management, but it does change some of the market function as financial traders have different objectives than those managing risk.

While there is a desire to evaluate dairy risk management under a pre-2006 backdrop, given the financialization of all commodity markets, including dairy, it could lead to inaccurate conclusions. As a result post 2007-2008 commodity market bust, economists find that "in contrast to conventional wisdom that a higher commodity price leads to a lower quantity demanded by goods producers, our model shows that demand may increase with price." (Xiong, 2014) CME dairy futures operate in a smaller microcosm than larger commodity markets like oil, corn, and wheat; however, the concept that futures prices represent the strength of the global economy, or in the case of dairy, global demand has a profound impact on domestic pricing and policy decisions that should not be discounted when reviewing the Class I Skim

"Higher-of" versus "Average-of" Pricing. Further, while this document focuses on Class I – modifications to the system could have consequential impacts throughout the FMMO system and related risk management activity.

2.3. The 2017 Average-of analysis

Before the 2018 farm bill, National Milk Producers Federation ("NMPF") and the International Dairy Foods Association ("IDFA") jointly proposed a new Class I skim milk price formula to Congress. The analysis involved calculating and comparing the average value of the Higher-of the advanced Class III and Class IV skim milk prices to the Average-of the advanced Class III and IV skim milk prices from January 2000 to August 2017. That resulted in an average historical difference of $0.74/cwt that was ultimately incorporated into the Agriculture Improvement Act of 2018 (Pub. L. 115-334)("2018 Farm Bill") as "the simple Average-of the monthly advanced pricing factors for Class III and Class IV skim milk, plus $0.74 per cwt, plus the applicable adjusted Class I differential." (Agricultural Marketing Service, 2019)

For the Average-of methodology to be valid, the assumptions driving the relationship between Class III and IV skim milk must 1) be similar in scope and scale to the study period and 2) exist in future periods. Because there is no mechanism to regulate the relationship between the Class III and IV skim milk prices, changes in future periods, would result in an imbalance between dairy producer and processor contributions compared to the assumptions. That would undermine the principal trade-off of the Average-of proposal that the parties' contributions would mimic the study period.

The Average-of analysis calculated a $0.74/cwt long-term average benefit between the Higher-of compared to the Average-of approach. Based on the data, 59% of the time, processors would spend an average of $0.26/cwt more than the Higher-of formula, and 40% of the time, dairy producers would give up $0.48/cwt. The Average-of assumed post-implementation contributions to the $0.74/cwt would resemble the study period, or something comparable. Based on that analysis, dairy producers and processors exchanged the Higher-of pricing method for the Average-of expecting 1) more viable Class I risk management with an expected outcome of more stable bottled milk sales, 2) an Average-of skim price that would be neutral to dairy producers, implying the Average-of would be similar to the Higher-of price over time, 3) and that the Average-of Class I milk price would continue to support the function of the FMMO system over time.

The analysis period's standard deviation or the measure of how dispersed the data was spread around the mean, indicated there could be issues with the Average-of methodology. The minimum Average-of differential observation was $0 between January 2000 and August 2017, and the maximum was $3.38/cwt with a standard deviation of $0.59. Given that the difference could only be positive under the approved formula, a $0.74/cwt mean, $0.16 mode, and $0.59 median suggests an asymmetric risk that could disproportionately impact dairy producers over processors in periods of volatility. The histogram plot of the Higher-of to Average-of benefit (**Dorland Exhibit 3**) and the differing mean, mode, and median demonstrate that the formula represents a positive skew rather than a standard distribution. Over that span, the maximum cost to processors was $0.74/cwt, but the revenue reduction to dairy producers was $2.64/cwt because the current system does not limit or regulate the relationship between the Class III and Class IV skim milk prices.

The intent "of both Class I milk buyers and dairy farmer sellers was that the change would be revenue neutral and would accommodate the buyers' desires to better manage their price risk without harming the sellers," according to testimony provided by Peter Vitaliano, Exhibit NMPF - 30. Because the ultimate impact on processors and dairy producers was unknown at the time of the proposal, additional language was added to the final rule stating, "The formula [Class I skim] may be modified after the two-year period through the standard FMMO amendment process." That would afford dairy producers and processors to review the outcome of the formula change and propose modifications through the FMMO process should they be warranted. Although US dairy producer groups agreed to support replacing the Higher-of formula with the Average-of formula, it was conditioned upon proposed changes that benefit the overall industry but not at the cost of compromising the proper function of the FMMO system.

A review of the Average-of results since implementation (May 2019 through June 2023) exposed that the primary assumption was invalid – that the status quo would prevail in future years. Instead, underlying market conditions changed, altering the Average-of dairy producer and processor contribution outcome because the Higher-of vs. Average-of benefit exceeded the codified $0.74/cwt historical average. Between May 2019 and June 2023, the mean increased from $0.74/cwt to $1.26, and the standard deviation was $1.375 – reflecting a significant spread. Based on the histogram (**Dorland Exhibit 4**), the positive skew remained; however, since implementation, 44% of the time, the cost to processors was $0.42/cwt, and 56% of the time dairy producer revenue reduction was $1.25/cwt. The data indicates a shift in the cost of the Average-of program from processors to dairy producers and a substantial formula imbalance that favored processors over dairy producers. This result was contrary to the proposal, the agreed-upon trade-off, and the FMMO purposes, "Improve the income situation of dairy farmers," and "Supervise the terms of trade in milk markets in such a manner as to achieve more equality of bargaining between producers and milk processors." (Congressional Research Service, Updated June 15, 2022)

2.4. Implicit assumptions of the Average-of formula fail to anticipate future market events

Assuming static market conditions highlighted an idealistic but unrealistic expectation of the Average-of formula. A fundamental weakness of the Average-of formula is that it is backward-looking. It can only communicate to the market an echo of past events that influenced the price, but it fails to accommodate the rapid transmission of data needed in fast-moving, global markets. Ultimately, the Average-of formula is incapable of conveying current information about the market to facilitate the movement of milk from surplus regions to deficit regions as intended because it is grounded in historical rather than contemporaneous price relationships. This formula limitation resulted in dairy producers forfeiting more Higher-of to the Average-of benefit compared to processors' contributions – contrary to the assumption and most notably during periods of greater volatility or demand resulting in distorted market signals that may have worsened rather than alleviated supply-demand imbalances in the fluid milk market. Simply, Average-of-based formulas that anchor the calculation to the Higher-of skim price have an inferior performance as they can only communicate what happened in past periods, not what is happening today.

Some aspects of the FMMO formulas have predictive validity. For instance, with a high degree of certainty, the daily spot CME butter price informs market participants about the National Dairy Product Sales Report ("NDSPR") butter price and, ultimately, the Class III and IV butterfat values. Regressions help corroborate predictive validity. In the example, the CME weekly average butter price from two weeks ago has a 98.4% correlation to the current week's NDPSR butter price (**Dorland Exhibit 5**); therefore, market participants can rely on the relationship between the price series for evaluation, risk management, buy-sell decisions, etc. The same applies to products like cheese, whey, and nonfat dry milk ("NDM") and their impact on

Class III and IV milk prices because of the FMMO end-product pricing and classified price formulas – a well-defined relationship exists.

The interplay between the Class III and IV skim values is more complicated. No formula or stipulation relates or binds the Class III and IV skim milk price relationship. Rather, a series of market drivers, like global supply and demand, stocks, policy, trade, etc., change the underlying commodity value. Class III skim is based on cheese and whey markets; Class IV skim is derived from NDM. For example, product substitution, namely NDM used in the cheese make process in place of ultra-filtered, skim, condensed, or raw milk, helps to keep the relationship between Class III and IV skim milk prices related to one another. However, NDM replacing fluid milk products is not a 1:1 substitution, and several limits, including product labeling, formulation, functionality, cost, availability, make process, etc., keep substitution in check. Even with substitution, there are prolonged periods when Class III and IV skim milk prices can depart from one another by sizeable gaps, impacting the Average-of performance compared to the Higher-of.

As a result, the Average-of formula has limited ability to inform the market about future Class III and IV skim milk price relationships, meaning that the January 2000 to August 2017 Average-of and Higher-of difference would not properly reflect the future without an understanding of the underlying market drivers of Class III and IV skim price and what could cause prices to change over time. For example, between fiscal years ("FY") 2000-01 and 2009-10, USDA's Commodity Credit Corporation ("CCC") purchased over two billion pounds of NDM powder (USDA, FY2010). At that time, the support price for NDM ranged from $0.80/lb to $1.01/lb, with most periods reflecting the $0.80/lb or an effective floor for the NDPSR NDM to derive the Class IV skim price. The dairy price support program was terminated in 2014 (Agricultural Act of 2014, 2014) and will not impact future markets. However, the Average-of formula did not consider the impact the support price program had on Class III and IV skim milk price relationship between 2000 and 2006. That span accounted for 40% of the observations and would have reduced the spread or difference between the Class III and IV skim milk prices (**Dorland Exhibit 6**). Due to the termination of the price support program, several years of the Average-of and Higher-of comparison may 1) overstate the stability between the Class III and IV milk prices and 2) forecast that relationship into future years when the support price program no longer exists resulting in an unreliable price relationship outlook.

US exports are another example of momentous differences between January 2000 to August 2017 and May 2019 to June 2023. In 2006, the U.S. Dairy Export Council reported that U.S. processors exported 9.2% of milk solids, which expanded to 14.5% by the end of 2017 (U.S. Dairy Export Council, 2023). From 2019 to 2022, exports grew from 14.5% of milk solids to 18%. The growth of U.S. exports across all dairy products has been tremendous and beneficial to the industry. But, again, the comparability of growth between 2000-2017 and 2019-2022 are vastly different. Further, the growth rate of exports by product category over the last five years is unlikely to inform the growth rates by product through the end of the decade. Implicit in the current Average-of price is the impact of US dairy product trade – accelerations, decelerations, and product mix. Last year, the United States exported approximately 77% of all NDM and skim milk powder ("SMP") produced, compared to 21% of cheese. Given the absolute volume of today's total exports and capacity expansion focused on cheese, US cheese exports could likely expand faster than NDM through the end of the decade. That shift in sales mix could impact the Class III and IV skim milk prices at different levels compared to today.

The list of non-recurring events over the last two decades is extensive. For example, the 2014 end of raw milk production quotas in Europe and the implementation of the new Common Agricultural Program

("CAP") (2023-2027), the 2020 global pandemic, rising domestic cheese consumption, and investment, to name a few. While no formula can be expected to be highly predictive under all circumstances, the deficiencies of the Average-of formula are extensive as any one historical period is unlikely to be predictive or reflective of future market conditions as there are too many variables that can alter the relationship between Class III and IV skim milk. There is no structure to establish or maintain a relationship between the Class III and IV milk prices. Absent a formula that creates a stable relationship between the Class III and IV skim milk prices, the Average-of may lead to delayed, muted, or overstated market signals that create volatility by transmitting inaccurate information to participants about the current market supply and demand balance, leading to inferior FMMO function – that has implications for risk management. Furthermore, the positive skew indicates that dairy producers, more than processors, are likely to feel the brunt of any inequity.

2.5. Can stable prices stem milk consumption losses

There are a few arguments posited as to why hedging Class I milk is beneficial to the overall market: 1) the trade-offs necessary for Class I risk management can be shared equally among market participants, 2) more stable Class I milk prices could slow bottled milk per capita consumption losses, and 3) dairy producers and processors have access and can participate in risk management. Point 1 was addressed in Section 3.1, but the data does not conclusively support that the Higher-of versus Average-of benefit is equally distributed among processors and producers. Therefore, it is important to understand the other two suppositions, starting with Class I price stability and risk management's ability to slow or stem consumption losses. The concept - greater ability to manage Class I price risk could reduce price variability and retain more consumers – like the bottled water example noted in the IDFA "Floored Class I Mover" (Proposal 14).

In October 2021, USDA's Economic Research Service ("ERS") published a report examining the decline in per capita fluid milk consumption from 2003 to 2018 (Hayden Stewart, 2021) –a similar period to that of the Average-of analysis (January 2000 to August 2017). The study concluded a few things: 1) U.S. consumption of cow's milk has been trending lower for 70 years, 2) recent downward trends in consumption are more than demographics or generational changes, and 3) there may be other items like choice, taste, preference, competition between cereal and other alternatives for breakfast, etc. impacting consumption.

Little data suggests that consumers place more weight on price relative to other attributes like local, organic, lactose-free, high protein, taste, etc.; price may be a consideration but not the defining factor for consumer bottled milk consumption trends. For example, on July 5, 2023, Aldi's website posted milk prices for a store in Decatur, IL (**Dorland Exhibit 7**). This is not unique to Aldi's outlets; the data was easily accessible for demonstration purposes. After converting a sampling of reduced-fat (2%) milk products to gallon equivalents, it is apparent that the gallon of high-temperature-short-time ("HTST") milk was the lowest price compared to ultra-filtered, lactose-free, organic, and almondmilk products (**Dorland Exhibit 8**). The comparable products were 170% to 388% more expensive than a gallon of 2% HTST milk – these are also product categories that have experienced considerable growth over the past decade while HTST milk consumption continues to decline. For example, the Dairy Foods 2022 "State of the Industry" article noted that Fairlife unit sales were 12.8% more than the previous 52-week period ended Sept. 4, 2022. Similarly, Organic Valley unit sales were up 5.2%. The overall category was down 3%. (Berk, 2022 State of the Industry: Milk sales experience ups and downs, 2022) Data suggests consumers consider a myriad of criteria when making bottled milk purchase decisions and, in some cases, are willing to pay premiums above the HTST gallon price, which may drive growth for some sub-categories of fluid milk. Because consumers are willing to pay substantial premiums above HTST gallon jug equivalent prices, and the volumes for those products are growing annually, it appears to confirm the USDA study – there are factors in addition to price that may impact purchase decisions. Using USDA's AMS Retail Milk Prices Report, between January 2018 and July 2023 whole milk gallon jug prices were, on average, stable for prolonged periods, excluding January 2022 to June 2022.

Despite modest price changes for gallon jugs at retail, per capita consumption losses continued, excluding the period marked by the pandemic (**Dorland, Exhibit 9**). Again, there is an implicit assumption that consumers are informed about markets and are reacting to price swings. Further, comparing the Class I base price adjusted to a 3.25% butterfat gallon, to the retail milk price – the latter typically reflects a fraction of the month-to-month raw milk price change suggesting the system reduces some of price volatility (**Dorland, Exhibit 9**). USDA's Economic Research Service reached a similar conclusion – whole milk prices, when inflation adjusted were similarly priced from the start of the study period (2003) and the end (2008). Over that span, consumption declined despite flat to lower retail prices (Stewart, 2021).

2.6. Risk Management

2.6.1. Class I risk management is complicated

Class I risk management is complicated for a variety of reasons. That is not to imply it is impossible, but rather, it is more difficult than other dairy products. Class I considers both manufacturing milk prices – Class III and Class IV – unlike other milk prices when establishing monthly values. That is for good reason: Class I milk price primacy is vital to attract milk to the pool each month. That creates a single Uniform Price and supports orderly milk marketing.

Furthermore, market participants would approach Class I risk management differently suggesting these impact of the Average-of would have different impacts on those business categories. For instance, a bottler may buy Class I milk and convert it to fat-free, 1%, 2%, or whole milk to sell to others as branded products, private label, or food service. Some Class I processors may have a national brand and an associated national pricing strategy – which would differ from private label processors' objectives and scope. Hedging raw milk purchases from farms differs in approach and risk from a retailer or restaurant attempting to hedge a 2% gallon. Finally, dairy producers that sell milk in an FMMO with Class I utilization could hedge that risk with forward contracts, swaps, futures, or options. For those reasons, I reviewed examples of each separately.

But, as mentioned earlier, the Class I skim price changes were pervasive and affected how dairy producers hedge Class II, III, and IV milk. Recall the FMMO is a system, and changes in one area can affect others. For instance, the implementation of the Average-of price resulted in extended periods of de-pooling, which adversely impacted dairy producers that hedged milk price exposure for the other classes of milk – most notably in 2020.

Ostensibly, the change to the Average-of skim price methodology was done to further risk management efforts. Unfortunately, it created a systematic risk that caused dairy producers to step back from risk management or employ less effective tools in response to the losses that resulted from de-pooling. Most of the market's sell-side liquidity still comes from producers (**Dorland, Exhibit 2**), suggesting changes that would cause dairy producers to reduce hedging activity across all classes of milk could be detrimental to markets.

2.6.2. What determines an effective hedge

Risk management is a series of trade-offs. When producers, processors, or end-users use a derivative to reduce risk – they are focused on reducing price or market exposures and the impact on sales, ingredient costs, milk prices, etc. While that proactive step may reduce market exposure, these groups may still have execution, credit, or liquidity risk; however, these firms perceived market risk as more impactful to their earnings and are willing to trade one risk for the other.

Additionally, a strong risk management program seeks to 1) reduce risk, 2) provide a predictable price, and 3) make the results repeatable. While most focus on the negative aspects of risk, risk can also create gains. However, unexplained gains that are not repeatable could subject those firms to future losses. Therefore, combining the Class I milk price (spot) and futures contracts (Class III & IV) should give the company a predictable milk price. That means that if a grocer were hedging its retail milk price exposure, an increase in the cash value of the milk price (higher costs) would result in an opposing move from the derivative (gain) and vice versa. There are times when all the aspects of the transaction do not align or when the markets and derivatives become more volatile, resulting in greater mismatch – in other words, it provides greater degrees of uncertainty in the outcome. Generally Accepted Accounting Principles ("GAAP") Accounting Standard Codification ("ASC") developed the standards for what is considered a highly effective hedge – a quantifiable measure well beyond an economic relationship between the commodity subject to risk and the derivative. To address that, GAAP requires 1) prospective and retrospective testing to validate the derivative's effectiveness to offset identified risk and 2) the correlation between the derivative and the underlying risk must be highly correlated, defined as 80% to 125%. Even if opting out of hedge accounting, the economics of a hedge could be questionable if correlations fall outside the standards set above. Practitioners rely on correlations because they provide an understanding of how prices move in relationship to each other – it provides a greater ability to rely on the tools and ascertain the information relayed through the futures curves (**Dorland, Exhibit 5**).

But before buying or selling derivatives, managing risk requires proper identification and categorization of risk exposures. For instance, if a processor buys Class I milk and sells bottled milk to a grocer based on the Announced Class I price – there is limited risk for the processor. That is a basis-to-basis match that would not expose the processor to risk – suggesting if that processor transacted a derivative, they would introduce risk to their system. A processor buys Class I milk and sells a branded product with a national pricing program (fixed price) may have risk. Or a restaurant buys 2%-gallon milk and has a fixed menu price. Those are basis-to-fixed prices – a mismatch that may merit risk management. In 2022, Dairy Foods reported private label milk sales at 2.68 billion units – accounting for approximately two-thirds of retail sales. Based on my experience, private label sales are typically basis sales – where the Class I price passes through to the end product, suggesting processors have limited risk. The grocers may have some risk, but, again, based on experience, these groups are less likely to fix bottled milk prices – they risk being off the market, which could forfeit milk sales – still one of the top reasons consumers go to the store and one that results in additional purchases. That suggests up to one-third of retail milk unit sales could evaluate risk management. Food service and institutional Class I milk uses could also consider risk management.

Based on those goals, I created a few hypothetical hedges to evaluate whether the Average-of price and how it may or may not support risk management and whether Average-of risk management provides superior results.

2.6.3. Hedge example: Hedging the Producer Settlement Fund (organic milk)

Organic milk, one of the growth categories since 2019, may be less likely to employ Class I risk management as ”most organic milk is purchased on long-term forward contracts.” (Congressional Research Service, Updated June 15, 2022). The rationale for processors’ and retailers’ Class I risk management was establishing a fixed cost to avoid market fluctuations that would alter the shelf or menu price. Buying fixed-price milk via a purchase contract would offset those risks, eliminating the need for additional risk management.

“AMS treats certified organic and conventional milk the same for minimum pricing and pooling under the FMMO system.” (Congressional Research Service, Updated June 15, 2022) As a result, organic Class I processors may be obligated to the FMMO for the difference between utilization and the Uniform price - handler obligation to the producer settlement fund. Organic milk is distributed nationwide, implying that some plants “occasionally market fluid milk in the order.” (Congressional Research Service, Updated June 15, 2022) That could trigger 7 C.F.R 1000.76(b) – the “Wichita Option,” which permits partially regulated handlers an exemption from paying into the producer settlement fund if they can “demonstrate that they pay producers more than the FMMO uniform price.”

Organic processors pay a forward contracted milk price to organic dairy producers and, in some but not all cases, an equalization payment to the Producer Settlement Fund – comprising the total milk price obligation. Some may argue that while the fixed-price milk is a hedge of the retail price and unlikely to participate in risk management, there could be hedge opportunities related to Producer Settlement Fund or equalization payments. However, milk subject to the Wichita Option should also be excluded from the milk eligible for a hedge as the exemption permits the organic handlers to pay the forward contracted price only; based on November 2021 data (**Dorland, Exhibit 10**), that could be 10-20% of total organic milk production. In 2022, organic milk sales totaled 2.85 billion pounds and were 6.6% of U.S. fluid milk sales. (USDA Agricultural Marketing Service, 2022) For milk organic processors consider hedging may account for up to 3.2 billion pounds of milk or 1.4% of 2022 total U.S. milk production.

The question remains whether the Average-of pricing methodology supports Producer Settlement Fund or equalization payment hedging. This is a complicated Class I hedge variation as it attempts to use the Class III and Class IV milk futures to hedge to mitigate the Producer Settlement Fund obligation. To simulate an equalization payment hedge, I developed a hedge for a processing plant in Dallas County, TX (FMMO 126), assuming a rolling 90-day hedge using the weekly average Class III and IV futures price (**Dorland, Exhibit 18**). The premise of the hedge – changes in the Class III and IV milk futures will offset changes in the organic processor’s Producer Settlement Fund obligation –a cash flow hedge. This hedge attempts to manage the price change between the Pool Value and the component value rather than the change in the Class I price – a challenging proposition. That means seasonal use variations, de-pooling, divestitures, investments, etc., would impact the results as those items can influence the Pool Value. The correlation between the assumed organic processor’s equalization payment change and the Class III and IV milk futures price changes was a fraction of one percent – implying little to no relationship between the hedged item and the derivatives. In all cases, the post-hedge milk price was higher than the forward contracted milk price, and half the time, the hedged price was the highest price, indicating risk management added to costs rather than mitigating them.

Based on the hypothetical hedge, an organic handler's attempts to use Class III and IV milk futures to hedge equalization payments are unpredictable and unlikely to mitigate costs while doing little to stabilize milk prices and drive consumption, as the Average-of trade-off assumed.

2.6.4. Hedge example: Hedging 2% gallons at retail (Average-of vs. Higher-of)

I developed two examples correlating a 2% milk hedge with one based on Class I Average-of pricing to Class III and Class IV futures (**Dorland Exhibit 11**) and the other a 2% milk hedge based on Class I Higher-of pricing to Class III and IV futures (**Dorland Exhibit 12)**. The exhibits detail the methodology for setting up the 60-month correlations (January 2018 to December 2022). Interestingly, the result of Class III to 2% milk price based on the Average-of price was 88%, and Higher-of was nearly 92% - a relatively close performance. The high correlations are intuitive because the Class III price was higher than the Class IV price 41 of 60 months. Further, under the Average-of scenarios, when Class III was considerably higher than Class IV (a $10.78 difference in August 2020), the Class III futures price change would have followed the Class I price change directionally. Still, it would have resulted in a futures contract loss that the 2% milk cost would not have offset due to the averaging with a significantly lower Class IV value. Class IV under the Average-of was 71% correlated to the Class I milk price and 45% under the Higher-of. In both scenarios, Class IV was an unsatisfactory economic hedge of Class I milk and would be deemed ineffective for hedge accounting purposes. The outcome is reasonable given the Class IV milk price was higher in 19 of 60 months and that Class IV futures gains would have done little to offset higher milk costs in months when the Class III price was substantially higher. The results were similar when adjusting the butterfat levels of the fluid milk product with skim or fat-free milk performing the worst for both Class III and Class IV in each scenario due to the mismatch with butterfat in the futures contract compared to the 0% butterfat milk. The Class III hedge was highly correlated under most scenarios; however, the Average-of versus the Higher-of differences were minimal and fell short of justifying the US dairy industry remaining on Average-of pricing if no other benefits are achieved.(It should be noted that the analysis does not imply that Class III is a superior derivative for hedging Class I milk compared to Class IV, but rather at that time, Class III was higher more often than Class IV; the opposite can also be true (see 2022 to present).

2.6.5. Hedge example: Why few dairy producers can use Class I risk management

Few dairy producers should consider hedging Class I exposures in milk checks with futures and options contracts as risk management employing those tools is complicated. Congress continues to authorize the Dairy Forward Pricing Program ("DFPP") and "[f]orward contracts continue to be restricted to Class II, III, and IV milk." (Congressional Research Service, Updated June 15, 2022) Under DFPP Class I forward contracting would be prohibited, but that does not extend to over-the-counter ("OTC") markets like swaps or forward contracts between dairy producers and cooperatives under the FMMO minimum payment provision and futures and options markets. OTC contracts can be appropriately sized and designed for a single settlement, whereas futures and options are standard sizes, meaning the dairy producer needs to calculate the minimum monthly milk deliveries that will satisfy Class I hedging requirements to avoid risk creation.

To help demonstrate the complications related to dairy producers' hedging Class I milk prices, I used FMMO 7, FMMO 1, and FMMO 30 as representative samples of high, medium, and low Class I utilization (**Dorland Exhibit 13**). Dairies should undertake Class I hedging to the degree it impacts their milk price –

meaning if Class I utilization is 30% of the Uniform Price, as that is the basis of payment for the dairy, it should avoid hedging more than 30%; otherwise risk may be created. Class III and IV milk futures and options contracts are 200,000 pounds each. Therefore, when using Class III and IV milk futures contracts to hedge Class I risk, there is another condition: Class I milk hedges should be done in 400,000-pound increments to simulate the 1:1 ratio of Class III and IV milk to mimic the Average-of Class III and IV relationship. Based on those two conditions, a Florida dairy should have approximately 290 cows to hedge Class I milk (**Dorland Exhibit 13**), which is simply the calculation of 400,000 divided by the Class I utilization for a month divided by the average output per cow in Florida [January: 400,000/.826/1800 = 269]. A New York dairy should have approximately 650 cows to hedge Class I milk. A Wisconsin dairy should have approximately 2,826 cows to hedge Class I milk. Lower Class I utilization and a minimum of 400,000-pound increments result in much higher monthly milk production requirements for Wisconsin vs. Florida. Most dairies hedge less than 100% of their risk, implying the minimum size of the farm would increase to meet the Class I hedge requirements compared to the example above.

Using the smallest figure derived from Florida's analysis – dairies with fewer than 200 cows should not entertain Class I hedging as the dairy could be exposed to additional risk created by a mismatched hedge. Based on USDA-ERS, "Consolidation in United States Dairy Farming" (**Dorland Exhibit 14**), in 2017, that would have eliminated 87% of the nation's dairies from accessing Class I hedging contrary to several Class I formula proposals. As part of the 2018 Farm Bill, AMS stated, "The change in the Class I price formula applies uniformly to both large and small businesses" (USDA-AMS, 2019) based on industry-provided calculations and data. Unfortunately, analysis of Class I hedging access undermines the premise that the Class I formula change would not negatively impact smaller dairies and that many dairies can use Class I hedging. Further, larger dairies paid under cheese milk or cheese yield methodologies and those in unregulated markets should avoid using Class I hedging as it may not relate to the underlying milk price and, therefore, the derivative price change would not offset changes in the value or cash flows from a milk check.

With most dairy producers unable to access Class I risk management, it weakens the basic tenets of the Average-of proposal, and that of several proposals up for consideration – both dairy producers and processors have access to Class I risk management.

2.6.6. Unintended consequences of the Average-of that affected hedging

The Average-of price proposal focused on what it could do for dairy producers and processors by increasing the availability of Class I milk. But to reiterate, the expectations of the results were that the post-implementation period would look like the evaluation period – see Sections 2.2 and 2.3. Hindsight being 20/20 that did not occur. While the Average-of resulted in greater dairy producer contributions, it also created prolonged periods of de-pooling that adversely impacted dairy producer hedging for Class II, III, and IV milk prices resulting in significant and undocumented losses.

Headed into 2020, I worked with dairy producers to secure milk prices and lock margins. We sold Class III milk futures, entered collars (bought puts/sold calls), or sold milk through cooperative forward contracting programs to provide stable margins. What would ensue in Q2 2020 and the price volatility that followed wasn't predictable. Because the Class III milk price was so high relative to the forecasted Uniform Price in FMMO 30 and elsewhere – processors de-pooled. For dairy producers that hedged, as they should to protect margins, the rug was ripped out from under them. Fundamental to risk management, changes in the hedged item (milk price) should be offset by the derivative and vice-versa –

see Section 2.6.2. The derivatives performed as expected – lower contracted prices resulted in losses that higher milk prices should have offset to return near the expected price. But, because Class III milk was removed from FMMOs, the proportion of Class III milk changed, resulting in producers significantly over-hedged. Adding insult to injury, dairy producers that hedged and relied on the FMMO to perform as it had historically, wound up with lower price prices and significant derivate losses that became additive vs. offsetting.

Although the possibility of de-pooling has existed since federal order reform – the Average-of-Class I skim price created de-pooling opportunities that lasted for months rather than short intervals as the prices recalibrated to catch rapidly appreciating markets. Further, the Average-of price change saturated the entire market, potentially impacting all dairy producer hedging activities.

2.7. Summing up the current Average-of versus the Higher-Of

Since implementation, the Average-of Class I price formula fell short of all its stated objectives: 1) the differential would be shared equally by dairy producers and processors over time, 2) more stable Class I milk prices could slow bottled milk per capita consumption losses, and 3) dairy producers and processors have access to Class I risk management. Unfortunately, those failures weaken many of the FMMO fundamental objectives articulated throughout this review, ultimately hurting dairy producers and causing the system to malfunction by transmitting historical data into current markets. While many aspects of the operating environment have changed over the FMMO's nearly 100-year tenure, the fundamental reasons for establishing the system have not. Ultimately, everyone is here today because all are proposing alternatives to the Average-of milk price, acknowledging that the current formula is ineffective and has caused the FMMO milk pricing process to function less efficiently, as no proposals advocate for the status quo. For those reasons, and the evaluation provided, the USDA should consider a return to the Higher-of-Class I skim milk price formula as noted in Proposal 13.

3. Evaluation of the Class I Mover Proposals

3.1. Most of the proposals are iterations of the Average-of

While Proposals 14, 15, and 16 attempt to tackle the Class I skim price with slightly different approaches, at their core they are iterations of the current Average-of price formula. Although Proposal 16 purports to be a Class III Plus – the Plus is determined by comparing the Announced Class III skim milk price to the Higher-of over a 36-month period. In each instance, these proposals tether the Class III Plus/Average-of skim price determination to the Higher-of price. At its most basic, every proposal concedes that the Class III Plus or Average-of 1) cannot adequately replicate the Higher-of price in future periods and 2) is not shared equally among dairy producers and others, necessitating a periodic recalibration. Rather than recognizing the limitation of the Average-of formula and what prevents the price from imitating the Higher-of performance - these proposals suggest additional steps to align the Average-of and Higher-of formulas and distribute costs between processors and producers. As discussed in Sections 2.3 and 2.4, absent a defined relationship between the advanced Class III and IV skim milk prices, any variant of the Average-of formula will struggle to replicate the Higher-of performance, resulting in disproportionate risks for dairy producers and distorted market signals that undermine efficient FMMO function.

3.2. Averaging increases information friction and is inequitable

The proposals' steps to recalibrate prices disrupt the timely communication of market signals to participants, as the information would be years in arrears. The new methodologies offer 24-month to 36-

month lookbacks to determine the adjustment that should be incorporated into the Class I skim calculation. At its core, these lookback approaches are inherently flawed as they attempt to apply past performance to future periods, which may or may not accurately reflect current market conditions. Additionally, it conflicts with the FMMO milk pricing system design methodology. “Class I fluid milk usually receives the highest minimum price under the federal order system. This helps to encourage the movement of milk from milk-surplus areas into milk-deficit areas and ensure supply of fluid milk to meet peak demand.” (Congressional Research Service, Updated June 15, 2022) When commodity markets move up, like in 2020 and 2022, the Higher-of can lag temporarily but is designed to adjust to market conditions quickly. Based on Proposals 14, 15, and 16, higher milk prices in 2020 and 2022 would not influence Class I milk prices until years after the market signaled it needed to draw surplus milk for bottling needs. Further, every period would impact two to three years future adjustment. For instance, January 2022 would influence Proposal 14’s “adder” calculations in 2023 and 2024. That could obscure market signals as echoes of past markets would influence current prices, making the price haphazard and potentially irrelevant, contrary to efficient markets.

During the 2008 mandatory reporting review, there was an active debate about the 30-day limit on reported prices and sales. The final rule published in FR E8-13550 stated, “The availability of accurate market data for all market participants is extremely important. Buyers and seller of the basic dairy commodities, and indeed, the buyers and sellers of all dairy products depend on the accuracy of the prices affected by this final rule to provide them a sense of the current supply and demand conditions in the dairy sector. Improvements in the quality of price information of the basic dairy commodities—butter, cheddar, cheese, nonfat dry milk, and dry whey—were made by the interim final rule. This final rule makes certain amendments which further enhance the quality of such price information.” Proposals 14, 15, and 16 contradict widely accepted industry policy and norms that timely information is necessary for proper market function by proposing historical price relationships that are suitable to inform participants about current supply-demand conditions and market dynamics. At times, that may lead to prices that no longer reflect current supply-demand, creating confusion that could exacerbate price volatility and, ultimately, create disorderly market conditions.

Further, as demonstrated in Section 2.6.6. Class I milk prices disconnected from current market conditions can promote prolonged periods of de-pooling, leading to disorderly market conditions that can adversely affect dairy producers’ risk management activity.

3.3. Proposal 14 - “Floored Class I Mover”

IDFA submitted Proposal 14, a “Floored Class I Mover,” for consideration, suggesting it “(a) preserves the purposes that led to the Class I mover being changed to its present language on May 1, 2019, (b) encourages increased sales of Class I products, which have been in steady decline for many years, and (c) is guaranteed to put more dollars into the pockets of dairy farmers.” While admirable goals, the proposal fails to address the steps necessary to achieve the targets and appears to rely on the 2018 Farm Bill analysis that 1) failed to meet the agreed-upon conditions for Average-of versus Higher-of pricing, 2) has not mitigated fluid milk consumption declines, 3) distorted market signals causing prolonged periods of de-pooling, and 4) resulted in disproportionate dairy producer contributions to the Average-of Class I mover formula, depressing dairy producer income frequently.

The “Floored Class I Mover” boldly states it “encourages increased sales of Class I products” without evidence that the current Average-of formula has done anything to increase bottled milk consumption.

USDA per capita fluid consumption data between 2019 and 2021 dropped from 141 pounds to 134 pounds, apart from the pandemic impact (USDA - ERS, 2022). Consistent with the USDA study, price is an attribute of fluid milk that may influence consumer purchase decisions, but it does not stand alone – see Section 2.5. Absent quantifiable data that can be reviewed, the statement fails to explain how the "Floored Class I Mover" proposal will translate into more bottled milk sales.

Based on the formulas provided in each proposal, I compared each result from May 2019 through July 2023. In four years of monthly comparisons, the "Floored Class I Mover" resulted in the highest price in – 2022 and year-to-date 2023. (**Dorland, Exhibit 15**) In a year with historically high prices, the "Floored Class I Mover" skim value would have been $1.05/cwt more costly than the current skim price and 43 cents/cwt more than the Higher-of in that year. That is followed by the year-to-date 2023 where the the "Floored Class I Mover" is again the highest price through July. However, going into 2024, the "adder" will go from $1.52/cwt to $0.94/cwt. Over the past two years, Proposal 14 performed well because it reflected higher markets between 2020 and 2022. But, as those higher price years roll-off, the "adder" could drift to the $0.74/cwt level – a price that has underperformed alternatives in most markets. Further, the market dynamics of 2024 may be different relative to the lookback period from August 2021 to July 2023.

3.4. Proposal 15 - "Rolling Adjustor"

The Milk Innovation Group ("MIG") Proposal 15, a "Rolling Adjustor," purports to "give updated market signals to producers to produce milk at the appropriate rates" but then concludes the paragraph by stating, "It [Roller Adjustor] also makes it easier for processors to absorb that level of month-to-month volatility since it dampens the over impact of the changes in any given fiscal quarter/year versus the prior year." Those two statements appear to be mutually exclusive. No analysis was provided of historical data. Furthermore, one of the primary arguments for Average-of pricing is risk management; however, reducing market volatility negates risk management needs and undermines the overall justification for Average-of versus Higher-of pricing. Further, if processors benefit from dampened volatility, it is logical to conclude that dairy producers are underwriting that risk mitigation.

The FMMO system is often derided for built-in lags that undermine the timely transmission of data – and those are two to six-week delays. Consider Proposal 15 suggests January 2020 to December 2021 Class III and IV skim milk prices communicated to dairy producers in December 2022 is "updated market signals." Arguably, January 2023 Rolling Adjustor Class I milk price at $12.29/cwt was higher than alternatives that would signal markets required more milk – a time when global markets were slowing, and Dairy Market News reported, "Milk supplies are readily available throughout most the country, with stakeholders indicating no shortages of milk." (AMS, 2022)

Further, rather than muting volatility, Proposal 15 appears to exacerbate it. Proposal 15 tends to be on the low end of the annual average when prices are low. The converse is also true. If the formula were effective at reducing volatility, I expect to see prices move less compared to other prices, not more. Both Proposals 14 and 15 benefit from incorporating higher markets from 2020 and 2022 in the demonstration period. When extending the analysis period to next year, the "adder" and "adjustor" drop as higher-priced markets roll off. That confirms neither formula has improved upon the Average-of price and are subject to the same pitfalls as nothing in the proposals address the inability to regulate the Class III and IV skim milk price relationship.

3.5. Proposal 16 – "Class III Plus"

Edge Dairy Farmer Cooperative ("Edge") submitted Proposal 16, a "Class III Plus." This proposal is unique as the difference between the announced Class III skim and Higher-of milk prices can be positive or negative. This would indicate when Class III skim is higher than Class IV the adjustor factor would be negative. Again, admirable goals that "guarantee revenue neutrality" to the Higher-of. While the proposal indicates the adjustor could never be negative, the proposed CFR language does not appear to prevent that from happening. Given the link to the Class III skim price, if the Class III price remained above the Class IV prices for a prolonged period, it would be possible to achieve a negative adjustment. Following the formula as written, the 2021 36-month average would have been -$0.21/cwt. The proposed language – compares the Higher-of the advanced Class III or IV price to the announced Class III, resulting in the calculation issue somewhat codifying the very problem the proposal was attempting to avoid.

FMMO 30 had the highest-Class III utilization at 91% in 2022 (see Table 2), significantly more than the all-FMMO average of 53.94%. As the Class I base milk price is national, consideration for all utilization is important to remain relevant and to attract milk from surplus to deficit areas when needed. The "Class III Plus" is Midwest-centric and fails to address how employing a "Class III Plus" mover would prevent disorderly marketing in orders with higher Class II or Class IV utilization; in fact, it seems the opposite would be true. A "Class III Plus" price would increase the likelihood of de-pooling more than the Average-of employed today as the proposal fails to recognize two classes of manufacturing milk.

While this formula may work when Class III milk prices are higher than Class IV prices, it suffers from the same shortcomings as other proposals as it fails to recognize that there is no mechanism to regulate the relationship between Class III and Class IV milk prices. Between May 2019 and June 2023, the announced Class III skim milk price was higher than Class IV 63% of the time. That data point is incomplete because 37% of the time, Class IV skim was higher than Class III, and during those periods, a Class III plus-based contract could significantly underperform the market resulting in lower payments to dairy producers in high Class I utilization orders undermining a key facet of the FMMO – improving the income situation for dairy producers. Additionally, the analysis did not address the implications to the market and dairy producers if the Class IV price is above the Class III milk price for an extended time. Since November 2021 the announced Class III skim milk price exceeded the Class IV milk skim price 10% of the time. Again, this is a deficiency of all the proposals – past experience does not guarantee future performance.

The Class III Plus solution proposes it will eliminate disorderly marketing and "guarantee" it conforms to the Higher-of approach, that is all but impossible based on the data it provided for consideration and review. The proposal assumes all FMMO order utilization mimics that of FMMO 30, which they do not (see Table 2). In an FMMO like the Upper Midwest, relying on Class III skim to establish Class I would likely eliminate most, but not all, de-pooling. But, Class I utilization in that market was 6.88% in 2022 – meaning if that price were tied to the Class III skim – 97.8% of the milk would match Class III. The proposal is shortsighted as it fails to recognize different utilization throughout the country and the extremely limited Class I utilization in FMMO 30 that would not apply to other regions – especially those with higher Class II and Class IV utilization. Under this proposal, just over 2% of FMMO 30 milk would be subject to de-pooling if Class II or Class IV milk prices were higher than the uniform price; however, for the all FMMO average, that number would jump up to over 18% - with more extreme results in western FMMOs. Finally, the Class III Plus proposal would devastate FMMOs with high Class I utilization, like FMMO 6 when the Class IV milk price is substantially higher than the Class III milk price as dairy producers would not receive compensation for the higher milk price. Again contrary to the FMMO purpose to improve the income situation for dairy producers.

Like other proposals, the Class III Plus falls short of avoiding disorderly marketing conditions for fluid milk markets. Further, any backward-looking adjustment calculation that can be negative, especially one that spans 36 months, would be unlikely to transmit accurate market signals and could penalize dairy producers that supply the fluid milk market. The Class III Plus proposal falls short of addressing the shortcomings of the current Average-of and consistently underperforms the Higher-of price. Additionally, it has more weaknesses as it attempts to superimpose the Upper Midwest utilization and experience on the whole of the nation – which is inappropriate as its utilization is vastly different from other FMMOs and would be detrimental to most dairy producers.

3.6. Make whole efforts are flawed

Proposals 14, 15, and 16 appear to be contrary to a primary FMMO tenet - improving the income situation for dairy producers. While the lookback periods and adjustments methodologies vary, the proposal imply that monies in deficient periods may be distributed to dairy producers later. However, based on the current payment system, money could flow to dairy producers that 1) may not have been affected by earlier market disruption events or 2) by a different proportion. Absent a significant redesign, the current FMMO system cannot accommodate the "made whole" effort - a significant shortcoming of all proposals. Further, in the periods where the proposals underperform the Higher-of – there is no surplus collected from the market. The proposals do not detail how the process would ensure compensation to affected dairy producers, making the implications of a made-whole statement misleading.

The FMMO system is incapable of restitution to the affected parties for market inefficiencies, suggesting that for Proposals 14, 15, and 16 there is a must-be present-to-win methodology. In other words, the dairy producer adversely impacted in the "two prior twelve months periods from August through July" must still be in business in the current period to receive an "adder." Between 2003 and 2022 the nation lost 60% of its dairy operations. (**Dorland, Exhibit 16**) USDA reported that between 2020 and 2022, there were 3,720 fewer dairies, meaning some of those dairy producers may have been impacted by these price proposals to the point of closing their dairies. Under the Higher-of formula, these dairy producers would have received timely Class I milk payments in 2020 and 2022 – for some, it may have made a difference. Under Proposals 14, 15, and 16, different dairies would benefit from restitution payments for the 3,720 dairies that closed, undermining the "made whole" assertion expressly stated in all of the proposals.

The cost misallocation between periods is not limited to dairy producers – it can also spread between orders and processors. For demonstration purposes, assume the Average-of payment in the two previous twelve months resulted in an "adjuster." Consider that in the current period, a dairy plant closed. In that FMMO, the Class I utilization could decline should no other facilities absorb the lost processing capacity. As a result, dairy producers in that FMMO would have lower Class I utilization in the "adjuster" period than in the affected period—another "made whole" failure. Similarly, if a bottling plant opened, the FMMO could experience a Class I utilization increase. If the "adjustor" or "adder" reflected a higher adjustment due to prices from several years ago, all else being equal, dairy producers in this order would disproportionately benefit from a disadvantage that may not have existed in the affected period. A new processor would be obligated to the Producer Settlement Fund at a higher rate, for which they received no beneficial offset in a prior period, resulting in market inequity. USDA's Economic Research Service

("ERS") reports the number of fluid milk plants annually. From 2008 and 2021, there were between 388 and 466 plants (**Dorland Exhibit 17**), indicating that these examples are likely to occur.

3.7. Risk Management

Proposal 14 suggests Class I risk management activity has increased since the Average-of pricing implementation. However, following the original analysis and Proposal 14 language more risk management opportunities were not the sole condition for switching to the Average-of, rather it was the hedging to slow or stabilize bottled milk consumption. The data doesn't appear to support that increased hedging activity has translated into a meaningful impact on overall bottled milk consumption trends. While price is a criterion for purchase decisions, it is not the only one and may have a limited impact when considering other factors – see Section 3.3. USDA ERS published fluid beverage milk sales by quantity annually. Between 2000 and 2017, sales of fluid beverage milk declined at a 1.02% compounded annual growth rate ("CAGR"); between 2019 and 2021, sales declined at a 2.07% CAGR (**Dorland Exhibit 8**). Since 2019, the data continues to point to factors other than price influencing purchase decisions. For example, from 2019 to 2022, organic milk sales increased by 9.3% (**Dorland Exhibit 9**), and other fluid milk went up by 243.6% per the AMS Estimated Fluid Milk Product Sales Report. Again, highlighting that some products that carry a premium to HTST gallon milk also demonstrated sales growth due to packaging, shelf-life, product characteristics, etc. Dairy Foods 2022 State of the Industry report confirmed that higher unit sales for brands like Fairlife +12.8% and Organic Valley +5.2% for the 52-week period ended September 4, 2022. (Berk, 2022)

Further, hedging milk at retail or in food service uses is not remarkably improved by migrating from a Higher-of pricing to an Average-of methodology – see sections 3.4.3 and 3.4.4. Finally, while there are statements implying dairy producers have ready access to Class I hedging, the analysis in section 3.4.5 indicates that most dairy producers cannot hedge the Class I risk in their milk checks using futures, options, OTC products, etc. Additionally, small dairy producers are at a distinct disadvantage – contrary to the evaluation of the 2018 Farm Bill changes.

4. Conclusion

Returning to the Swiss watch analogy, changing out the parts of a watch mechanism may seem simple – but if the gear, cogs, or spring is ill-fitting, it can cause the watch to stop winding. Without full winding, the watch will stop telling time properly, and eventually, the watch stops. In 2018, the US dairy industry swapped out a piece of the FMMO system – the Class I skim milk price formula and now the system is no longer working with the precision it once did, resulting in prolonged episodes of disorderly marketing caused by persistent de-pooling. Today, the US dairy industry is at a crossroads as it reviews how to establish the Class I skim milk price - revert to the Higher-of methodology, retain the Average-of, or embark on a path with a new methodology.

Each proposal attempts to replicate the Higher-of milk price with significant side effects. Based on my analysis, most proposals fall short of the stated goals and lack the ability to transmit current market signals to participants while retaining Class I primacy. In my opinion, there is only one pay price that successfully replicates the function and design of the Higher-of – it is the Higher-of milk price. Returning to the Higher-of milk price is familiar and assures the FMMO system returns to proper function by 1) transmitting market signals in real-time, 2) allowing for Class I hedging, 3) avoiding unnecessary complications of reimbursements that could disadvantage small-to-mid-sized dairy producers and further disrupt price signals to the market and 4) work within the current Federal Milk Marketing Order ("FMMO") structure and avoids the pitfalls of prolonged periods of de-pooling that can cause disorderly marketing.

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EXHIBIT 1: Sara Dorland CV

Sara Dorland

PO Box 2440 ● Sun Valley ● Idaho ● 83353
Sara.dorland@ceresdrm.com (206) 216-1918

www.linkedin.com/in/sara-dorland-0359683b

Education:

SEATTLE UNIVERSITY ALBERS SCHOOL OF BUSINESS / Graduate, MBA	2001
UNIVERSITY OF WASHINGTON FOSTERS SCHOOL OF BUSINESS / Bachelor of Arts	1995

Professional Experience:

MANAGING PARTNER / CERES DAIRY RISK MANAGEMENT LLC – Sun Valley, Idaho	2009 to Present
DIRECTOR OF RISK MANAGEMENT / DARIGOLD, INC. – Seattle, Washington	2005 to 2009
DIRECTOR OF FINANCE – INGREDIENTS DIVISION / DARIGOLD, INC. – Seattle, Washington	2001 to 2005
INTERNAL AUDIT MANAGER / DARIGOLD, INC. – Seattle, Washington	1999 to 2001

Professional Training:

HARVARD SCHOOL OF BUSINESS / Strategy & Competition Certificate ADVISOR: Michael Porter	Certificate

Professional Specialties:

Providing risk management, market research, and financial consulting services to agriculture and food-based businesses with a particular focus on the dairy industry to clients throughout the supply chain. Work includes collaborating with dairy producers, cooperatives, manufacturers, and consumer products companies nationwide.

Risk management activities involve a broad array of hedging activities, ranging from swaps and futures trading to go to market techniques for both domestic and international sales as well as education and consulting on a wide variety of dairy industry topics – ranging from "Introduction to Dairy" to business case analysis for dairy plants and milk shed analysis.

Project work includes input cost management for dairy farmers and processors including hedging of natural gas, corn, alfalfa, soy oil and work with fuel and resin contracts. Additionally, projects, on behalf of clients, comprised sourcing a vast array of milk and dairy products that have reduced supply chain costs. In addition to financial review for new U.S. dairy manufacturing investments.

EXHIBIT 1: Sara Dorland CV

Memberships in Professional Organizations:

U.S. Dairy Export Council
American Dairy Products Institute
Idaho Milk Processors
National Milk Producers Federation
National Women Business Owners Corporation
Dairy Management Inc. – Advising Board Member

Published Articles:

DAILY DAIRY REPORT	2012 to 2020
CHEESE MARKET NEWS	
Rocketing Cheese Prices	Jan. 2014
Butter Markets Continue to Rocker Higher	Jun. 2014
Cheese Market Article	Oct. 2014
A Year in Review	Dec. 2014
What Gives with Butter	Sep. 2015
Second Half of Year Likely Won't Disappoint with Its Own Revelations	Jul. 2016
PROGRESSIVE DAIRYMEN	
Market Article (Quarterly)	2019 to present
US DAIRY EXPORT COUNCIL	
Co-authored paper: The Dodd-Frank Act Amendments to the Commodity Exchange Act and the Impact On the U.S. Dairy Industry (Sara Dorland and Katie Trkla, Partner Foley and Lardner LLP)	Mar. 2012

Speaking Engagements:

International Sweetener Colloquium	Jan. 2018
Ag Choice – Farm Credit: Economic Update	Mar. 2018
U.S. Dairy Export Council – Reverse Trade Mission	May 2018
ADPI – Deep Dive on Price Discovery	Sep. 2018
ADPI – Risk Seminar	Nov. 2018
Idaho Dairymens' Annual Meeting	Nov. 2018
Compeer – DBA Webinar	Feb. 2019
Fusion Conference	Feb. 2019
US Dairy Export Council – Annual Meeting	Nov. 2019
ADPI Webinar	May 2019
Fusion Conference	Feb. 2020
StoneX Conference	Feb. 2020
ADPI Annual Meeting- Risk Management Panel	May 2020
ADPI Dairy Ingredients Symposium – Market Outlook Panel	Aug. 2021
ADPI 360 Degree – Risk Management and Logistics	Sep. 2021
ADPI Annual Meeting- Risk Management Panel	Sep. 2021
ADPI 360 Degree – Risk Management and Logistics	Sep. 2022
ADPI Risk Management Panel	Oct. 2022
IDFA Dairy Forum – Economics & Outlook Panel	Jan. 2023
ADPI Annual Meeting – Executive Panel	Apr. 2023

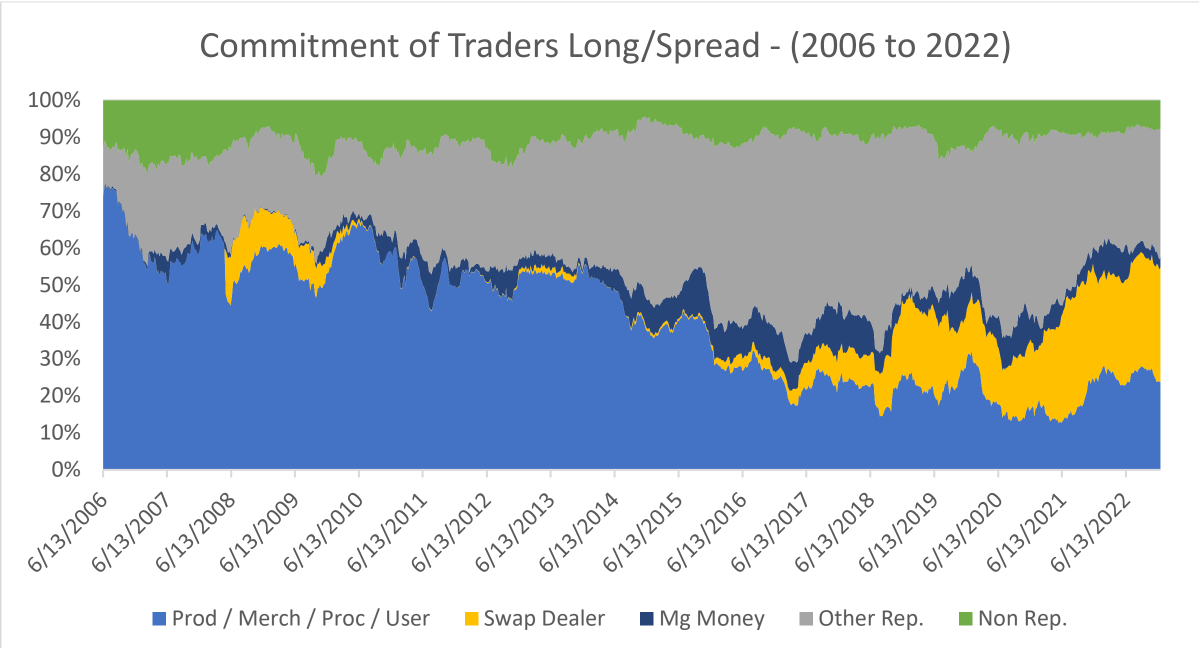
EXHIBIT 1: Sara Dorland CV

Recent Projects:

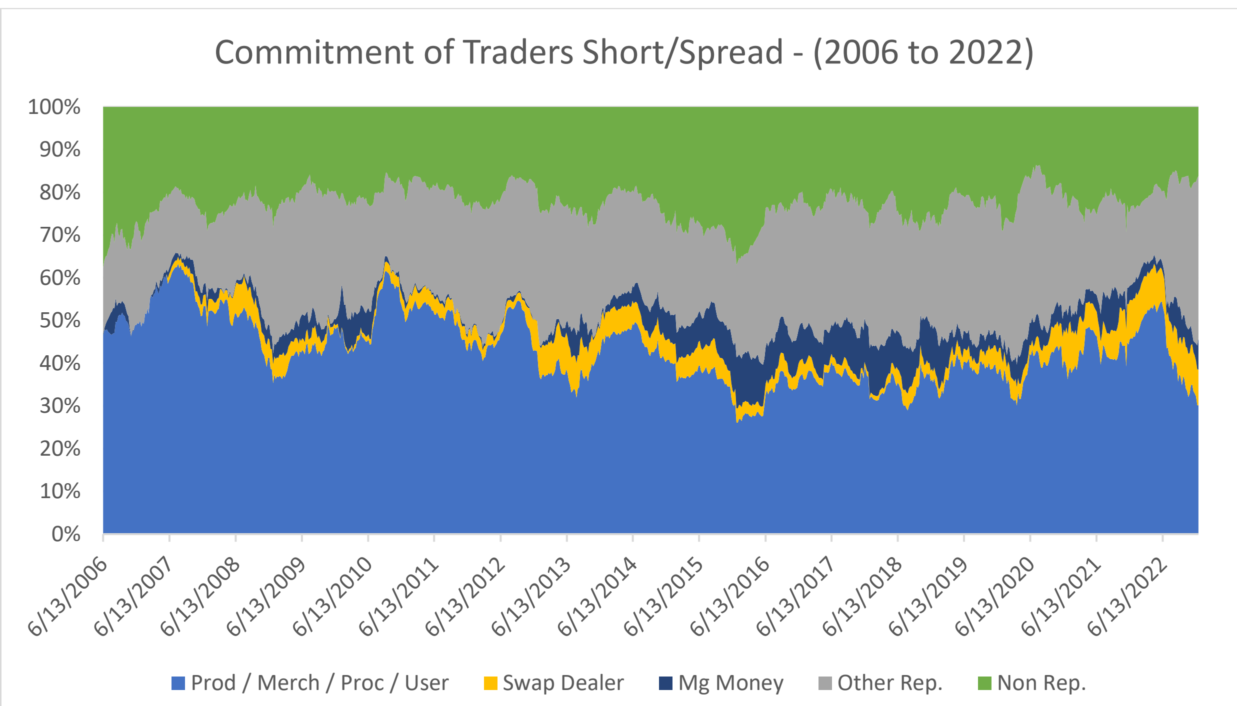
- Developed business case for milk plants in the United States
    - Includes review of location based on milk shed, environmental, competitive, and cost analysis
    - Location (2) the Central States, (1) Western States
    - Developed financial modeling for plant
    - Detailed business case and competitive analysis
        - Including a review of the cost of milk throughout the United States (regulated & unregulated markets) and impact on plant location
        - Environmental impact of dairy/processing expansion
        - Detailed review of competitors and customers
        - Market analysis
- Developed business case for cheese plants in the United States
    - Includes review of location based on milk shed, environmental, competitive, and cost analysis
    - Location (1) Western States
    - Developed financial modeling for plant
    - Detailed business case and competitive analysis
        - Including a review of the cost of milk throughout the United States (regulated & unregulated markets) and impact on plant location
        - Environmental impact of dairy/processing expansion
        - Detailed review of competitors and customers
        - Provide product mix & sales recommendations
        - Market analysis
- Developed business cases for milk powder plants in the United States
    - Includes review of location based on milk shed, environmental, competitive, and cost analysis
    - Developed financial modeling for the plant in (2) Western States and (3) Central States
    - Detailed business case and competitive analysis
        - Including a review of cost of milk throughout the United States (regulated & unregulated markets) and impact on plant location
        - Environmental impact of dairy/processing expansion
        - Detailed review of competitors and customers
        - Market analysis
- Developed business case for consumer products butter lines and other butterfat products
    - Locations (3) Western States and (1) Central States
    - Includes review of the location, sourcing, and costs analysis
    - Developed financial modeling for the facilities
    - Detailed business case and competitive analysis
- Developed business case for western states UHT production facility
    - Includes review of the location, sourcing, and costs analysis
    - Developed financial modeling for plant
    - Detailed business case and competitive analysis for domestic and global market
- System implementation
    - Review of the current Enterprise Resource Planning (ERP) systems with recommendation for implementing standard costing system vs. actual costing for a dairy manufacturing company
- Dodd-Frank regulatory review and analysis for impact on dairy risk management activities
- Review of Canadian supply management plan and potential impact of trade pacts on the system
- Review and analysis of federal and state milk marketing orders and implications for processors and how/where they market dairy products and their costs.
    - Included review and analysis of cost mitigation steps.
    - Review of order-order premium structure and impact on the project.
    - Verification of assumptions with respective federal milk marketing administrator.

EXHIBIT 2: CFTC Commitment of Traders

Commitment of Traders Long/Spread – (January 2006 to December 2022)



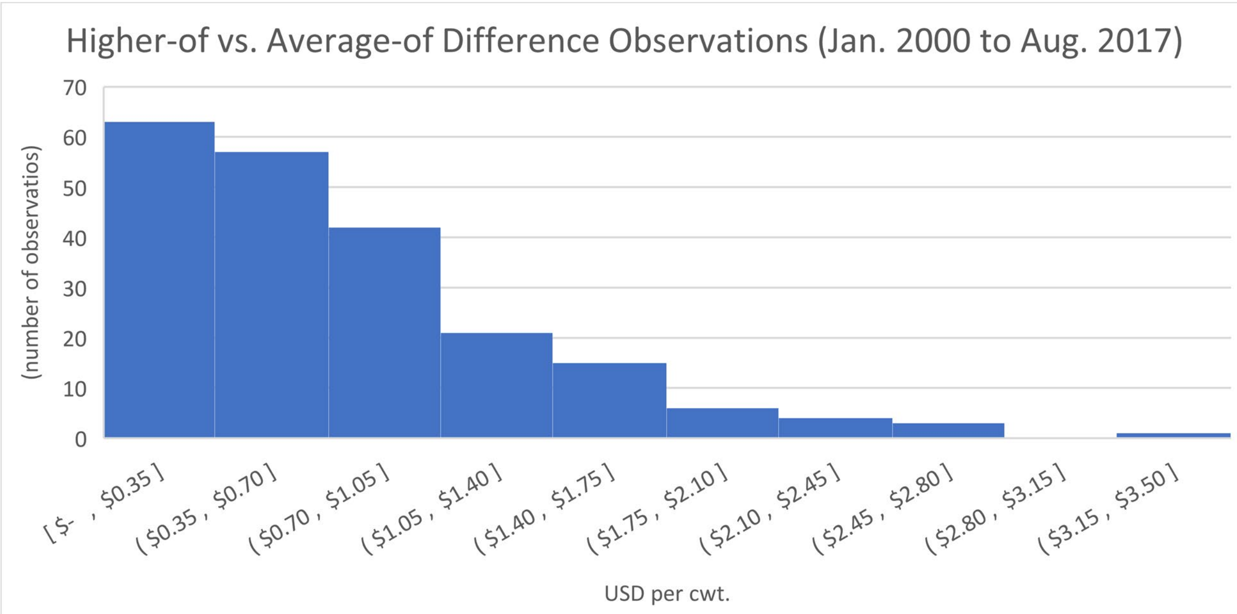
Commitment of Traders Short/Spread – (January 2006 to December 2022)



Source: CFTC, Futures and Options Combined Commitment of Traders Report (2006 to 2022)

EXHIBIT 3: Higher-of vs. Current Average-of Skim Milk Price Difference

The following histogram plots the number of observations, at denoted intervals, for the difference between the Higher-of and the Average-of Class I skim milk from January 2000 to August 2017



source: AMS Announcement of Advanced Prices and Pricing Factors

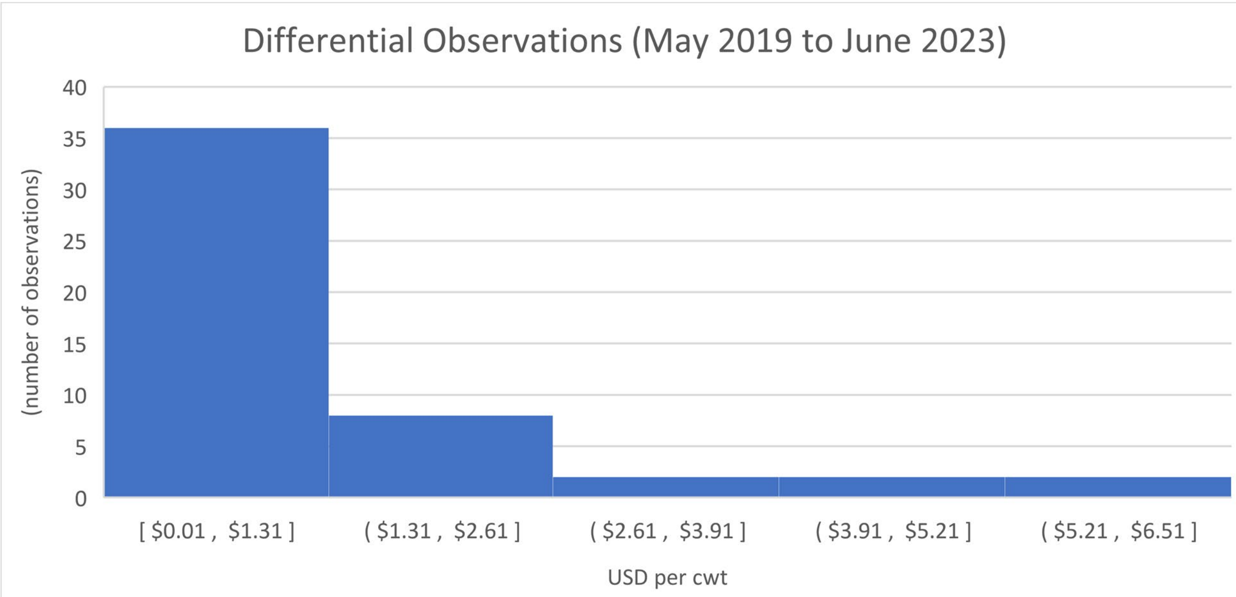
Jan 2000 to Aug 2017
Quartiles

Q1	$	0.2700
Q2	$	0.5900
Q3	$	1.0400
Q4	$	3.3800
Std Dev	$	0.591
Variance	$	0.349
Min	$	-
Max	$	3.38
Mean	$	0.74
Median	$	0.59
Mode	$	0.16
Processor Max	$	0.74
Producer Max	$	2.64

	Count	%	Avg.
Processor	126	59%	$ 0.26
Producer	86	41%	$ 0.48
Total	212	100%	$ 0.74

EXHIBIT 4: Higher-of vs. Current Average-of Skim Milk Price Difference

The following histogram plots the number of observations, at denoted intervals, for the difference between the Higher-of and the Average-of Class I skim milk from May 2019 to June 2023



source: AMS Announcement of Advanced Prices and Pricing Factors

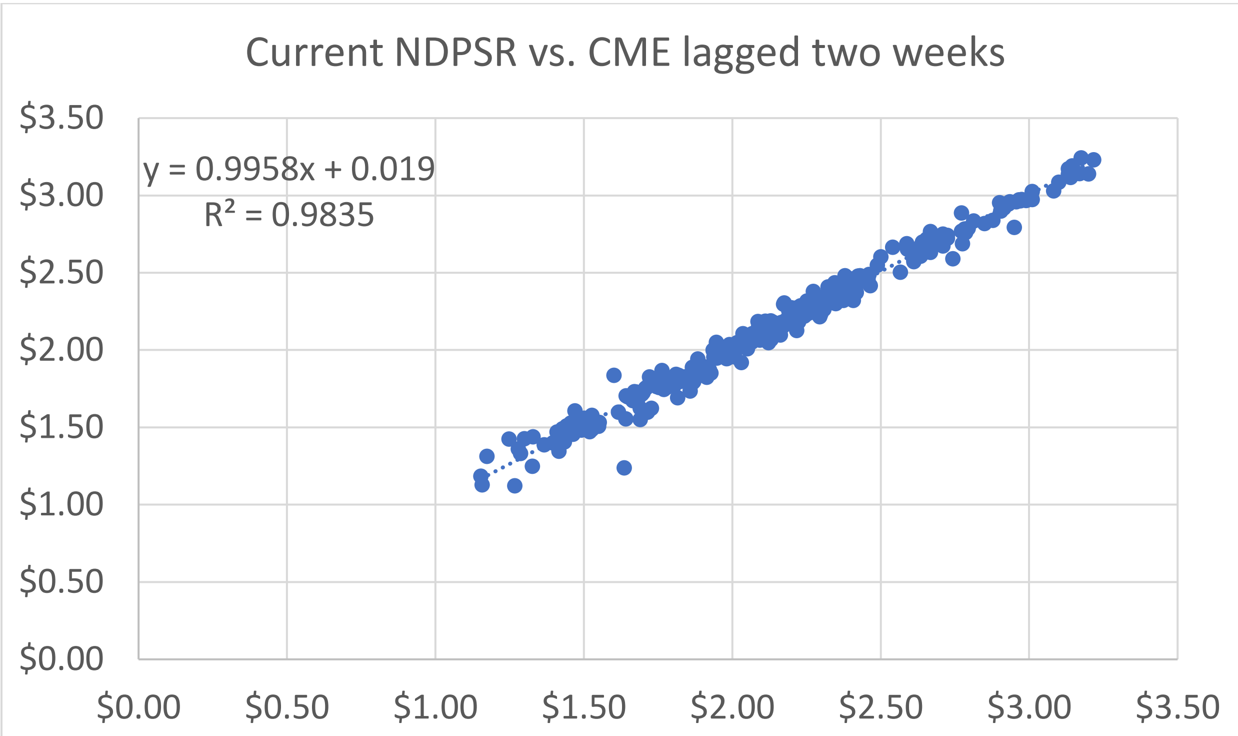
May 2019 to June 2023
Quartiles

Q1	$ 0.3650
Q2	$ 0.8750
Q3	$ 1.6275
Q4	$ 5.9300
Std Dev	$ 1.375
Variance	$ 1.891
Min	$ 0.010
Max	$ 5.930
Mean	$ 1.26
Median	$ 0.88
Mode	$ 0.34
Processor Max	$ 0.73
Producer Max	$ 5.19

	Count	%	Avg.
Processor	22	44%	$ 0.28
Producer	28	56%	$ 0.98
Total	50	100%	$ 1.26

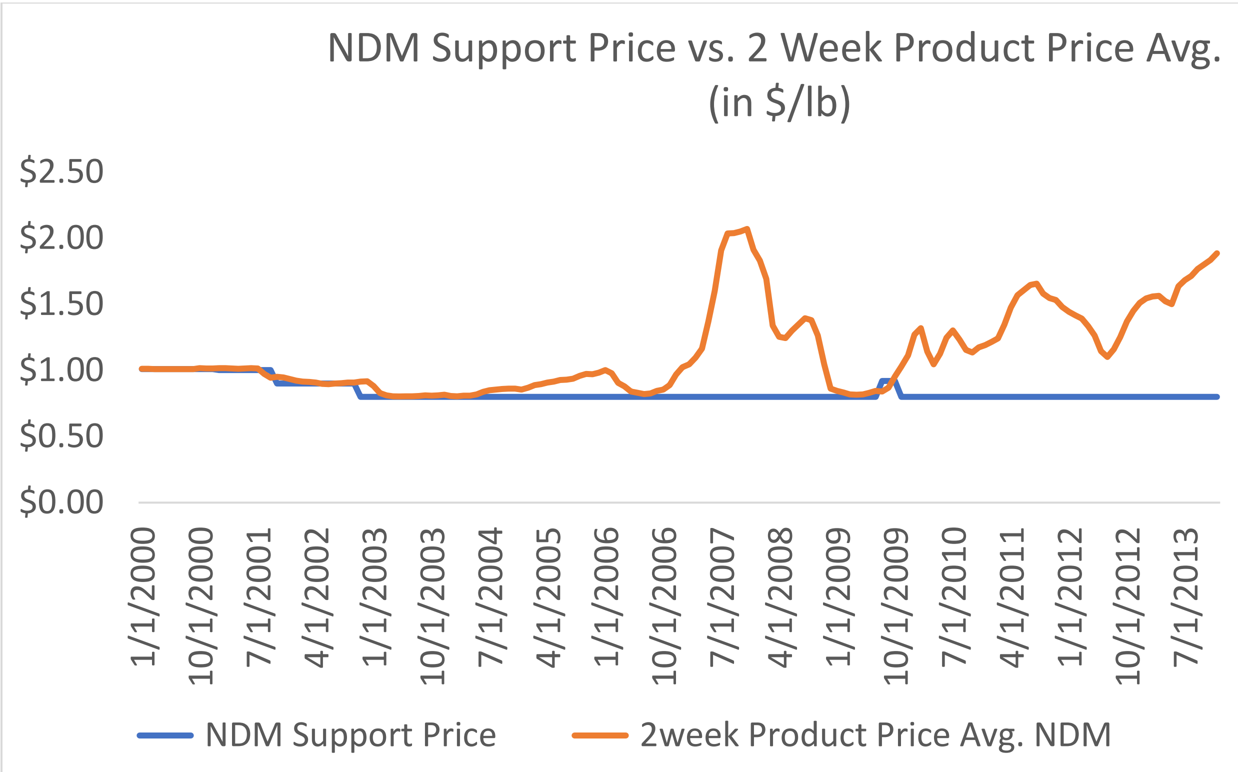
EXHIBIT 5: Correlation Weekly National Dairy Product Sales Report (NDPSR) Butter vs. CME Weekly Average Spot Butter

The chart below shows a regression comparing the current week's NDPSR butter price versus the CME weekly average butter price from two weeks prior.



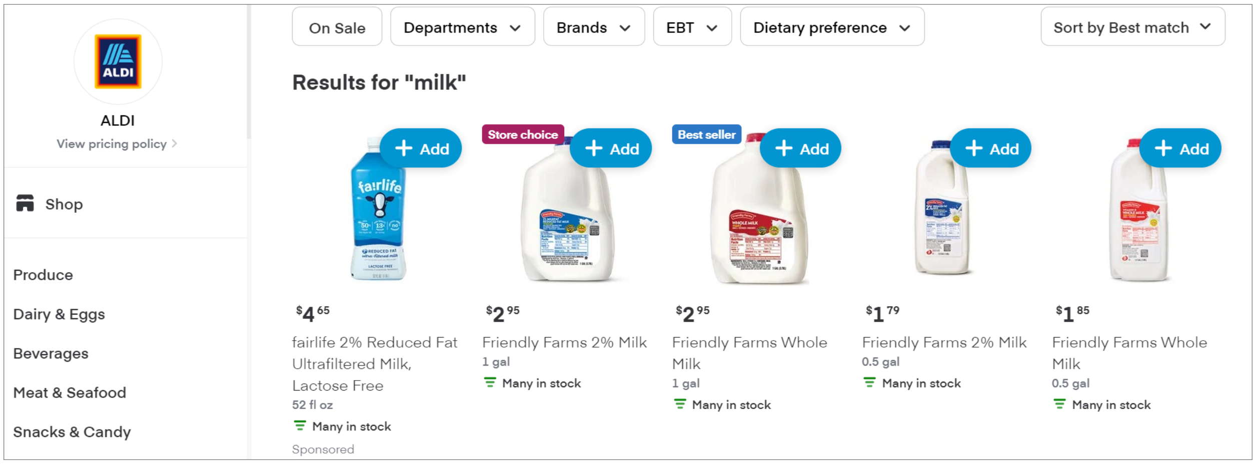
Source: AMS Weekly National Dairy Product Sales Butter; CME Weekly Average Spot Butter

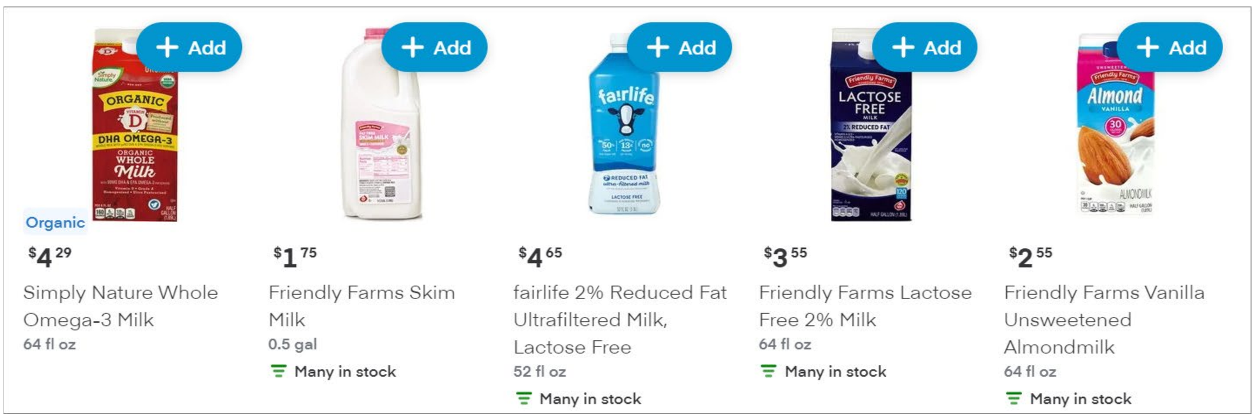
EXHIBIT 6: Comparison of the Nonfat Dry Milk (NDM) Support Price vs. the Advanced two-week NDM price survey

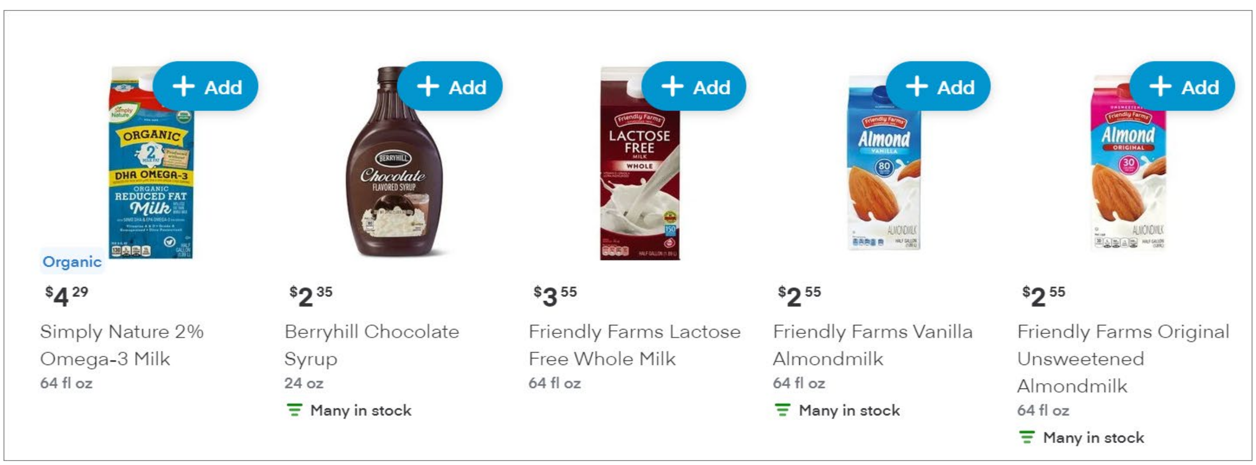


Source: AMS Announcement of Advanced Prices and Pricing Factors;
www.fsa.usda.gove/internet/FSA_File/DPPSP_Fact_Sht_Hist_Data.pdf

EXHIBIT 7: Printscreens of Aldi's website as of July 3, 2023







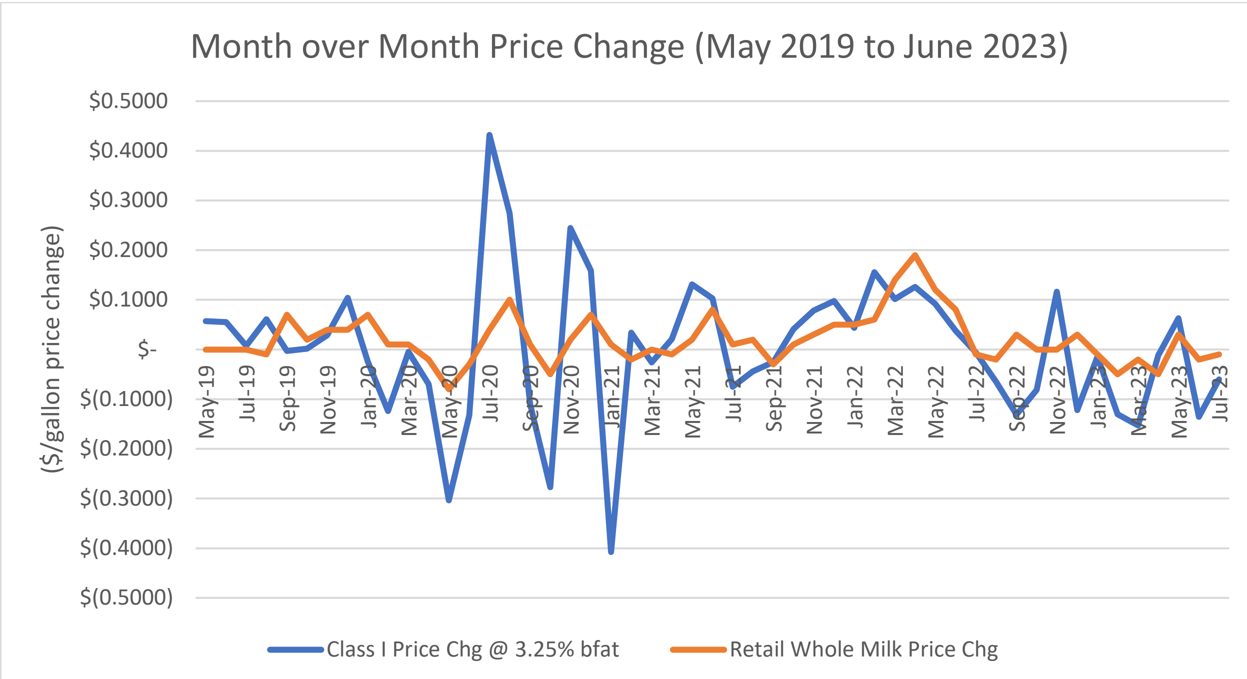
Source: Aldi's Website (Decatur, IL as of July 5, 2023)

EXHIBIT 8: Conversion of Aldi's advertised prices into gallon equivalents

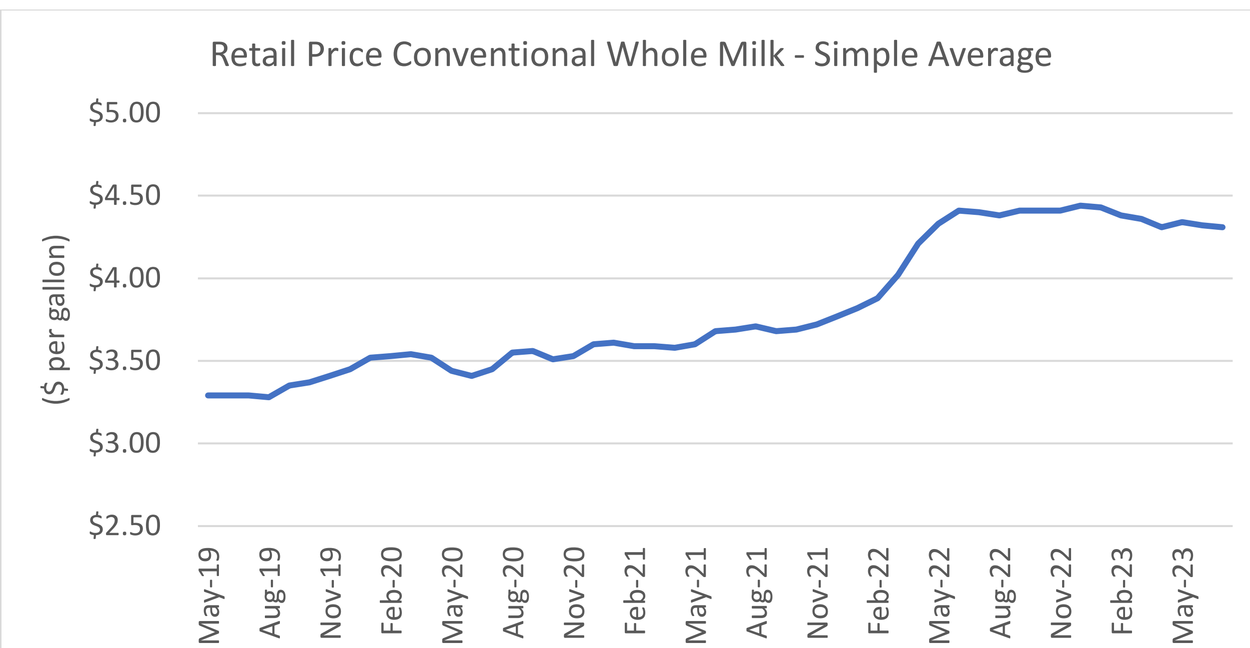
Product	Price/Unit	Gallon Eq.	Price factor to Gallon
Fairlife 2% Reduced Fat	\$4.65 (52 oz)	\$11.45	388%
Simple Nature 2% Omega-3 Organic Milk	\$4.29 (64 oz)	\$8.58	291%
Friendly Farms 2% Lactose-Free Milk	\$3.55 (64 oz)	\$7.10	241%
Friendly Farms Vanilla Unsweetened Almondmilk	\$2.55 (64 oz)	\$5.10	173%
Friendly Farms 2% Milk	\$2.95 (128 oz)	\$2.95	

EXHIBIT 9: Comparison of Retail Price Changes

The chart below compares monthly changes in the Advanced Class I Milk Price adjusted to gallons and at 3.25% butterfat vs. the USDA reported monthly change in surveyed whole milk prices (based on the simple average of surveyed locations) from May 2019 to June 2023



The chart below plots the USDA reported monthly whole milk prices (based on the simple average of surveyed locations) from May 2019 to June 2023



Source: AMS Retail Milk Prices Report (RMP - 1218) 2018 to 2023 (July 26, 2023)

EXHIBIT 10: Table of AMS Container Survey – November 2021

The table compares the reported sales by milk categories – conventional, ESL, and organic to total fluid milk sold by regulated handlers to estimate the amount of organic milk pooled on federal milk marketing orders. This is to estimate the amount of milk that may be excluded by the Wichita Option.

	November 2021		
Product	Conventional	ESL	Organic
Whole Milk	87.90	5.70	6.40
Flavored Whole Milk	88.90	7.50	3.60
Reduced Fat (2%) Milk	87.40	7.20	5.40
Low Fat (1%) Milk	88.50	5.90	5.60
Fat Free (Skim) Milk	83.60	11.40	5.10
Flavored Reduced Fat Milk	89.60	8.60	1.80
Eggnog	68.00	31.20	0.80
Buttermilk	99.00	0.10	0.90

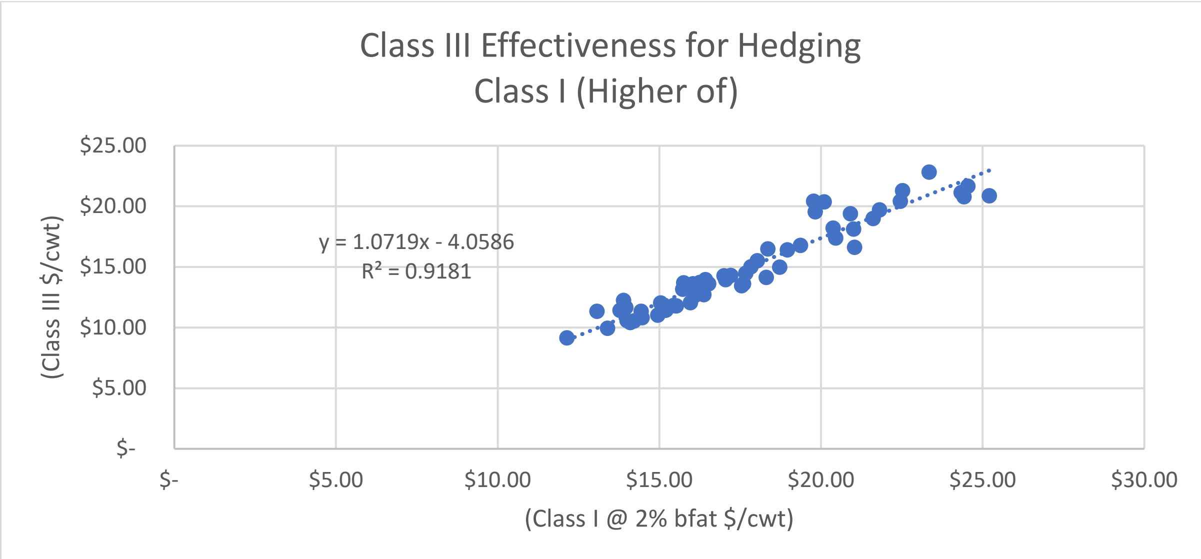
Total Fluid Milk Sold by Regulated Handlers (annual)	87.50	7.20	5.30
Total US milk sales (Nov. 2021)	3.57		0.23
Utilization of Producer Milk (Nov. 2021)	3.19	0.26	0.19

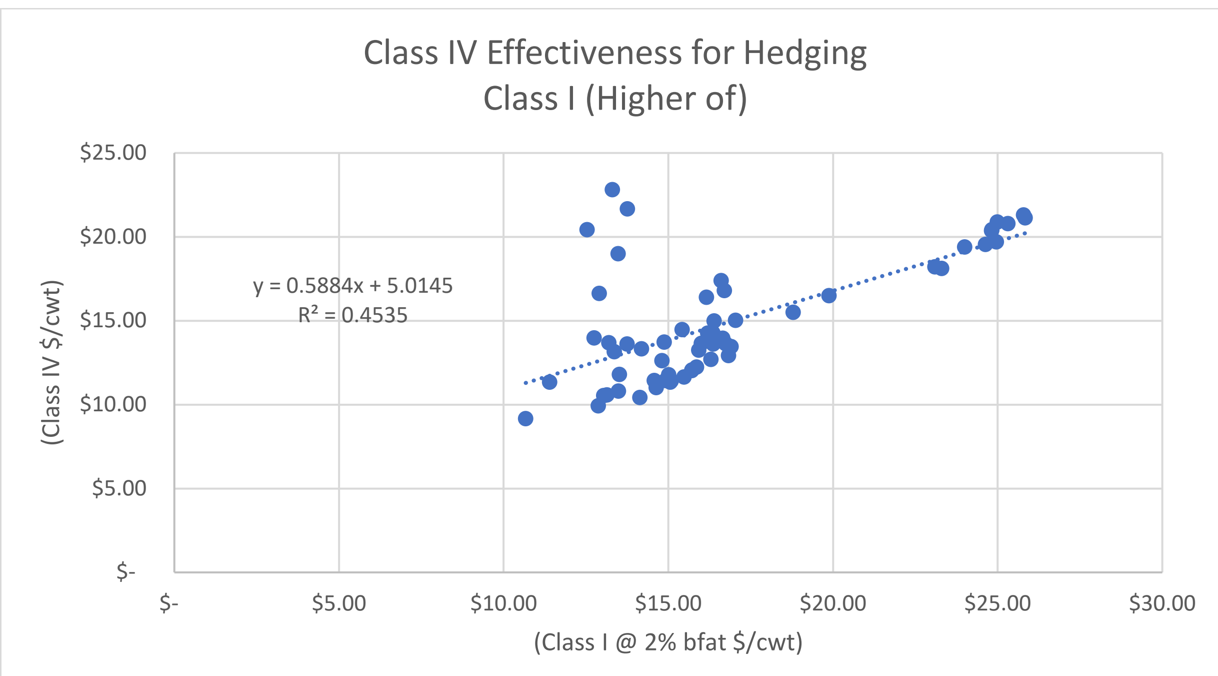
Regulated milk as a percentage of sales	97%		84%

source: AMS Container Survey 2021
AMS 2021 Utilization of Production Milk in Class I Products - Monthly and Year-to-Date
Estimated Fluid Milk Products Sales Report 2021

EXHIBIT 11: Effectiveness (Correlation) of the HIgher-of to the Class III and IV Announced prices.

The chart below correlates the Higher-of Class I skim and butterfat – converted to 2% milk against the previous month's Announced Class III and IV milk to evaluate hedge effectiveness. The previous month's Announced Price is used to simulate "advanced" pricing.

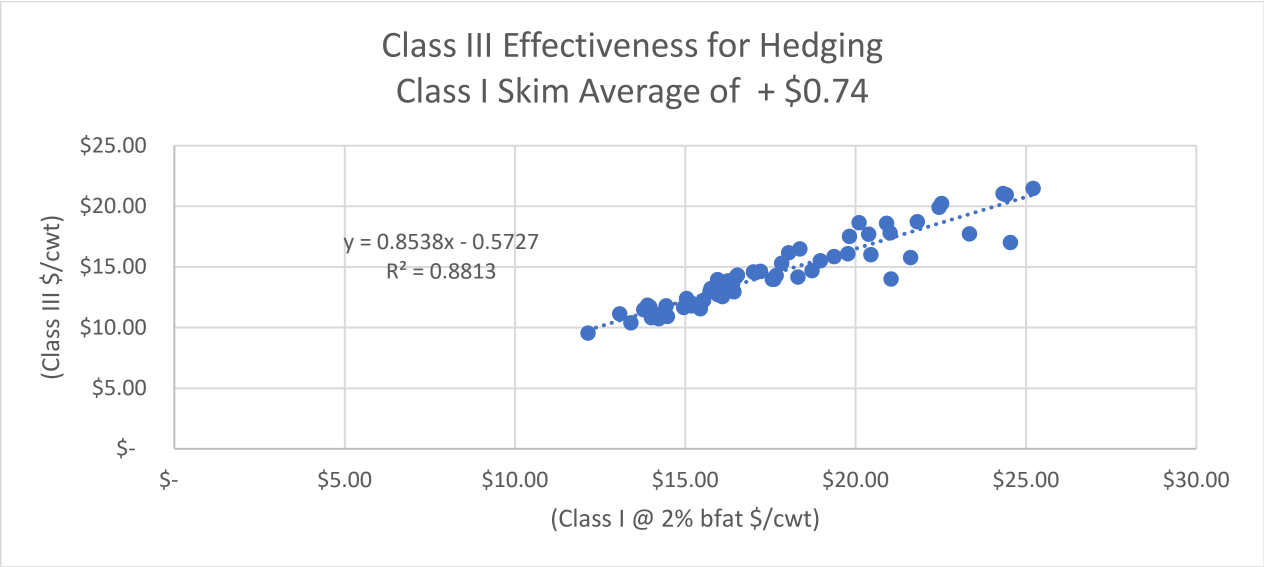


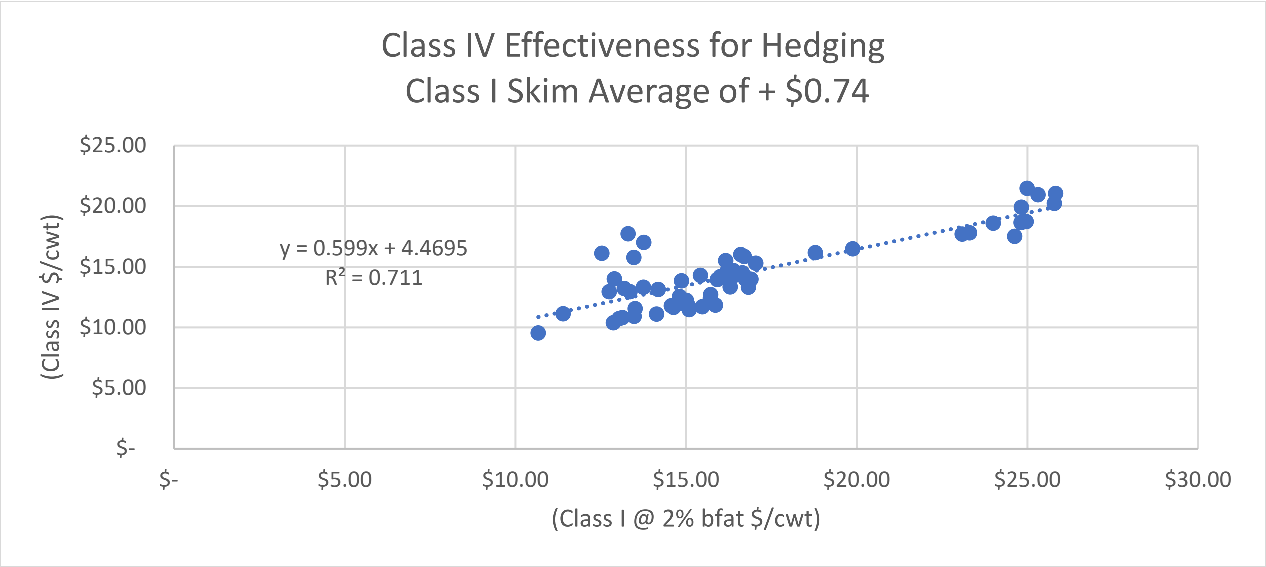


Source: AMS Announcement of Advanced Prices and Pricing Factors

EXHIBIT 12: Effectiveness (Correlation) of the Average-of to the Class III and IV Announced prices.

The chart below correlates the Class I skim and butterfat – converted to 2% milk against the previous month's Announced Class III and IV milk to evaluate hedge effectiveness. The previous month's Announced Price is used to simulate "advanced" pricing.





Source: AMS Announcement of Advanced Prices and Pricing Factors

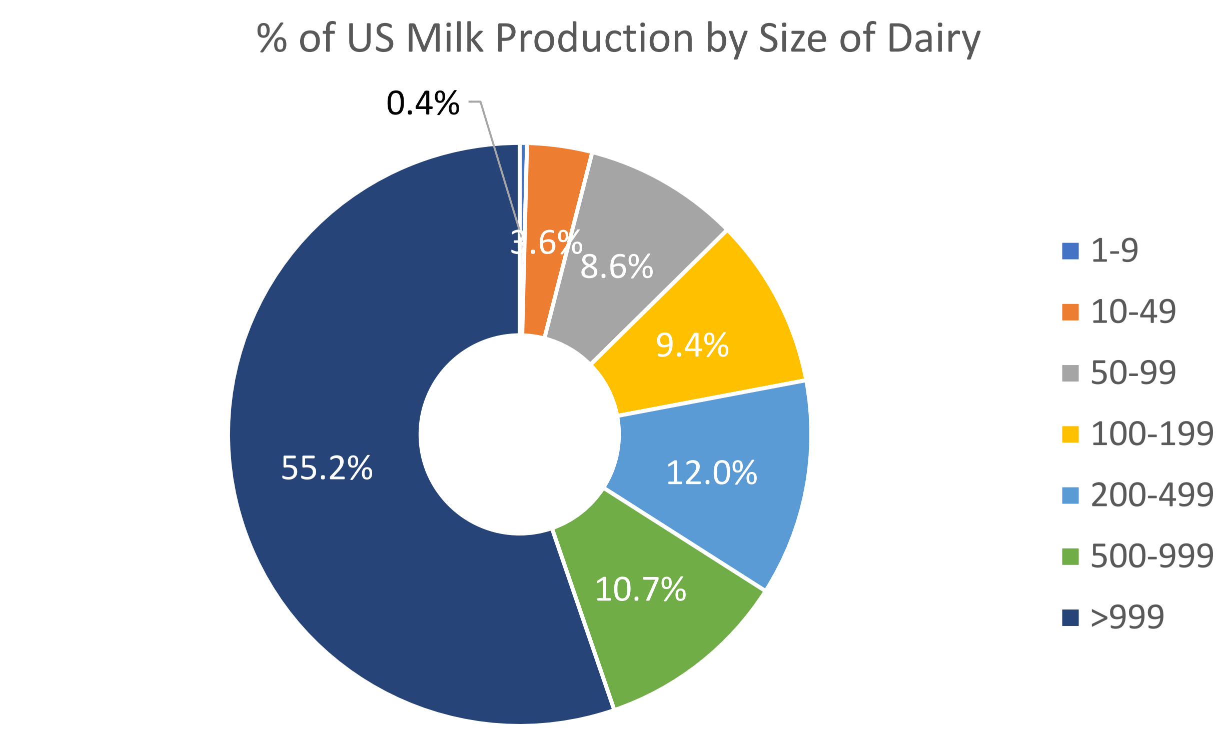
EXHIBIT 13: Dairy Producer Class I Hedge Example

The table calculates the size of farm necessary to hedge Class I milk in FMMO 1, FMMO 6 and FMMO 30

	FMMO 1				FMMO 6				FMMO 30			
	Class I %	Minimum Monthly Milk Production (400,000 /B)	Production per cow NY	# Cows	Class I %	Minimum Monthly Milk Production (400,000 / F)	Production per cow FL	# Cows	Class I %	Minimum Monthly Milk Production (400,000 / J)	Production per cow WI	# Cows
A	B	C	D	E	F	G	H	I	J	K	L	M
Jan-22	31.4%	1,273,480	2,090	609	82.6%	484,496	1,800	269	8.5%	4,694,836	2,095	2,240
Feb-22	31.0%	1,291,156	1,910	675	82.2%	486,855	1,675	290	8.2%	4,901,961	1,915	2,559
Mar-22	29.2%	1,369,863	2,150	637	83.0%	481,754	1,870	257	7.7%	5,188,067	2,140	2,424
Apr-22	29.4%	1,360,082	2,105	646	83.9%	476,701	1,785	267	8.6%	4,667,445	2,075	2,249
May-22	28.7%	1,393,728	2,190	636	78.5%	509,295	1,815	280	9.5%	4,197,272	2,160	1,943
Jun-22	27.5%	1,452,960	2,105	690	81.2%	492,914	1,690	291	6.6%	6,079,027	2,100	2,894
Jul-22	26.9%	1,484,781	2,145	692	81.3%	491,944	1,605	306	6.0%	6,700,168	2,150	3,116
Aug-22	28.7%	1,392,758	2,130	653	83.6%	478,641	1,545	309	5.8%	6,932,409	2,145	3,231
Sep-22	30.9%	1,296,176	2,055	630	84.7%	472,199	1,430	330	6.1%	6,546,645	2,060	3,177
Oct-22	30.2%	1,325,381	2,105	629	85.0%	470,422	1,550	303	5.9%	6,802,721	2,100	3,239
Nov-22	31.1%	1,286,587	2,035	632	84.3%	474,440	1,575	301	5.7%	7,005,254	2,030	3,450
Dec-22	30.8%	1,300,390	2,100	619	85.5%	467,617	1,720	271	5.6%	7,104,796	2,095	3,391

EXHIBIT 14: Percentage of US milk production by size of farm (2017).

The chart below denotes size of farm (by number of cows) and the contribution to annual milk production in 2017.

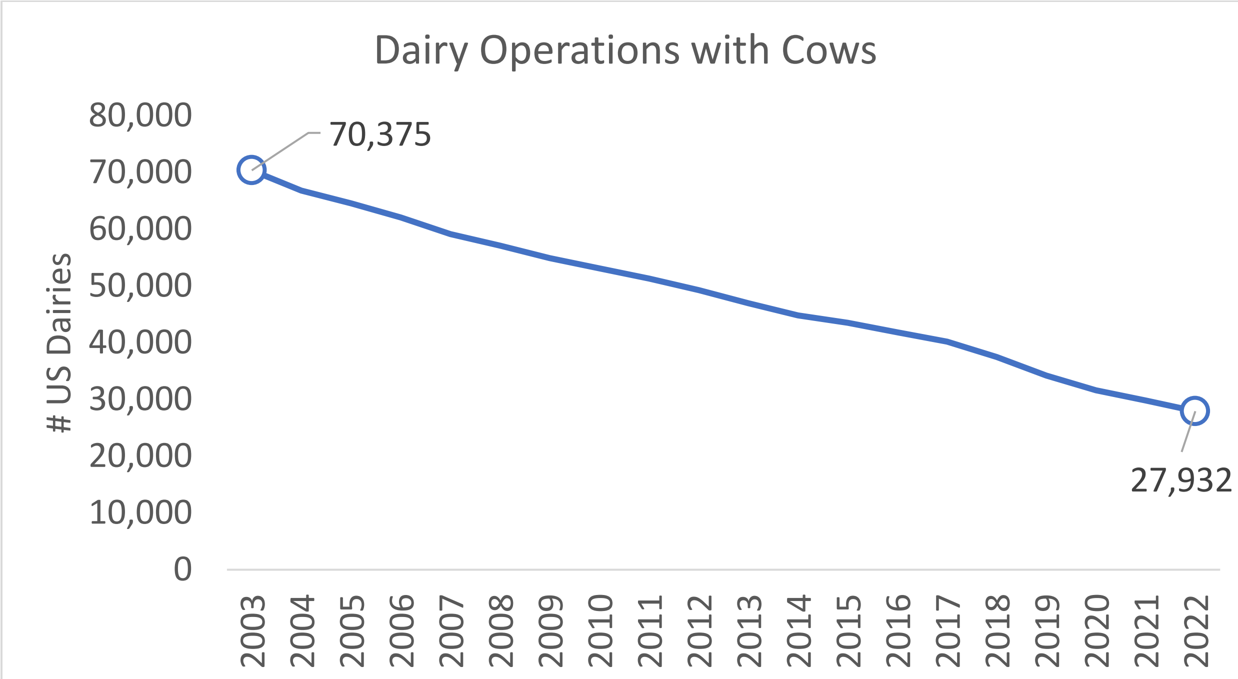


Source: USDA-ERA, "Consolidation in United States Dairy Farming" July 2020

EXHIBIT 15: Comparison of Proposals 13, 14, 15, and 16 relative to the current Class I skim price.

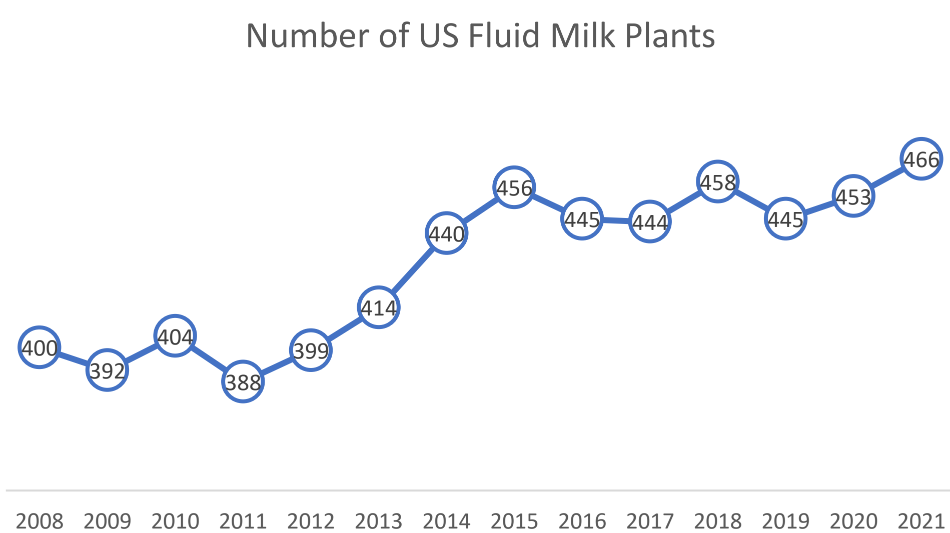
<u>See Excel sheet.</u>

EXHIBIT 16 US Dairy Operations per Year.



Source: NASS, Milk Production (2003-2022)

EXHIBIT 17 ERS Number of fluid milk production plants since 2008 (United States)



Source: ERS US Fluid Milk Plants Report