Montana Milk Market Regulation Study
Final Report

To assist the
Montana Board of Milk Control
with Future Policy Development

June 4, 2018

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1. EXECUTIVE SUMMARY

1.a. Purpose of Study

The stated purpose of the study is to provide information and insight to support future policy development by the Montana Board of Milk Control. To accomplish this, we evaluated the dairy industry in Montana, and incorporated regional and national aspects to develop options and recommendations intended to:

- Improve the viability and sustainability of the dairy industry in Montana
- Ensure that revenues and costs are fairly and equitably treated among participants
- Position the Montana Dairy Industry to compete effectively in the region and create and realize opportunities for growth and investment

Throughout this report most of our empirical analyses and calculations use calendar year data provided by the Montana Department of Livestock Milk Control Bureau rather than fiscal year figures. This allowed us to evaluate more recent data based on the calendar year ended December 31, 2017 as opposed to the last fiscal year ended June 30, 2017. On occasion, where it was necessary or appropriate, we used fiscal year data and identified it as such.

1.b. Summary of Key Findings and Recommendations

Overall, the recommendations which follow are intended to strengthen the Dairy Producers in Montana, so they are in a position to adapt to future growth and Processor needs. We believe this can be accomplished by modifications to the existing Quota and Pooling structures. These changes are intended to create a pricing structure that provides a return to the Producers and improves their financial position, while at the same time provides Processors with the volume of milk needed and allows them to earn a reasonable return on their facility investments.

The following summarizes our Recommendations, some of which were selected from multiple options. Where there are multiple options, the Analysis and Findings section of this report contains detailed discussions of the options considered.

<u>Study Task 1 – Price Formula Analysis & Recommendations</u>

1) Use the Federal Milk Marketing Order Advanced Class pricing as the basis for Montana in-State milk (see detailed discussion in Section 4.a. ii. Montana Class I Pricing on page 27)
   a) Dairy processing plants in most states and Orders in the country, including the states near Montana, use Federal Order pricing as their basis, even if the state is not regulated
2) Montana should maintain the Montana Differential of $2.55 for Class I milk for the immediate future
   a) We found no compelling reason to revise it at this time, and it supports the Producers
   b) Should the fluid milk market in Montana change or become threatened by out-of-State Processors, it may make sense to revise the Montana Differential

   c) It may make sense to lower the Montana Differential, once our recommended changes are fully implemented and Producers are in a better and more stable financial position, to strengthen Montana's competitiveness
      i) If such a move is considered, the impact on remotely located Producers should be evaluated as part of the analysis
3) Class II should be based on the Federal Order, with Class II butterfat based on Advanced pricing (see detailed discussion in Section 4.a. iii. Montana Class II on page 29)
4) Montana Class III pricing should be the lower of Federal Order Class III and Class IV but calculated from Advanced pricing (see detailed discussion in Section 4.a. iv. Montana Class III on page 30)
   a) This should increase value to Producers
   b) It may be necessary to incorporate some discounts to Processors, at least for a period of time, to allow the impact of a change in Class III pricing to be absorbed
      i) We recommend a $0.25 per pound (approximately 10%) reduction to the butterfat price that reduces to around $0.10 (approximately 4%) over three years
   c) Setting the Class III skim price at the lower of the Federal order Class III or Class IV skim price supports the potential for Class III milk manufacturing in Montana. The butterfat discount provides additional incentive
5) The pricing structure for raw milk that is sold out-of-State as Surplus Bulk milk can remain substantially the same
   a) At present, Surplus Bulk is sold to balancing plants, and through the Pool, Montana Producers are effectively paid whatever the receiving plant is willing to pay for the milk, less the cost of hauling
6) Do not institute seasonality incentives (see detailed discussion in Section 4.a. vi. Variable Class I Price Formula to Manage for Seasonality on page 33)
   a) Given Montana's size, and the lack of successful models for managing seasonality, we do not believe seasonality incentives are appropriate
7) Component Pricing would have no immediate benefit and is not necessary at this time since Montana Pool Processors currently do not make Class III products (see detailed discussion in Section 4.a. vii. Component Pricing on page 37)
   a) However, given that Component Pricing provides benefits to Class III Processors, Montana could establish Component Pricing to support investment interest, and to have it in place in the event that a Class III plant is looking to locate in Montana

<u>Study Task 2 – Recommendations for Adjustments to Utilization of Class I Packaged Milk Sold as Surplus Milk</u>

8) The discount for Packaged Milk sold out-of-State should continue with some modifications (see detailed discussion in Section 4.b. i. Surplus Packaged Milk on page 37)
   a) The concept of discounting Packaged Milk that is sold out-of-State works well, but the level of discount should depend on where the milk is being sold and be justified by the Processor by calculating the difference in the local market Class I price as well as the cost of delivery to that specific market

b) These calculations should be verified by the Milk Control Bureau
c) The discount will be different for different geographic markets

Study Task 3 – Hauling Unprocessed Milk Between Plants

9) The practice of charging the state-wide Pool for the cost of hauling unprocessed milk between plants should be discontinued either on a stand-alone basis or in conjunction with other Pool related recommendations (see detailed discussion in Section 4.c. Study Task 3 – Hauling Unprocessed Milk Between Plants on page 41)
   a) Charging Producers for the cost of hauling milk that is "diverted" between Class I plants does not exist in any other Order in the country to our knowledge
   b) This practice enables certain inefficiencies in the system and results in certain Producers subsidizing costs for which they do not always receive equal value in return
      i) Our experience is that hauling charges for transporting milk between Processors is typically borne by the Processor, but the Producer pays for the portion of the hauling cost that represents the cost of delivery to the closest plant if the milk had not been diverted
   c) In Study Task 4 we recommend splitting the current state-wide Pool and establishing two separate Pools by Processor (see Recommendation 14) on page 8)
      i) Under separate Processor Pools, the Producers in each Pool could decide whether and how to allocate this cost within their Pooled group

Study Task 4 – The Montana Quota System

10) We believe the Montana Quota system should be modified so that the state-wide volume of issued Quota ("Quota") is approximately equal to the Montana Class I volume that is packaged and sold in Montana (see detailed discussion in Section 4.d. iii. Options for Setting the Amount of Quota Going Forward on page 53). We considered three options:
   a) **Quota Option 1:** Our recommendation is that total state-wide Quota be set at approximately 107% of Class I Montana volume
      i) This is the approximate volume of milk necessary to adequately supply in-State Class I sales, given that a portion of the raw milk required for Class I ends up as cream and shrink as part of the normal bottling process
      ii) If total Quota is set at 107% of Class I volume and Producers stay strictly within their individual Quota, a situation could arise where there may not be enough milk to meet Class I needs. We believe this is unlikely and could be addressed at the appropriate time
   b) **Quota Option 2:** A second option would be to maintain Quota at its current level, but increase the Differential significantly above the current $1.50 to provide a strong, even uneconomic, disincentive for producing Excess
      i) Because state-wide issued Quota is greater than current production, this may have little effect in reducing over-production and Surplus milk. Although Producers may reduce or eliminate their Excess, other Producers, who currently produce under

their Quota, could easily make up the difference without going over state-wide Quota

c) **Quota Option 3:** A third option would be to eliminate Quota entirely
   i) We do not believe this option would be appropriate because of its impact on the asset value of assigned Quota to farms

11) Other rules that we believe would support a revised Quota system include:
   a) Adjust Quota up or down as appropriate on an annual basis to stay in line with Class I in-State volume
   b) Allocate any revisions or adjustments in Quota on a pro-rata basis among Producers currently holding Quota
   c) Reduce the Quota of any Producer, whose average monthly production did not meet their full monthly Quota volume during the same annual period, to what they actually produced over that period, in concert with the annual Quota adjustment
      i) The difference would be dropped from the system
      ii) At the next annual Quota adjustment, the proper volume of Quota would be established and reallocated on a pro-rata basis
   d) Relinquish and drop from the system any Quota held by a Producer who has shut down operations and has been unable to sell the Quota within a year
      i) Currently the rule provides 90 days to sell, but unsold Quota is reallocated to all remaining Producers on a pro-rata basis
      ii) Since lost Quota would be dropped from the system, it seems reasonable to provide potential buyers more time to decide or arrange any financing necessary to purchase additional Quota

12) We evaluated three methods for pricing Quota Volume (See discussion in Section 4.d. v. Options for Pricing Quota Milk on page 59)
   a) **Quota Pricing Option 1:** Our recommendation would be to price Quota milk based on the calculated value of the highest value utilizations of the volume required to make up Quota
      i) If Quota is equal to or less then Class I sales, the Quota milk price will be the Class I price
      ii) If Quota is greater than Class I sales, then some of the utilization value of the next highest value product will be included in the Quota milk price calculation.
      iii) This structure is similar to the Cascading Tier structure, but just for Quota
   b) **Quota Pricing Option 2:** A second option is to price all Quota milk at Class I regardless of the actual Class I volume
      i) This maximizes revenue for holders of Quota and if Class I volume is less than Quota, the Class I utilization value of the difference would be drawn from Excess utilization value of the Pool
   c) **Quota Pricing Option 3:** A third option is to incorporate Class I pricing with an appropriate percentage of Class III pricing to derive a net weighted average price for Quota milk
      i) Since bottling Class I milk generates cream and shrink, the percentage of raw milk that is generated as cream and shrink as part of the bottling process should be

valued at its Class III price and combined with the Class I value of the bottled milk to derive a net weighted average price for Quota milk

d) Under any of these options the current fixed Excess Differential of $1.50 would become unnecessary and somewhat counterproductive to a certain extent
   i) If the Excess Differential is maintained it should be increased to an appropriate level to reflect the impact of Pricing and other Pooling recommendations (see discussion in section 4.d.vi. Pricing Excess Volume on page 60)
e) The estimated incremental cost of production in Montana would allow many Producers to produce a reasonable amount of Excess on a profitable basis, so long as Excess was not valued too much below Class III

13) Once the method for pricing Quota Volume is determined, there are a number of methods for pricing the Excess Volume. We believe the most equitable approach for pricing both Quota and Excess is to establish a "Cascade" pricing methodology so that each Producer participates in lower value utilizations (below Class I) only to the extent that they have remaining unutilized Excess (see detailed discussion in Section 4.d.vii. Cascading Tiered Pricing on page 60)
   a) Each lower value "tier" of utilization would be allocated only to those Producers who generated sufficient Excess to participate in that tier
   b) At each tier the allocation of value would be based on the proportion of Quota owned by the Producers whose un-utilized Excess falls into that tier and the Producers with the highest percentage of production in excess of Quota production would fall to the lowest tier. In determining the pro-rata allocation within a given tier, Quota ownership of just those Producers falling to that tier would be the basis of allocation.
      i) For example, if total Quota across the Pool is 160 million pounds, then the allocated share of the first tier would be based on each Producer's pro-rata share of the total Quota of 160 million pounds
      ii) However, if the total Quota ownership associated with just those Producers whose Excess production fell into the third tier amounted to a total of 40 million pounds of Quota, then the allocated share of that tier would be based on those Producers pro-rata share of the 40 million pounds of total Quota, regardless of the actual volume in that tier
   c) The tier with the lowest value of utilization (e.g., Bulk Surplus) would end up allocated to those Producers with the highest percentage of Excess production
   d) This approach increases return to those Producers who have more Quota and minimize their Excess and lowers return to Producers with less Quota and higher Excess and works regardless of how the Pool is structured
      i) The resulting Excess milk price paid to the Producers would depend on which Pool they deliver to assuming the Pool is no longer state-wide

14) As part of our evaluation of Study Tasks 1-4 we evaluated whether the Pool structure itself needs to change to help address the broader range of issues and in conjunction with other recommendations made in this report. Our conclusion is that the Pool should change (see detailed discussion in Section 4.d. viii. The Pool Structure on page 66)

a) Pool Option 1: Our recommendation is that the state-wide Montana Pool, as well as Quota, should be separated into two Pools aligned with the current Pool Processors Darigold and Dean/Meadow Gold. Separate Pools, in addition to addressing the inter-Plant hauling issue, would eliminate other offsetting values or costs incurred by each group of Producers that are currently allocated across the state-wide Pool. These include Bulk Sales hauling charges, out-of-State Packaged Sales discounts, and Bulk Sales price reductions
   i) Pool Option 1-A: Associating Quota by Processor through the Producers who supply that Processor, along with the segmented Pools, would create some initial alignment issues, where each Pool would have more or less Quota than its Class I sales, but we believe these could either be resolved during the initial implementation or allowed to evolve and be re-evaluated over time as appropriate
   ii) Pool Option 1-B: A second approach for addressing Quota under a segmented Pool structure would be to maintain Quota on a state-wide basis, but handle Excess within the segmented Pools
      (1) When Quota volume exceeds Class I sales, the additional utilization value assigned to Quota could come from either Pool, whichever has the highest value utilization
   iii) Pool Option 1-C: The third approach under a segmented Pool structure would be to eliminate Quota altogether
      (1) We do not believe this option would be appropriate because of its impact on the asset value of assigned Quota to farms
b) Pool Option 2: The second option in regard to the Pool would be to eliminate it completely
   i) A significant issue that would need to be addressed, if the Pool is eliminated but the Quota system is kept, would be how handle unaffiliated Producers (not members of a cooperative) who hold Quota
   ii) However, the Milk Control Bureau's interpretation of 81-23-302(15), MCA is that the statewide Quota systems is an optional add-on of the statewide Pool. If the statewide Pool system is eliminated, the statewide Quota system would be eliminated by default. Producers delivering to a common distributor could petition for a Quota plan under that distributor under 81-23-302(14), MCA.
c) Pool Option 3: The third option would be to maintain the state-wide Pool essentially as it is but make minor adjustments to address individual issues

<u>Study Task 5 - Expansion</u>

15) In addition to addressing the specific individual Tasks of this report, the recommendations provided above should help to stabilize and strengthen the core foundation and financial viability of the dairy industry in Montana. This in turn should help create an environment to attract investment and growth in the industry by:
   a) Incentivizing ongoing efficiency improvement throughout the dairy value chain
   b) Aligning pricing with market conditions

c) Enabling greater opportunities and flexibility for milk from Montana
d) Making Montana more attractive as a state for dairy investment
e) Providing a structure that enables production of a sufficient supply of milk at a price that is attractive

16) Beyond that, the state could consider measures that would address the factors and priorities investors in dairy related projects evaluate when comparing locations and making investment decisions:
    a) Sufficient supply and pricing of milk
        i) Cost of dairy farm inputs
        ii) Milk production regulations and permitting
    b) Capital and operating cost of Processing
        i) Availability and cost of land and infrastructure
        ii) Ease and cost of permitting and regulatory compliance
        iii) Cost of construction
        iv) Cost of manufacturing inputs – power, labor, materials, disposal
    c) Programs and incentives designed to create and promote an entrepreneurial environment for dairy processing and specifically targeted at attracting smaller, niche and branded production of dairy products
17) Certain products may be more attractive than others
    a) Montana's milk supply is either too small or too large depending on the type of product desired
        i) Producing commodity cheese requires a plant with a very low production cost. This requires large volumes of milk (minimum of 1 million to 2 million pounds per day). Montana is not currently in a position to do this
        ii) Alternatively, smaller facilities produce smaller quantities of product at a higher cost, but this requires a branding strategy to be profitable. Typical plants of this size might start out between 3,000 and 30,000 pounds of milk per day. This will not have a very large effect on the Surplus Milk situation in the State
    b) Yogurt has been a trending product. If a local yogurt plant could supply 20% of the current Montana consumer usage, that would be 3.5 million pounds per year which would make for a viable plant and would use a good amount of Montana Surplus milk. A modest plant could be built on its own or added to an existing milk plant. However, there is a lot of competition, and it would be difficult to take share from established companies
    c) Cheese may be the easiest product to develop. For under $1 million, a modest plant could be built to supply specialty cheese to the local market
    d) Other potential products include butter, ghee (a butter product) and carbonated and other new milk products

2. STUDY APPROACH AND CONSIDERATIONS

The purpose of this study was to provide information and insight to support future policy development by the Montana Board of Milk Control. Our approach involved gaining an understanding of the Montana Dairy industry and then analyzing the regulations with an eye towards strengthening the industry and providing a framework for growth.

Broadly, our approach was to address the general structure of regulations, rules and procedures governing the Dairy Industry by the Montana Legislature and the Milk Control Bureau and the overall philosophy and structure of regulation. In doing so, there appeared to be two broad sets of options:

- Generally continue under the current structure and rules and tweak certain elements
- Change the fundamental structure; possibly towards a model that incorporates partial or total deregulation

In general, we looked to move Montana towards a model that provides more flexibility and decision making, especially at the Producer level, that would allow the broader industry to respond to changes in the market and region. This would allow more flexibility in making changes that reflect market conditions and help speed up the process of change when change is warranted.

In addressing the pricing structure (Study Tasks 1 and 2) of Montana's various Classes of utilization we considered a number of questions:

- What should Class pricing formulas be based on?
- Would component pricing be useful?
- Would it be beneficial to implement policies to manage seasonality of milk?
- Should the Montana Differential be adjusted and what are the implications to competition from out-of-State as well as the impact on Producers and Processors?
- How should the disposition of Cream, Surplus and packaged milk currently going out-of-State be handled and what is the impact on Producers and Processors?

In our evaluation of the structure of the Dairy Pool (incorporating the Quota system and Inter-Plant Hauling, Study Tasks 3 and 4) a number of options were considered that included:

- Continue but tweak the current shared Pool approach state-wide
- Eliminate the Pool entirely and directly assign revenues and costs to individual entities
- Segment the state-wide Pool into certain sub-groups (either Producer or Processor based), then share as agreed within each sub-group
- Change how transport costs for inter-Plant (Task 3) and out-of-State hauling are handled
    - Should inter-Plant hauling cost be charged to Pool or other?
    - Should out-of-State bulk transport cost be charged to Pool or other?

In considering whether revisions should be made in how other components within the state-wide Pool are handled we addressed the following broad questions:

- Should out-of-State packaged milk differentials be shared in the Pool or otherwise?
- Should bulk milk sales utilization value be shared in the Pool?
- If the Pool is restructured into sub-Pools, and milk is shipped between the sub-Pools, how should these inter-Plant milk deliveries be priced or valued?
- Should there be a cap on any of the amounts that are charged to the Pool?

In our evaluation of options for setting and allocating Quota (Study Task 4) we addressed the following questions and issues:

- Should the Quota system be eliminated altogether?
- Should the Quota system be changed to create a different volume basis for Quota?
    - What classes of utilization in Montana should be included in Quota?
    - How often should Quota be adjusted?
    - Should mechanisms be established to revise Quota volume down as well as up?
- How should Quota be priced?
- Should the Excess pricing Differential be changed?
- What should Producer requirements be for meeting Quota?

Finally, in evaluating the feasibility of expanding dairy processing and manufacturing within Montana (Study Task 5) to support and generate growth in Montana milk production we addressed such questions as:

- Is there a defined market for dairy products that would support a basis for new investment?
- What state incentives and policies outside of what the Milk Control Bureau controls could be made available including:
    - Incentives to promote feed crop farming, dairy farming, processing plants and consumption
    - Financial and tax incentives, establishing economic development zones
    - Environmental incentives or policies
    - Land and use permits, access to utilities and other requirements
    - Creating an environment to attract commercial investment in dairy

3. GENERAL OBSERVATIONS AND FINDINGS

3.a. Summary Overview of the Montana Dairy Industry

The dairy industry in Montana reflects trends that are occurring nationally. Overall, the consumption of fluid milk has been consistently trending downwards, although recently there has been increased interest in higher fat content in fluid milk. There is an oversupply of milk that, in concert with declining consumption, has the natural effect of pushing prices down and creating a certain level of volatility, although it should be noted that many factors contribute to the movements of pricing.

Many dairies are ceasing operations but the average herd size of those that remain has increased to generally take up the slack. The economics of dairy farming favors farms with sufficient size to realize economies of scale. Per a USDA report titled "Changing Structure, Financial Risks, and Government Policy for the U.S. Dairy Industry", released in March 2016, farms with herds larger than 2,000 cows realize cost efficiencies of up to 25% per cwt compared to the dairies with 500 or fewer cows that represent the bulk of Montana's farms. These trends of lower demand for fluid milk and consolidation of farms and Processors are expected to continue.

Montana operates in a somewhat unique environment. Within the United States, Montana ranks 4th in terms of land area, 44th in terms of population and 48th in terms of population density. Data regarding Montana's per capita consumption of dairy products was not readily available for this report but given Montana's population ranking it is assumed that it's dairy consumption rank would be comparable.

Montana ranks at or near the bottom regionally, as well as nationally, in terms of milk production and the net price its dairy farmers receive for their milk despite having the highest price in its region for Class I milk. Montana provides nearly 85% of the fluid milk sold within the state but less than 10% of all other dairy products sold. This low net price results primarily from the fact that nearly 40% of Montana milk production is sold out-of-State at greatly discounted prices that, along with other factors and adjustments including high transport costs, lower the average price of milk that Producers receive.

Montana operates under a state-wide Pool system for pricing whereby all dairy Producers receive the same blended price for the milk they produce, adjusted for butterfat and whether the milk is part of their Quota volume or Excess (as described below). The blended price is based on the utilization of all the milk received by Montana's three in-State Pool Processors located in Great Falls, Bozeman and Billings, and includes certain freight and other pricing-related adjustments that are made based on how and where the milk is sold. This Pool-based blended price per cwt received by all Producers in the state is, in concept, the same regardless of how much milk an individual farmer produces, although there is a fixed difference of $1.50 per cwt between Quota volume and Excess volume.

Each Montana-based farm has a specific defined daily volume of milk they may produce, their Quota, to obtain the best price. Any milk produced in excess of their Quota volume is penalized with an Excess Differential of $1.50 per cwt as described in the following.

Milk produced by a farm within its individual Quota is paid for based on the Producer's actual skim and butterfat content, with each component paid based on a Quota skim price and a Quota butterfat price. This results in a Quota blend milk price for the individual farm that differs based on each farm's butterfat content. Conceptually, if all farms had the exact same butterfat content, the result would be a common state-wide blend Quota price.

Milk produced in Excess of a farm's individual Quota is priced at the individual Producer's Quota blend price less a fixed $1.50/cwt reduction. This Differential was established to discourage Excess production. As with Quota, the Excess blend price is paid based on actual skim and butterfat content, but again, if all farms had the exact same butterfat content, the result would be a common state-wide Excess blend price that would be $1.50/cwt less than Quota under the same assumption. Although Quota is defined as a daily production allotment, Quota and Excess production are calculated on a monthly basis for purposes of pricing.

The total volume of Montana production allowed by the Quota system was established years ago based on the then volume of milk that was being processed in-State for the Montana market. Since then, the Quota volume has remained relatively the same, but milk processed and sold within the State has declined to the point where now almost 40% of the volume produced within Quota represents Surplus milk over what can be processed and sold within the State.

In fiscal 2017 total state-wide Quota volume among all Producers was greater than total production by nearly 6.5% despite the fact that a number of dairy farms produced well in Excess of their individual Quota volumes, meaning that the other farms collectively produced less than their individual Quota volumes. The volume of milk produced by those farmers who exceeded their individual Quota represented 3.94% of total production in calendar year 2017, down from 4.87% in 2016 and 6.14% in 2015, reflective of a general reduction in the total state herd size over that period.

Regardless of their individual Quota, farmers are free to produce at whatever volume they choose so long as their Processor will accept it. The Processor will either utilize the milk itself or divert it to another plant. Alternatively, farmers can find a home for the Excess milk on their own.

The combination of Pooling and Quota systems has contributed to a situation in Montana whereby farmers have sustained a level of production that far exceeds what is needed for in-State utilization. This over-production has resulted in downward pressure on prices. Within the current structure farmers have little to no effective incentive or means to manage the amount

of milk they produce in order to affect the price they receive. Since they will receive the same price per cwt, based on their butterfat content, regardless of how much milk they individually produce, many farmers continue to produce as much as allowed by their individual Quota volumes, and in some cases much more.

Technically, if all Producers reduced or increased production enough there would be an impact on the net blended price, but the impact of a volume change by any individual Producer has negligible effect. It would take an unlikely concerted effort to have all Producers reduce volume by an equal percentage on a state-wide coordinated basis.

The impact to Processors is somewhat more favorable in that sales out-of-State allow them to maintain a higher volume going through their plants. This helps their efficiency somewhat and provides additional sales, but the cost impact of this tends to be borne by the farmers. Without available Surplus milk, certain plants may potentially be hard pressed to maintain profitable operations. This could potentially lead to shutting down operations.

The current combination of Pooling and Quota systems also has the effect of masking certain logistical and operational inefficiencies within the state's dairy value chain that makes Montana's milk and related products less competitive in the region. It should be noted that Montana's rules for Pooling, Quota and pricing have been in place for a long period of time, in some cases for decades, and pre-dates the tenures of the current Board of Milk Control and staff.

The majority of Montana's Producers are relatively small, and many are located significant distances from the nearest Processor. Nearly half operate as independent Producers. This geographic dispersion of Producers results in a higher cost in the raw milk supply to cover transportation costs. Additional transportation cost is incurred transferring milk primarily from Great Falls and Bozeman Producers to the Billings plant to meet its demand.

Producers have been shutting down steadily over the last 20 years. The current number of dairies represents about half of the dairies that were in operation in the year 2000, although an increase in average herd size, and increased production per cow, have taken up a fair portion of the slack. These same trends exist in other parts of the country. However, all of the states in Montana's region other than North Dakota and Wyoming, the States closest in size to Montana, have more than offset a reduction in the number of herds by an increase in total cows and production per cow. This has resulted in net growth in their dairy industry, which for certain states has been significant over the period 2006-2016 (see Comparison of State Dairy Industries in Section 4.a. i. on page 24).

The three primary processing plants are relatively old, somewhat small and currently run below their capacity, which lowers their general efficiency. In addition, they are owned by large national and regional concerns that have multiple plants in neighboring states, many of which could serve Montana.

Several neighboring states and the region collectively dwarf Montana in all respects; production, processing, and assumed efficiency and lower cost. There are bottling plants in neighboring states that are sufficiently close enough, within several hundred miles, to conceivably supply Montana with finished product.

In summary, the Montana dairy industry is in a somewhat fragile and vulnerable position:

- Montana is one of the smallest dairy consuming states in the nation and its Class I fluid milk consumption has declined in line with the national trend
- Overall the Montana dairy industry is small, geographically dispersed for its size, and almost entirely concentrated on commodity Class I fluid products. Montana already serves 85% of the Class I in-State market. Nearly all other dairy products are brought in from out-of-State
- With the exception of Idaho in 2017, the net price for milk per cwt paid to the Producers in Montana is the lowest in the region and at or near the bottom in the country
- The Pool in Montana was initially established to benefit Montana's Producers as a group, but it currently has the effect of subsidizing costs incurred by certain portions of the system across the entire system. Revenues and costs do not flow directly to where earned or incurred

3.b. Detailed Information on the Montana Dairy Industry

The Montana Dairy Industry has been steadily declining over the period of fiscal 2000 through 2017 and is challenged by a number of factors. The number of Montana Dairy Producers declined by 60% but this was offset somewhat by a doubling of the average herd size from 92 to 184 (See "Montana – Number of Cows and Dairies-Trend" in Appendix C). The total number of cows declined by 15% but was offset somewhat by an increase in production per cow of 12%.

Montana total milk production varied over the period, but calendar 2017 production was the lowest over the period and nearly 5% less than in the year 2000. Montana supplies 85% of the 22 million gallons, or 190 million pounds, of Class I milk consumed in Montana. Approximately 60% of the milk produced in-State was utilized for in-State consumption and nearly 95% of Montana milk utilized in-State was used as Class I. 80% of the remaining 5% was for Ice Cream which represented approximately 40% of Montana's Ice Cream consumption. The remaining 40% of Montana milk production leaves the State as packaged and Bulk Surplus Milk and this has a significant negative effect on the net blended price paid to Producers.

Total processing capacity within Montana has declined as plants have been shut down over the last 20 years but still represents a significant level of over-capacity for the volume of milk products being processed.

The mix of farm size, location, nature of roads and weather creates logistical challenges and higher cost to deliver raw milk to plants and elsewhere. Freight costs related to bulk milk

transported between Montana plants and all bulk and packaged milk shipped out-of-State is fairly significant. Additionally, out-of-State bulk shipments incur brokerage and other fees, all of which negatively affects the economic return to the Producers. Certain farms are located distances up dirt roads that can present significant challenges just to reach, especially in winter or during bad weather.

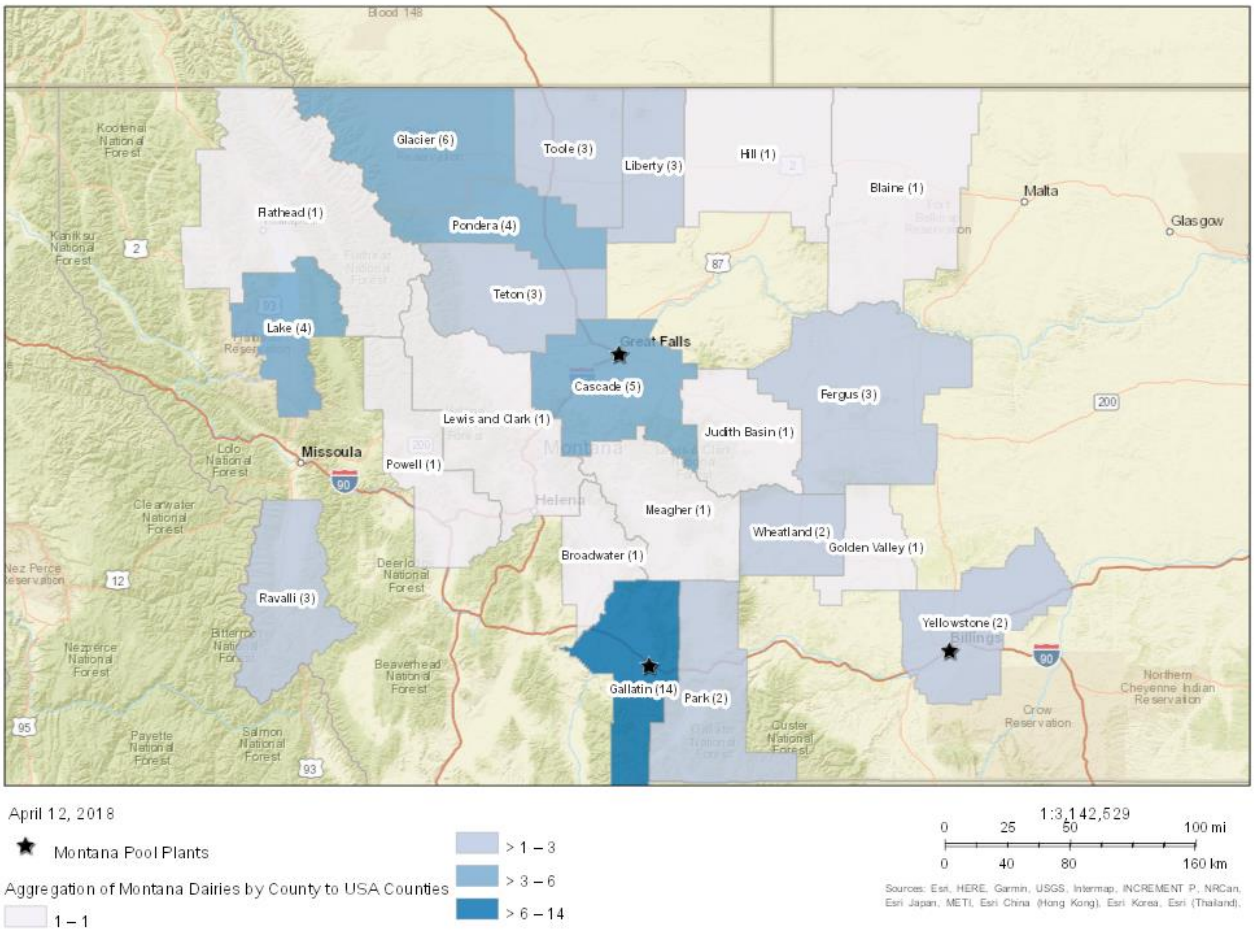
Montana dairy farms are generally small. 64% have herds fewer than 150 cows representing 32% of total cows. 22% have between 150-300 cows, representing 27% of total cows, and just 8, or 14% of farms, are larger than 300 cows and represent 40% of total cows in the state.

Many Montana dairy farms are located fairly significant distances from the processing plant they supply, especially given their size. 40% of farms, representing 53% of total cows, are fewer than 50 miles one way from their processing plant. 21% of farms, representing 16% of total cows, are 50-100 miles one way. 33% of farms, representing 17% of total cows, are 100-200 miles one way while 6, or 10% of farms, representing 14% of total cows, are greater than 200 miles one way from their primary processing plant.

Approximately 64% of the milk received by Billings from Montana based Producers during the calendar period 2015-2017 was transferred from Great Falls and Bozeman Producers, many of which are 200-300 miles away. Montana-produced milk represented approximately 69% of Billings total raw milk received during the period from Producers located both in-State and out-of-State.

The following chart illustrates where the Producers are situated relative to the Processing plants. The darker blue counties represent more farms.

Montana Dairies by County with Pool Plants



Costs related to bulk milk transported between the Montana plants and to out-of-State customers is fairly significant. Nearly 10% of calendar 2017 milk production was transferred to the Billings plant, primarily from Great Falls. The total hauling cost for these transfers was approximately $527,000, or $1.82 per cwt. The net impact on a Pool-wide basis was $0.19 per cwt.

Nearly 6% of calendar 2017 milk production was bulk shipped out-of-State, primarily from Bozeman and Great Falls. The total hauling costs for bulk milk shipped out-of-State was approximately $415,000, or $2.69 per cwt. The net impact on a Pool-wide basis was $0.149 per cwt.

In total, the hauling cost for the volume of bulk milk shipped inter-Plant and out-of-State during calendar 2017 was an average of $2.15 per cwt and the net impact on a Pool-wide basis was $0.34 per cwt. A portion of the volume shipped out-of-State by Great Falls is offset by shipments into the state to supply Billings. This means that the Pool absorbed cost to transport volumes out-of-State that was in a sense “replaced” by milk that was brought into the state.

In addition to transport costs, out-of-State bulk shipments are generally sold at a deep discount, and incur brokerage and other fees, all of which act to lower the net blended price within the Pool.

Processing capacity within Montana has declined as plants have been shut down over the last 20 years. The three remaining Pool plants in Montana are relatively old, somewhat small and currently run below capacity, which lowers their general cost efficiency.

The Bozeman plant is owned by Darigold, a regional cooperative that operates in multiple states including Montana. All of the Producers supplying milk to Bozeman are members of the Darigold cooperative with the exception of the Montana Correctional Enterprises (MCE) that supplies milk to Darigold as a member of the state-wide Pool. The Bozeman plant is a Class I bottling plant that produces approximately 15 million gallons per year running 2 shifts, 6 days a week starting Sunday and ending Friday. Outside Montana, Darigold operates two Class I bottling plants in Boise, ID and Spokane, WA that are within approximately 400 miles of Bozeman.

Meadow Gold is owned by Dean Foods, a large independent Processor that operates across the country and within the Montana region. Nearly all suppliers to the two Dean plants in Montana are independent farmers and members of the Montana Milk Producers Association which, unlike Darigold, is not a formal cooperative. One exception is a Darigold cooperative member farm that ships its milk to the Billings plant under special agreement because of its proximity to Billings and the Billings plant's need for supply. Several Producers located in Wyoming also ship milk to Billings as part of its ordinary supply.

The Meadow Gold plant in Great Falls is primarily a Class I plant that bottles approximately 7.8 million gallons per year running 2 shifts, 4 days a week. It also produces relatively small volumes of other finished products including ice cream mixes, eggnog and juices. The plant in Billings is a Class I plant that bottles approximately 4.5 million gallons a year running 2 shifts, 4 days a week.

Billings receives approximately 36% of its raw supply from Producers located nearest to it, including several from Wyoming, with the remaining 64% coming from Meadow Gold and Darigold based Producers, many of whom are located 200-300 miles away. The difference in freight from what it would cost the Great Falls and Bozeman's Producers to deliver to their home plant, and what it costs to transport the milk to Billings instead, is charged to the Pool and borne by all the Producers in the state.

Outside of Montana, Dean operates 3 Class I bottling plants in Boise, ID, Salt Lake City, UT, and Bismarck, ND, all of which are located within 400-500 miles from the various Montana plants, with another 2 plants in Greeley and Englewood, Colorado that are within 500-600 miles.

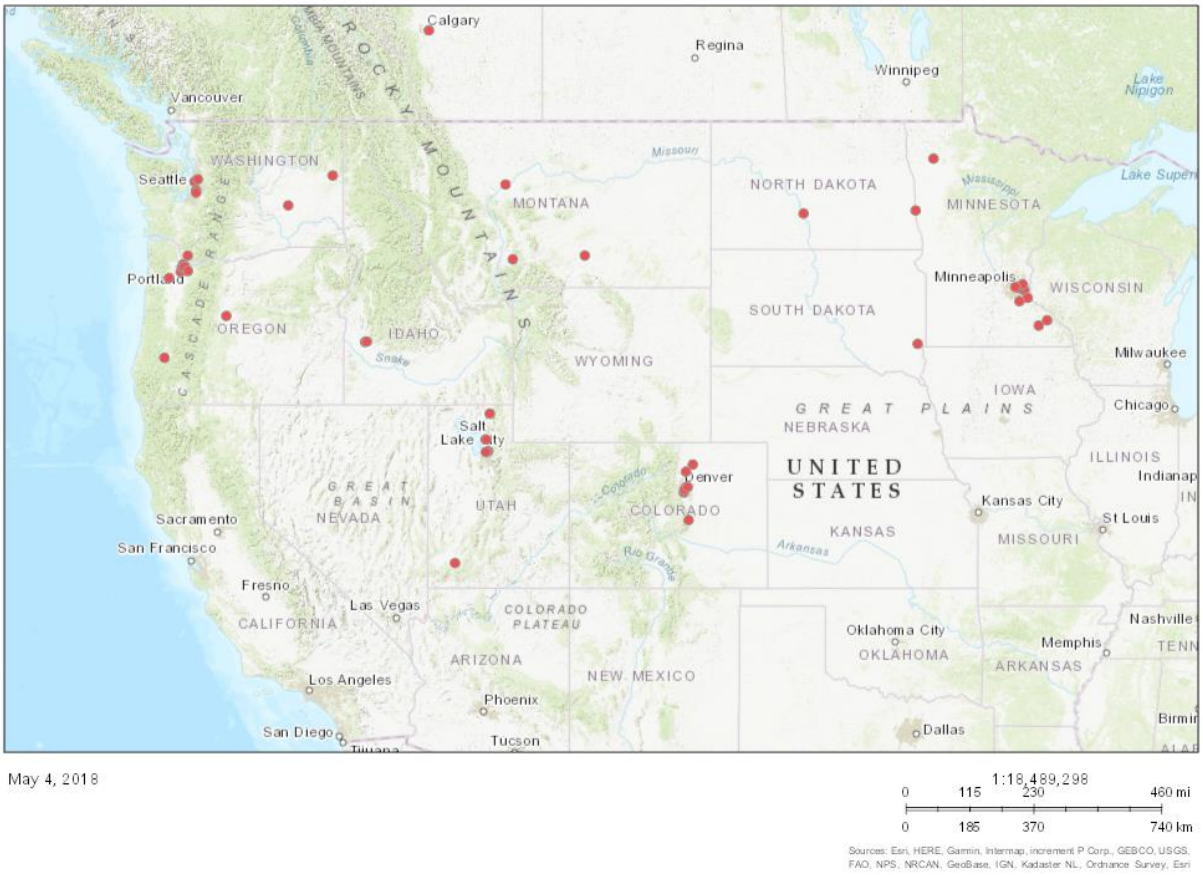
The three Montana plants together produce an average of about 27.5 million gallons of fluid milk a year. To put this in perspective, most Class I bottling plants in the US produce 20+ million gallons per year, with many plants typically producing 30 million gallons or more with the largest plants approaching 100 million gallons.

In addition to Meadow Gold and Darigold, 9 other companies operate 10 Class I plants in the region that are located anywhere from 350 – 700 miles from the closest Montana plant.

Several of Montana's closest neighboring States dwarf Montana dairy production in size and growth (see chart in Section 4.a. i. on page 24):

- Idaho's production is nearly 50 times that of Montana and its growth in production alone over the last 10 years was over 12 times Montana's total annual production. Idaho has 18 dairy processing facilities
- Washington's production is over 20 times that of Montana and its 10-year growth was 4 times Montana's total annual production. Washington has 13 dairy processing facilities
- Oregon's production is nearly 9 times that of Montana and its 10-year growth slightly exceeded Montana's total annual production. Oregon has 15 dairy processing facilities
- South Dakota milk production is nearly 9 times the size of Montana but grew more than Oregon. Its 10-year growth was 3.5 times Montana's total annual production. South Dakota has 10 dairy processing facilities and the Agropur plant recently announced an expansion that will process up to 9 million pounds of milk per day
- Like Montana, North Dakota' milk production declined over that last 10 years but still remains slightly larger (20%) than Montana
- Wyoming's milk production is smaller than Montana by approximately half, and there is no processing in-State, but production actually grew over the 10-year period by nearly 20%. Since shipments of Wyoming milk into Montana have been relatively steady over the years, it is assumed that the growth in production has been to serve other markets
- Colorado is nearly 12 times the size of Montana in milk production and has grown more than 60% over the last 10 years. Colorado has 11 dairy processing facilities

Class I Dairy Plants Surrounding Montana

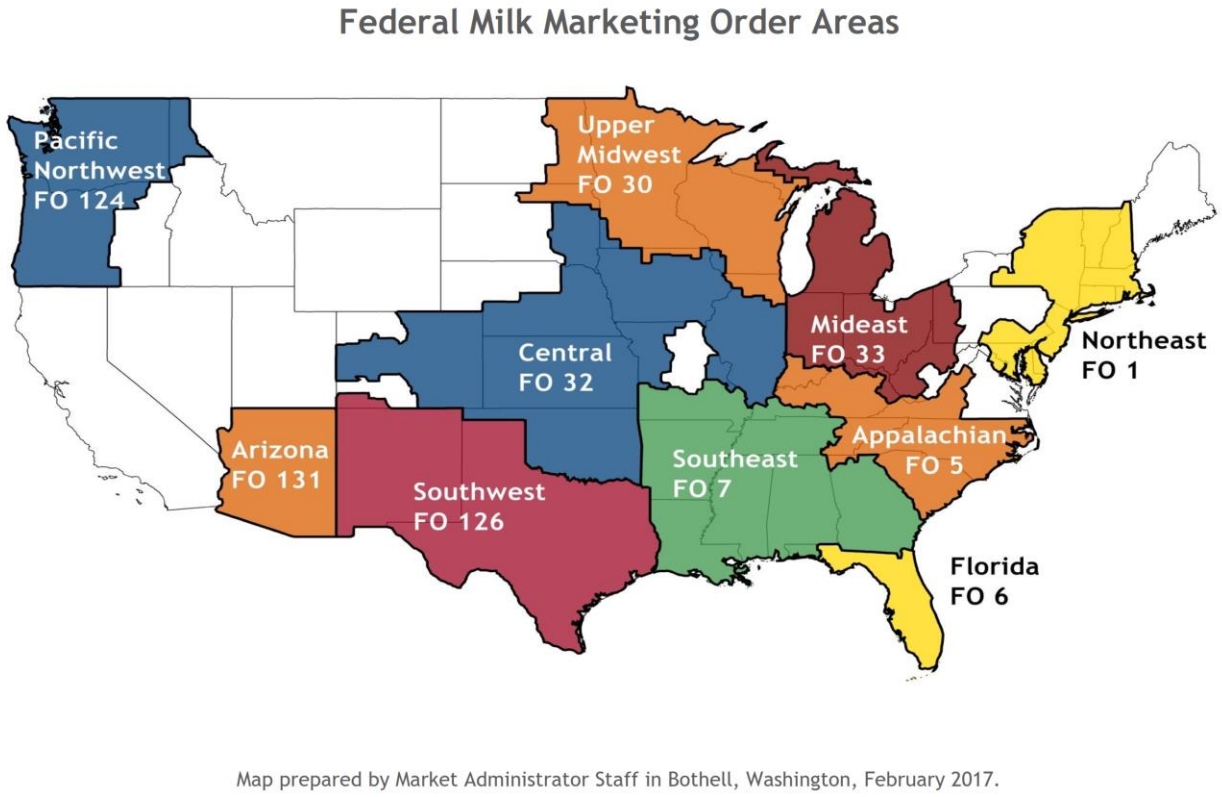


4. ANALYSIS AND FINDINGS

4.a. Study Task 1 – Price Formula Analysis & Recommendations

The objective of Study Task 1 was to develop recommended price formulas for Montana Class I, II, and III milk that balance the need for Montana Producers to receive equitable prices with the need for milk processing plants to be economically viable.

A large portion of the milk in the United States is regulated under the Federal Milk Marketing Order (FMMO). The FMMO divides the country into FMMO areas called Federal Orders. Each Federal Order has its own rules and Pool, but pricing is the same for all the Federal Orders (Class I prices vary by county based on "Zones"). The following map shows the areas that fall under FMMO regulation.



All milk that is sold into a Federal Order must be costed at the FMMO minimum price. Most of Idaho, part of eastern Oregon, and all of Utah and Wyoming are unregulated and the Processors in those regions do not have to buy milk at FMMO minimum prices. Montana, North Dakota and California are not regulated under a Federal Order but have their own regulations regarding milk pricing. This also is true for most of the other unregulated areas on the map that are not Pooled in an FMMO area . Maine, Western New York, Pennsylvania, and Virginia have state-regulated milk prices, and are based on FMMO pricing, as does Hawaii. In fact, most milk in the United States is covered by minimum Producer price regulations.

The extent of the state regulations varies from state to state. In Idaho, there are very few regulations and the plants are free to negotiate whatever price they can with farmers for the milk they require. In Pennsylvania, the unregulated portions of the state have no Pool, but the plants must still pay at least the minimum Class price for their milk. This means that a Producer who ships to a Class I plant may receive close to Class I for their milk. However, if 25% of the milk from the plant is sold into a regulated area (and all of the major population centers are in regulated areas), then the whole plant becomes Pooled.

The current Montana Milk pricing formula for Class I is based on the FMMO Class I Price. Montana's Class II and Class III milk prices use formulas that are similar to the Federal Order formulas, but they use different adjustment factors and they are based on the last prices (market prices) for Nonfat Dry Milk and Butter reported prior to the 20th of the prior month in the National Dairy Market News Weekly Report published by USDA Agricultural Marketing Service.

Basing Class pricing on the FMMO, as is done now for Montana Class I, simplifies the monthly calculations and makes Montana more consistent with neighboring States. While most of the neighboring States are not part of the FMMO, their pricing is generally based on the FMMO prices.

4.a. i. Summary of Neighboring States

The following chart provides a summary of dairy industry information of the states within Montana's region.

Comparison of State Dairy Industry Statistics

		Idaho	Washington	Oregon	S Dakota	N Dakota	Montana	Wyoming	Colorado	Utah
Processing Plants		18	13	15	10	3	3	0	11	11
Milk Production	**2006**	10,905	5,464	2,242	1,505	470	354	118	2,547	1,747
(mm lbs)	**2016**	14,665	6,650	2,593	2,546	345	295	140	3,923	2,095
US State Rank		4	10	18	19	35	36	42	15	21
Growth in 2016 vs 2015		3.9%	0.7%	1.6%	7.9%	3.9%	-1.3%	3.2%	4.4%	7.9%
Number of Dairy Cows	**2006**	488	237	118	81	32	19	7	110	86
(1,000 head)	**2016**	595	276	125	115	16	14	6	151	92
US State Rank		**4**	**10**	**18**	**20**	**35**	**37**	**45**	**15**	**22**
Milk / Cow	**2006**	22,346	23,055	19,000	18,580	14,688	18,632	17,612	23,155	20,314
(lbs / year)	**2016**	24,647	24,094	20,744	22,139	21,563	21,071	23,300	25,980	22,272
US State Rank		**3**	**6**	**28**	**17**	**20**	**22**	**11**	**1**	**14**
Forage Prod. (1,000 tons) 2015		13,751	6,232	4,971	12,985	6,930	6,340	2,882	6,930	3,776
US State Rank		**7**	**19**	**22**	**8**	**15**	**17**	**29**	**15**	**26**
Licensed Herds	**2006**	690	610	320	600	320	110	30	170	320
	2016	520	480	230	235	85	65	10	120	180
US State Rank		**15**	**16**	**23**	**22**	**37**	**40**	**47**	**31**	**26**
Average Herd Size	**2006**	707	389	369	135	100	173	223	647	269
	2016	1144	575	543	489	188	215	600	1258	511
US State Rank		**8**	**11**	**12**	**15**	**24**	**22**	**10**	**4**	**13**
Gallon Production per person per month		84	9	6	29	4	3	2	7	7
US State Rank		**1**	**11**	**18**	**5**	**22**	**24**	**25**	**15**	**17**
Dairy Receipts (million $$)		$2,352	$1,133	$471	$435	$56	$44	$25	$664	$376
Population (2016 US Census)		1,680,026	7,280,934	4,085,989	861,542	755,548	1,038,656	584,910	5,530,105	3,044,321

Source: Progressive Dairyman, 2015 and 2016 U.S. Dairy Statistics, US Census

Idaho

Idaho has everything from small dairy farms to some of the nation's largest. 27.2% have 200 or fewer cows whereas 18.9% have more than 2,000 cows with the remainder spread fairly evenly in between. Idaho is home to 18 dairy processing plants that produce a wide variety of dairy products. The affiliations of its Producers consist of approximately 70% independent farms, 17% with Darigold and 15% with DFA. A number of large farms (2,000+ head) have closed and sold out in the recent past, having lost their market for milk.

Idaho operates under a free market pricing structure for supplying milk to the plants. Plants set and/or negotiate the price they pay farms for raw milk (Classes I, II, III and IV) based off the CME and Federal Order Class III. Often, the plant determines where the finished good price must be and works backwards to calculate what they are willing to pay for raw milk. Recently, the price for milk paid to the farmers has been trending down.

For example, a source knowledgeable of the Idaho dairy industry indicated that Chobani, a very large national yogurt manufacturer, offered to pay Class IV price for milk intended for a Class II product and attracted no new suppliers.

Under its "Component Law", the Idaho State Department of Agriculture enforces and audits what the farms receive for their components (fat, protein, somatic cell and bacteria). The Department periodically tests the plants to ensure each plant's lab results fall within a certain allowed variance and that farms are being paid correctly for their component content. In addition, plants offer quality programs.

Farms pay the cost of hauling their milk to the plant. Idaho has no Quota or Pool program, although Darigold has a program where its members have an established base. Other Processors have loose arrangements where their independent raw milk shippers must ask if they can increase their herds.

North Dakota

North Dakota has 3 processing plants that process one or more dairy products. The state has its own pricing formula for Class I milk that is based off the Federal Order 30 Class I zone price at each plant. The prices move in $0.21 increments as shown in the following reference table.

Order 30 Class I	ND Class I
$13.76	$14.39
$13.55	$14.18
$13.34	$13.97
$13.13	$13.76

The minimum price paid in North Dakota is $13.76 and prices increase in $0.21 increments based off of the Order 30 Class I pricing. If the Federal Order 30 Class I price moves above $13.13 then the ND Class I price would move to $13.97. It would stay at that price until the Federal Order 30 price moved above $13.34, at which point the ND Class I price would move to $14.18 and so forth. Likewise, if the Federal Order 30 Class I price moved from $13.60 down to $13.53 then Class I in ND would move from $14.39 to $14.18.

Since the pricing is a step function, the ND Class I "Differential" over the Mover varies. The Federal Order Zone Differential is $1.65, so the actual ND Class I Differential varies between $2.29 and $2.49. This is only slightly less than the Montana Differential of $2.55.

North Dakota also regulates the minimum wholesale price of milk. The reason the chart jumps in increments of $0.21 per cwt is because it is equivalent to a $0.01 change in the wholesale price per half gallon.

North Dakota has no Pool or Quota system. Each plant is effectively its own Pool and pays its blended price for all the milk it receives. In dealing with excess milk, the plants must do their best to balance their raw intake to sales and sell their excess milk. However, all the plants use Cooperatives to balance their supply, so they rarely have any excess. In the rare case where a North Dakota plant diverts milk out-of-state, it must pay the applicable ND price for the Class of milk as it will be used. The state audits that the selling plant is charged for the specific use. Farmers pay only for hauling charges to the first plant and are not charged for any inter-Plant hauling fees.

The Class III milk price in North Dakota is the FMMO Class III price less 4%, which is a discount of approximately $0.50 / cwt.

South Dakota

South Dakota has 10 dairy processing plants that process a variety of dairy products and has just announced a new cheese plant that is eventually expected to process up to 9 million pounds of milk per day. The state has 2 different Federal Orders, with the Central Federal Order being the predominant one and the Upper Midwest being the other. Most of the raw milk is produced & processed in the eastern part of the state. There is no state managed Pool or Quota system, although Land O'Lakes has its own informal program. Pricing from farm to plant is based off the FMMO. The current pricing to cheese plants is Class III plus $1.70 plus component premiums. The farms pay for hauling from the farm to the plant.

Utah

Utah has no controls or jurisdiction over milk pricing and does not operate under any state Pool or Quota program. Approximately 48% of the dairy farms in Utah are members of DFA. The remaining farms are independent and negotiate pricing with the processing plants. The dairy farms pay the hauling from their farms to the first plant. If the milk needs to be sent somewhere else the buyer usually pays the trucking. The base price dairy farmers in Utah are paid comes from the particular market where the milk is sold. The price is determined by the coops and Processors and is a blend of Federal Order Classes I, II and III. Premiums are paid for butterfat content above 3.5% and low somatic cell count (400,000 or below). Premiums generally are not paid for volume, proteins, or solids.

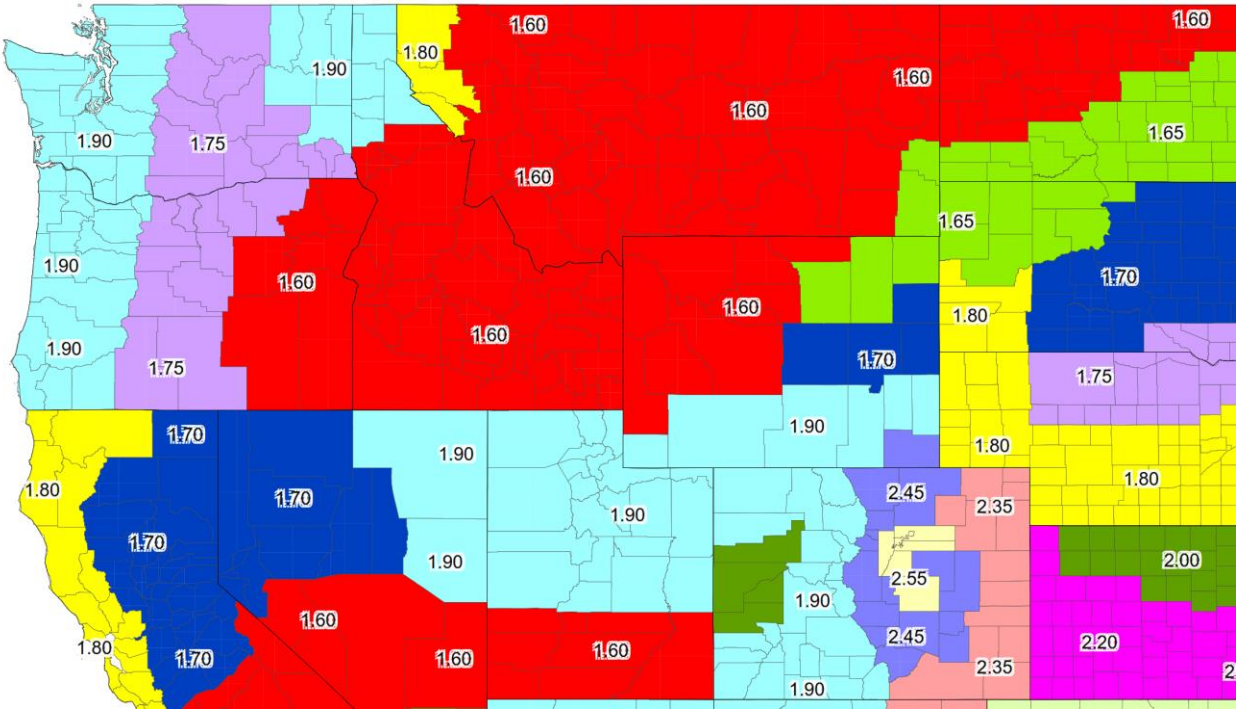
Wyoming

Wyoming is the smallest state in the region in terms of milk production and the state has no processing facilities. As a result, Wyoming has no regulations, control over, or management of the state's milk pricing.

4.a. ii. Montana Class I Pricing

Bottled milk for retail sale is considered Class I milk. Class I pricing is based on the FMMO "Mover" (derived from the greater of the Advanced FMMO Class III or IV prices) plus a Differential that is added to the Mover. For the FMMO (and for most regulated markets) the Class I pricing depends on the location of the receiving plant. A Zone Differential is added to the Mover to determine the total cost paid for Class I milk. The FMMO Zone Differential for most of Montana, including the locations of the three Class I plants, is $1.60. However, Montana does not use the FMMO zones.

The Pricing Surface for Class I Differentials for the Northwest



The Zone Differentials in the Pricing Surface above are only used by plants that are Pooled in a Federal Order. While the rules vary for each Order, generally a Class I plant is required to be Pooled in the Federal Order where it ships its milk. Once Pooled, the minimum price a plant must pay for Class I milk is the Mover plus the Zone Differential. For the Montana plants, instead of using the FMMO Zone Differential, the Montana Order uses a "Montana Differential" of $2.55 as compared to the FMMO of $1.60. Using the Montana Zone Differential instead of the FMMO Zone Differential added $1.4 million to what was paid to Montana's Producers in calendar 2017. The original basis and calculation for the Montana $2.55 Differential is unknown

and was put in place many years ago before the tenure of the current Board of Milk Control and staff.

At present the Montana Differential of $2.55 is about $0.65 to $0.95 higher than the Class I Differential paid by non-Montana based plants in the region and especially to the west (although it is only about $0.05 to $0.25 per cwt higher than North Dakota). This makes retail markets in Montana attractive to out-of-State Processors since their cost of raw milk is lower.

Increasing the Montana Differential above its current $2.55 would make delivery from out-of-State more attractive. The cost of bringing milk into the western part of Montana from the nearest fluid milk plant outside the state (around 200 miles away in WA) is estimated to be about $1.30/cwt or less, assuming no back-haul. This is not much more than delivering milk to western Montana from the Great Falls or Bozeman plants. Increasing the Montana Differential would widen the spread from the already lower raw milk costs in neighboring states, and that, combined with assumed lower production costs for out-of-State bottling plants, would create a situation that could allow out-of-State plants to serve the populated western areas of Montana more competitively than the Montana based plants.

Conversely, lowering the Montana Differential would make it less attractive for out-of-State Processors to deliver into Montana. However, lowering the Montana Differential would directly reduce revenue to Producers. Each $0.05 reduction in the Montana Differential would lower total revenues to the Pool and to Producers by approximately $73,500 per year, based on Montana's calendar 2017 Class I utilization of 146.9 million pounds for the Montana market.

For Processors, lowering the Montana Differential would likely have little to no impact, since they typically pass changes in their raw milk cost along to their retailers, although a Processor could decide to keep the additional profit if allowed within the agreement with their retailer. Likewise, retailers are free to decide whether to pass price changes on to consumers and will generally do so to a certain extent based on their local market conditions and competitive pressure. Lowering the Montana Differential could be considered if other changes were implemented that acted to offset the reduced revenues to Producers, or that resulted in an improved net price per cwt that Producers were paid for all the milk they produce.

At present we see no compelling reason to adjust the current Class I Montana Differential of $2.55 and our recommendation is to leave it at its current level. None of the stakeholders we talked with, including Processors and Producers, expressed any issue with it or suggested that it be adjusted in any way. There does not presently appear to be significant competitive pressure from out-of-State Processors or distributors on Montana's Class I fluid market, although this could change over time. The $2.55 Montana Differential is well established and, given the changes that may occur as a result of the recommendations in this report, it makes sense to maintain stability in this core component of Montana's milk market.

However, Montana could consider lowering the Class I Differential somewhat if it felt that it was necessary or appropriate. A lower Class I Differential would provide a slightly more competitive price within the region and help protect against encroachment from out-of-State Processors for Class I fluid sales.

Any new Differential should be based on an analysis of total Producer income and regional pricing. Consideration should be in line with recommendations regarding Pooling, Quota, Inter-Plant Hauling, and out-of-State product utilization pricing, to give Producers choice as to managing their individual level of production. To the extent that other Quota and Pooling related recommendations are adopted, and given their delivery costs, it may potentially place more pressure on remote Producers and this impact should be included in any evaluation.

Under any structure, there should be sufficient flexibility in place to make adjustments to the Montana Differential in an appropriate and timely manner to meet future conditions, and a mechanism should be put in place to ensure this can happen. Such mechanism could be set up to be reviewed and addressed on an annual basis taking, for example, the last three years into account and evaluating such factors as overall and Excess production, Montana's share of the in-State Class I market, Class I pricing in neighboring states, and input from Pool Processors and Producers as to the advisability of a change.

4.a. iii. Montana Class II

The current Montana Class II price uses a formula that is similar to the Federal Order formula, but uses different adjustment factors and is based on the last prices (market prices) for Nonfat Dry Milk and Butter reported prior to the 20th of the prior month in the National Dairy Market News Weekly Report published by USDA Agricultural Marketing Service.

The formula used by Montana results in lower pricing than the Federal Order formula, such that if the Federal Order pricing had been used during calendar years 2015-2017, the total Class II revenues to the Pool would have been approximately $144,000, $68,000 and $170,000, or 5.7%, 2.5% and 5.7% respectively, higher for Class II utilization value. The higher value into the Pool would have been paid to the Producers, while the impact on the cost side would most likely have been slightly higher prices to retailers or possibly somewhat lower profits for Processors. Note that the calculations do not take into account changes in inventory reclassification value, which would change the results by a few thousand dollars each year.

	Class II Utilization Value		
	2015	2016	2017
Current Montana Pricing	$2,515,334	$2,747,858	$2,958,686
Federal Order Pricing	$2,659,603	$2,815,402	$3,128,715
Difference	$144,269	$67,544	$170,029
Percent Difference	5.7%	2.5%	5.7%
Value to Pool per CWT	$0.0504	$0.0242	$0.0597

The FMMO Class II price for Skim is based on Advanced prices and is announced with the Class I prices just prior to the month they will take effect. The FMMO Class II Butterfat price is announced at the end of the month with the other Final prices. If Federal Order pricing were to be adopted for Class II, it may be desirable to calculate the Class II Butterfat price based on Advanced prices similar to the way Montana does it today.

The FMMO announces an Advanced Butterfat price that is used in the calculation of the Class I Butterfat price. If that price were used instead of the Final Butterfat price, and the same FMMO calculation was performed (Class II Butterfat = Butterfat Price + $0.007), then the pricing over the last 3 years would have been higher than the current Montana price, but not as high as the actual Federal Order price as shown in the following chart.

	Class II Utilization Value		
	2015	2016	2017
Current Montana Pricing	$2,515,334	$2,747,858	$2,958,686
FO Pricing - Adv BF	$2,564,525	$2,848,112	$3,092,430
Difference	$49,191	$100,255	$133,744
Percent Difference	2.0%	3.6%	4.5%
Value to Pool per CWT	$0.0172	$0.0359	$0.0470

Ordinarily, for the sake of simplicity and uniformity, we would recommend using the FMMO Class II price. However, we believe there is benefit to using Advanced pricing for Montana for several reasons. First, the value difference of the two methodologies is relatively minor. The second reason is that for planning and decision-making purposes, it is useful for Processors to know their cost in advance. Finally, Advanced Class II pricing would allow the Milk Control Bureau to continue releasing a single price announcement each month, as is currently done. This saves administrative effort and cost as opposed to the Bureau having to issue two price announcement each month.

For these reasons we recommend that Montana use the announced FMMO Class II skim price and calculate the Montana Class II butterfat price as $0.007 over the announced Advanced butterfat price.

4.a. iv. Montana Class III

In Montana, Class III represents all milk that is not Class I or Class II, whereas the FMMO has a distinction between Class III for cheese and Class IV for butter and powder. Montana Class III pricing is based on a formula that at one time resulted in prices very similar to Federal Order Class III. Over time this changed such that the Montana Class III pricing formula currently results in a Butterfat price that is $0.50 to $0.60 per pound lower than the Federal Order Class III price (note that Federal Order Class III and Class IV skim prices are different, but they use the same Butterfat price).

Montana Class III covers the sale of bulk raw milk and cream shipped to cheese, butter and powder manufacturing plants, mostly out-of-State. It is also used to price the first 2% of shrink, or loss, that is allowed as a normal consequence of processing milk at a plant. Any shrink above the 2% allowance is priced at Class I.

A major impact of the lower Butterfat price in Montana is that it creates opportunities for profitable sales and increased margins for the Processing plants. Class I bottled milk averages around 2% butterfat while raw milk is around 3.7%. The remaining Butterfat is bottled as a cream product (half and half, light cream, whipping cream, etc.), used in an ice cream product, or sold as bulk cream. Every 100 pounds of raw milk used in making Class I products generates about 4.5 pounds of cream.

This bulk cream is sold by Montana Processors to out-of-State butter plants at prices in line with the national butter price. This provides them with a significant profit because their cost is Montana's lower Class III Butterfat price. The benefit of the lower Butterfat price to the Processors is an equivalent loss of value paid to the Pool from what it would have received if Federal Order prices were used. For perspective, had Class III pricing been based on the lower of Federal Order Class III or Class IV pricing rather than Montana Class III pricing for the last few calendar years, the Pool, and subsequently the Producers, would have received an additional $2.7 million, $2.6 million and $2.9 million (or $0.94, $0.90, and $1.05 per cwt) in calendar years 2015-2017 respectively.

	Class III value difference between Montana and Federal Order pricing		
	2015	**2016**	**2017**
$ millions	$2.728	$2.583	$2.927
Value to pool per CWT (Total Utilization)	$0.94	$0.90	$1.05

We recommend that Montana adopt the lower of the FMMO Class III and Class IV pricing for its Class III price, and to be consistent with the rest of Montana Class pricing, it should be based on Advanced pricing. If FMMO Advanced pricing had been used to calculate the Montana Class III for the last three calendar years, the Pool, and subsequently the Producers, would have received an additional $2.6 million, $2.9 million and $3.0 million (or $0.88, $1.00, and $1.06 per cwt) in calendar years 2015-2017 respectively.

	Class III value difference between Montana and Advanced Federal Order pricing		
	2015	**2016**	**2017**
$ millions	$2.555	$2.857	$2.955
Value to pool per CWT (Total Utilization)	$0.88	$1.00	$1.06

As with Class II, for the sake of simplicity and uniformity we would ordinarily recommend using the FMMO Final prices that are announced at the end of the month in which they take effect.

However, for Montana, we believe there is benefit to using Advanced pricing for several reasons. The difference between calculating the Montana Class III price on Advanced and Final pricing over the last few years has not been significant. For planning and decision-making purposes, it is useful for Processors to know their cost in advance. It may be useful in trying to attract a Class III plant, since knowing the cost of product as it is made would allow for better control of Class III product sales. And finally, advanced Class III pricing would allow the Milk Control Bureau to continue releasing a single price announcement each month, as is currently done. This saves administrative effort and cost as opposed to the Bureau having to issue two price announcement each month.

An additional benefit of basing the Montana Class III on the lower of FMMO Class III and Class IV is that the cost of milk for a cheese plant, which is FMMO Class III in Federal Orders, would usually be FMMO Class IV in Montana. In other words, the cost of milk for the cheese plant would be equal to or usually lower than their cost in FMMO regulated markets.

Moving to Advanced Class III pricing based on FMMO pricing, and transferring the values noted above from the Processors to the Pool (i.e., Producers) would have a significant immediate impact and potentially serious short-term consequences in terms of the Processors profitability and viability. To ameliorate this near-term impact on Processors, we suggest that the Class III Butterfat price be adjusted downward by $0.20 - $0.30 per pound. This adjustment could be applied temporarily to allow the impact of the full change to be absorbed and managed over time, or it could be made permanent. A benefit of making the adjustment permanent is that it may help attract additional Class III Processors to Montana. We recommend a $0.25 per pound (approximately 10%) reduction to the butterfat price that reduces to around $0.10 (approximately 4%) over three years.

4.a. v. Montana Surplus Milk

Sales of milk that go out-of-State are defined as Surplus Milk. By administrative rule [ARM 32.24.150(42)], all milk produced by Montana Producers that is not processed and sold for consumption within Montana, or transferred to another Pool plant in Montana, is defined as Surplus Milk. Surplus Milk excludes shrink, inventory and fluid cream products.

Surplus Milk is disposed of in several ways: Packaged Class I fluid products are processed in-State and sold in markets in contiguous and non-contiguous States, for which Montana allows special discounts from the Class I price; bulk Sales of raw milk are made to Class I Processors out-of-State, none of which occurred in calendar 2017; and Bulk Sales of raw milk are made to Balancing plants which are typically cheese or powder plants located outside the state.

Current administrative rules provide for adjustments to the utilization value of the milk to reflect the actual sales price of Bulk Sales and hauling charges. Effectively, it is as if the Producers sold the milk directly to the out-of-State Balancing plant. The Processors in Montana each attempt to utilize Surplus milk in a way that creates the highest value. If possible, it is sold

as Packaged Surplus to other states which improves its utilization value over a Surplus Bulk sale. The rest is sold as Bulk milk.

Processors encourage their Producers to limit the production of Surplus milk, although this has not been very effective given the current Quota system, as discussed elsewhere. Given this situation, the Processors assist farmers in finding buyers for Surplus milk and provide this assistance at no cost to the farmers and at no profit to themselves. In general, the best strategy is to maximize sales of Montana Class I milk, which minimizes the amount of Surplus at the Processor.

Since the strategies of each Processor have a direct effect on the value of Surplus milk, it may make sense to adjust the structure for Quota and Pooling in Montana to more fairly allocate the value of Surplus milk. This is discussed more fully in Section 4.d., Study Task 4 on page 43.

4.a. vi. Variable Class I Price Formula to Manage for Seasonality

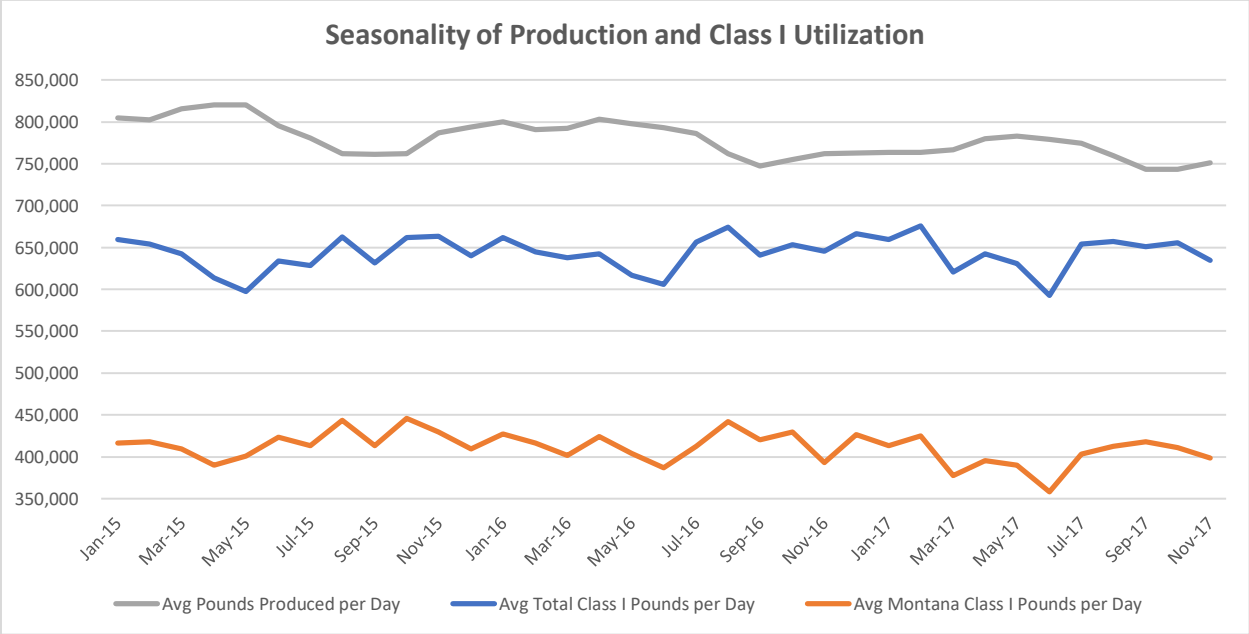
Seasonality of milk production occurs mostly because of traditional cow cycles. Cows naturally tend to calve in the fall/winter and peak milk production occurs in the spring (May/June in Montana). This natural cycle has traditionally been followed because cows are stressed during the heat of the summer months. When temperatures get over 65-70 degrees Fahrenheit, milk production suffers. Additionally, if calving occurs during these higher temperatures, the calf is stressed, and it can impact milk production over her entire life.

Cows can be inseminated at any time, so the timing of calving can be managed. In this manner, the production cycle can be shifted so that it occurs at any time throughout the year. However, calving during peak summer heat is usually avoided. Many larger farms (over 500 cows) manage their herds so that calves are born throughout the year. Even so, there is still some seasonality because of temperature variations.

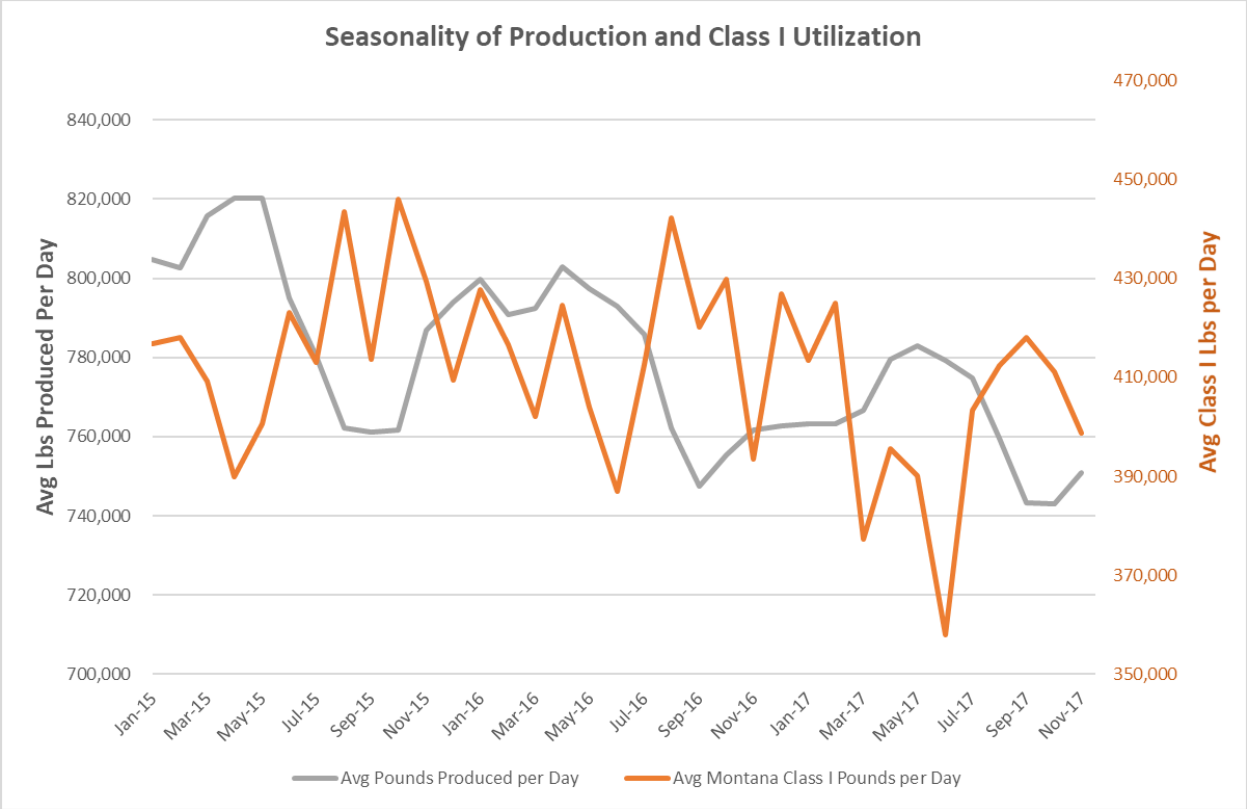
Seasonality in the milk supply in Montana is similar to other parts of the country. The difference in milk production between the months with the most volume (May/June) and the least (October) each year is about 7%. The usage of Class I milk also is cyclical, with peaks occurring a number of times during the year, but with a definite low during May and June when supply is highest. The difference between the month with the most volume and the least volume each year is about 11%.

The following chart shows monthly daily averages in Montana for the last 3 calendar years for:

- Average daily production
- Average daily total Class I Utilization (including out-of-state utilization)
- Average daily Class I utilization in Montana



To better see how the volumes of production and Class I usage compare, the usage was scaled so that the lines overlap. The scale on the left is average daily production, and on the right is Montana in-State Class I usage.



As can be seen in the chart above, the peaks and valleys between supply and usage are not aligned. When consumption is increasing, milk supply is decreasing, and vice versa. This is not an issue today because overall production is significantly greater than Class I demand such that even at its lowest point, production exceeds demand at its highest point on a daily basis. But if overall production were to decrease significantly to the point where supply on an annual basis was very close to annual Class I usage, then this seasonality effect could become a problem.

If total supply were to decrease, or demand increase, to the point where it became useful to better match supply with demand, it is possible to implement policies that encourage shifting supply. However, to the best of our knowledge, there have been few large-scale or critical situations where seasonal supply has been effectively adjusted to match demand. In fact, cooperatives across the US have generally found it more effective to build balancing plants to seasonally utilize milk when supply exceeds demand, rather than to try to encourage a smoothing of the supply.

As early as the 1930s, but more recently in the 1960s, there were several Federal Order areas that established seasonal rules. Most had "base-Excess" plans or the "Louisville" plan. Base-Excess plans establish a base and any volumes in Excess of the base are paid for at a lower rate. The Louisville plan retains money from the blend price during the spring months and uses it to supplement payments to Producers during the fall months when milk production is lower. This plan increases the price paid to farmers for milk sold in the fall and lowers the price of milk during flush spring months, without affecting prices charged to the Processors.

Several studies were performed during the 1980s and early 1990s to determine the effectiveness of these rules in diminishing the seasonality of the milk supply (Kaiser, Prindle, etc.). The studies confirmed that implementing seasonal controls did help to reduce seasonality somewhat, but they also concluded that the reductions in seasonality were not very large and that enhancements to the programs in the form of larger incentives and penalties might have improved the results.

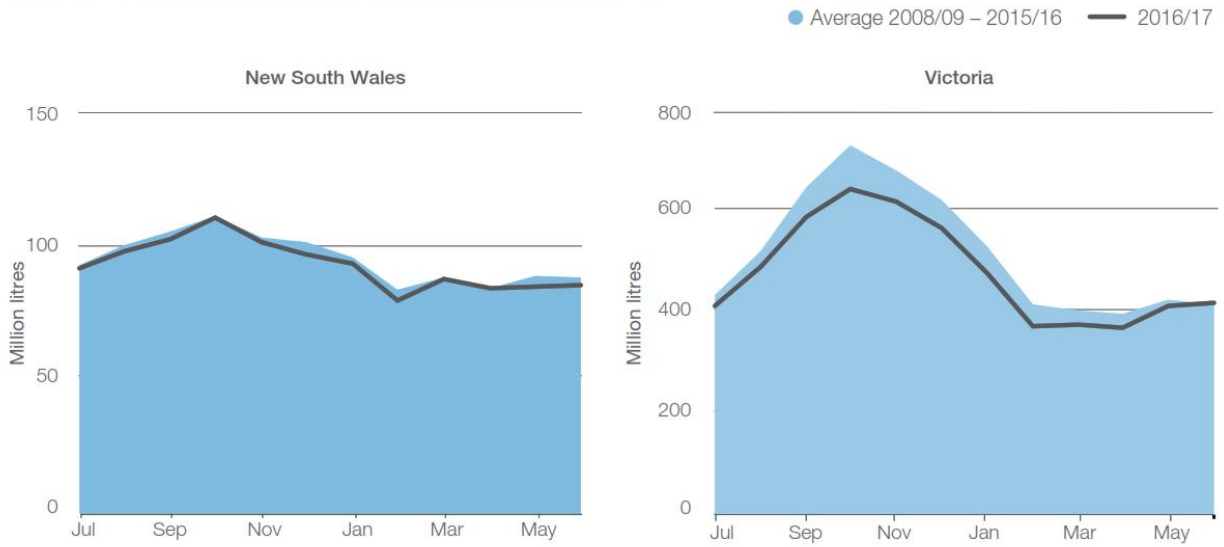
When the Federal Orders were restructured in 2000, the seasonality that had been built into some of the Orders was eliminated. None of the Federal Orders have seasonality rules today.

Some states have a larger seasonal mismatch in supply and demand than others. One example is Florida where large swings in production and a mismatch with demand are caused primarily by the high summer heat and its effect on cows and on the availability of forage. Millions of dollars are spent importing milk during the Summer and Fall, and then spent again shipping Excess milk out of Florida in the Winter and Spring. In the 1990s, Florida coops experimented with incentives to shift milk production to meet demand. The experiment lasted 2 years and was abandoned [Choices magazine, 4th Quarter 2003 "Reducing Seasonality in Dairy Production" by Richard N. Weldon, Andrew A. Washington, and Richard L. Kilmer].

Our research did not identify any more recent significant studies on seasonality incentives. The incentive that was introduced in Florida was a $3.00 premium on production in the Fall that exceeded 75% of Spring production. A number of farms implemented procedures to shift more of their production to the Fall and were moderately successful, but other farms simply increased their overall annual production to take advantage of the premium in the Fall so that the net effect was very little change to seasonal matching of supply and demand. Even though the program achieved limited success in shifting some supply, it was terminated after a few years because it apparently did not shift enough volume to justify maintaining it.

In Australia, milk production was down in 2016-17, but remains strongly seasonal in the key south-eastern dairying regions, reflecting the predominantly pasture-based nature of the industry. Milk production peaks in October, tapers off until late-summer, and then flattens out into the cooler winter months (See Victoria below). The production of long shelf-life manufactured products in these parts of the country has enabled maximum milk utilization within the seasonal cycle. However, the seasonality of milk output in Queensland, New South Wales and Western Australia is much less pronounced, due to a greater focus on drinking milk and fresh products. Farmers in these states manage calving and feed systems to ensure more even, year-round milk production, and they have been incentivized to do so for many years. In other words, in the parts of Australia where fluid milk comprises a large part of milk utilization, the Producers have successfully managed to reduce seasonal differences. The implementation is similar to the Florida experiment, where an incentive in the "trough" months based on a percentage of the volume in the "flush" months is used. The following charts show the effectiveness of the plan in New South Wales where there have been incentives to minimize seasonality, compared to Victoria.

Figure A1 Seasonality of milk production 2016/17 (million litres)



From Dairy Australia – "Australian Dairy Industry in Focus 2017"

In theory, a mechanism could be put in place in Montana to shift some milk production from the Spring to the Fall to more closely match seasonal demand so long as the incentive is well designed and does not encourage and result in simply increasing overall production. Although summer heat is not as large an issue in Montana as it is in the South, shifting production would reduce some volume and likely raise costs for the Producers. The incentive payments would need to cover these increased costs of production.

If having sufficient supply In Montana becomes an issue, some sort of incentive program could be implemented to more closely match supply with demand throughout the year. However, given that Montana currently has more than sufficient milk supply to meets its Class I demand for the year, implementing seasonal incentives to try to match production with Class I usage during the year does not seem necessary.

4.a. vii. Component Pricing

The Federal Order System provides a mechanism for Component Pricing for Class III and Class IV milk that adds value to what Producers can receive. With Component Pricing, instead of paying for Skim on just a per pound basis, the Skim is valued based on its Total Solids Not Fat content for Class IV, and on Protein and Other Solids content for Class III. In six of the 10 Federal Milk Market Orders, payments to Producers also are based on Protein and Other Solids. The other four Orders use Skim and Butterfat.

The component pricing mechanism encourages the use of higher Protein milk for Cheese and Powder (Class III and Class IV) where it has more value. Since there are no cheese or powder plants in Montana, there currently is no need for Component Pricing. On the other hand, establishing a component-based formula may be something to consider. Even though it would not currently affect milk sales and utilization, it could help to attract potential investment in facilities (e.g., cheese) where component pricing would be attractive. This is one aspect to consider, in conjunction with the discussion and recommendations provided in this report under Study Task 5.

4.b. Study Task 2 – Recommendations for Adjustments to Utilization of Class I Packaged Milk Sold as Surplus Milk

4.b. i. Surplus Packaged Milk

In conjunction with the evaluation of the basic Class I price formula, we evaluated the adjustment to the utilization value for Pool milk sold as Class I packaged products to markets outside Montana to determine whether it was necessary or appropriate to revise the currently allowed adjustments.

The Montana Class I cost for raw milk is $2.55 over the Federal Order Mover (higher of Advanced Class III and Class IV prices). For packaged milk sold to customers in states

contiguous to Montana, an adjustment of $2.55 is made to lower the Class I price paid to the Pool, which effectively prices the milk at the Mover. If the milk is being sold to customers in states that are non-contiguous to Montana, the adjustment to lower the Montana Class I price is $3.05, which results in a price that is $0.50 below the Mover.

We are not aware of the specific basis for how the contiguous state adjustment of $2.55 was established other than it offsets the Montana Differential and effectively prices such milk at the Mover. Our understanding is that the adjustment for packaged sales to non-contiguous states of $3.05 was established primarily to take advantage of an opportunity to utilize what was otherwise Bulk Surplus milk for sale as packaged Class I milk to a specific customer with retail outlets in non-contiguous states.

Based on our analysis, the estimated cost of delivering a full load of packaged milk to a customer that is 400-500 miles away is approximately $3.00 to $3.50 per cwt. The local cost of Class I milk in the non-contiguous State's market is approximately $1.90 over the Mover, plus any local premiums. We estimate local delivery in that market is approximately $1.00 per cwt, so the total cost for a Processor in that state to deliver packaged milk is approximately $3.00 per cwt over the Mover. The net result is that the total Montana adjustment of $3.05 for packaged sales in non-contiguous states, along with the estimated freight cost of $3.00 to deliver such product, makes Montana packaged milk competitive in the market of the non-contiguous State up to 400-500 miles away.

It should be noted that all the packaged volume currently being sold in non-contiguous states is based on a contract with a single customer with multiple outlets and is not spread across a portfolio of customers. In addition, given the geography in the Northwest, potential customers in non-contiguous states could actually be closer than customers in contiguous states.

4.b. ii. Background

Montana is almost unique in the sense that there are very few States we are aware of that discount the Class I cost of milk for any reason. Montana has the least number of cows and milk of any State in the region with dairy processing facilities (Wyoming has fewer cows, but has no processing facilities), but Montana does produce significantly more milk than it needs to meet it's available in-State sales.

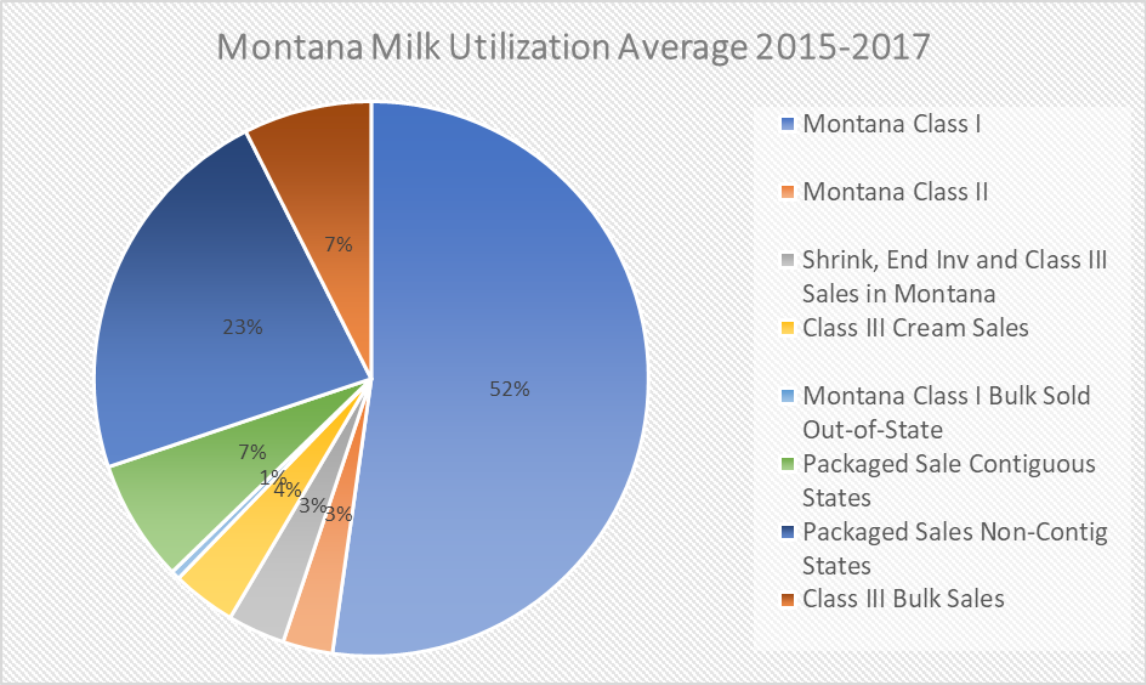
The discounts on packaged milk sold out of the state serve to help Montana's Processors utilize and realize value from what would otherwise be Bulk Surplus milk. Other states have Surplus milk and, like Montana, often that milk is sold to balancing plants outside of the state. Unlike Montana however, the proportion of milk sold outside of those states is relatively small since there is sufficient balancing plant (cheese and powder) manufacturing capacity within the state to process and balance most of the milk produced in the state. Montana currently sells only a bit more than half of the milk produced in the state to outlets in the state. There are no balancing plants in Montana.

For Montana Processors, the average annual utilization by Class for the last three calendar years, 2015 – 2017, was as follows:

- 52.2% of total utilization was Class I milk sales in-State
- 2.9% on average was Class II sales in-State
- 7.1% of utilization was Class III cream, shrink, and sales to in-State Processors
- This left 37.8% on average of milk production that was considered Surplus

The utilization of the average annual 37.8% Surplus production for the last three calendar years (2015 – 2017) was as follows:

- Class I milk bulk sales to Class I Processors out-of-State was 0.5% of total production, or 1.3% of Surplus volume
- Packaged sales to contiguous states was 7.1% of total production, or 18.8% of Surplus volume
- Packaged sales to non-contiguous states was 22.7% of total production, or 60.1% of Surplus volume
- Bulk sales out-of-State was 7.5% of total production, or 19.8% of Surplus volume



All milk produced must be sold to avoid having Producers suffer a significant loss. There are two basic solutions to the problem, especially when nearly 38% of total milk produced is Surplus milk; either reduce production (discussed in Section 4.d., Study Task 4 on page 43) or find a home for the milk at the best price available, and hopefully one that provides sufficient economic value.

4.b. iii. Maximize Value of Surplus

At the current level of production, the obvious goal, shared by the Board of Milk Control, is to maximize the price Producers receive for the 38% of milk that represents Surplus milk, while not creating a detriment to Processors. Plants that take and utilize Surplus milk are considered Balancing Plants because they help to balance the milk supply. Balancing Plants generally are cheese or butter/powder plants. If Surplus milk is sold as bulk milk to a cheese or powder Balancing Plant, the price received is generally Federal Order Class III or Class IV at best, and often less. In addition, the return to the Producers is reduced by the cost of transporting the milk to that plant, plus any brokerage or other fees associated with making the sale.

In calendar 2017 the cost of transporting Bulk Surplus milk averaged $2.69/cwt and reflected charges that ranged from $2.20 /cwt from Bozeman to Jerome, ID, to $4.15/cwt from Great Falls to Logan, UT, to reach the closest available balancing plants.

To maximize the value of Montana Surplus milk, the Board of Milk Control has provided a mechanism that allows it to be sold out-of-State as packaged milk by pricing the raw milk at a discount. The milk is priced effectively at the Mover for milk going to contiguous states, and at $0.50 below the Mover for milk going to non-contiguous states.

Since the Mover is the higher of the Advanced Class III or Class IV, the price received for Surplus milk sold as packaged Class I milk is generally going to be higher than if the milk was just sold as bulk Class III or Class IV less the cost of transport. The other impact to Producers of selling the milk as Packaged Surplus is that they only pay for delivering the milk to their associated plant, with the cost of transport to the customer covered by the discount and paid for by the Processor.

By creating a discount for sales of out-of-State Packaged Surplus Milk, all packaged milk sold out-of-State will be priced at that fixed discount. Rather than mandate a fixed price, it may be more economic to declare a maximum allowed discount and then require the Processor selling the milk to justify the discount they would like to receive based upon actual costs.

One option is to allow the Processing plant that sells the milk out-of-State to receive a deduction consisting of two components from the Class I price. The first component would be the difference between the Class I price in Montana and the Class I price of the market into which the milk is being sold. The second component would address the additional cost to transport full truckloads of the product to the out-of-State location, compared to the cost of local delivery at the destination.

It is likely that, for the current non-contiguous out-of-State sales, the discount would be similar to the current $3.05 discount to the Montana Class I price but, as noted earlier, there may be customers who would be closer than what necessitates the $3.05 discount, as well as some that

would be farther away. The deductions would need to be initially justified and then reviewed on a periodic basis or any time the customer delivery locations changed significantly, to ensure they represent actual cost requirements.

A second option would be for the Milk Control Bureau to calculate what cost would be competitive in various markets. For each market, the allowable discounts could be calculated based on the Class I prices and premiums in the market, adjusted for the cost of shipping to that market. The prices could be reviewed as appropriate, either periodically or whenever there is a sufficient change in the market, such as significant change in the cost of diesel fuel.

A third option, which may only work if the Statewide Pool is eliminated or restructured from its current form, is for the Processor to contract on an open arms-length basis with its Producers to supply the required amount of milk at a discounted price. This option could be established with or without approval or oversight from the Board of Milk Control.

4.c. Study Task 3 – Hauling Unprocessed Milk Between Plants

We evaluated the current practice of having all Montana Producers share, through the Pool, in paying for the cost of hauling unprocessed milk between Montana Pool plants. In evaluating the practice, we researched whether similar practices are used in other regulated markets and whether other regulated markets set limits to the cost of hauling milk between plants that are borne by Producers. We also considered reasons why the cost should or should not be borne by Producers and considered the development of flexible formulas that would incentivize and more efficiently manage the flow of milk within the state to limit the need for and cost of hauling milk between plants, or to limit the portion of that cost that is borne by Producers.

In Montana, milk that is normally shipped to one plant, but is needed at a plant farther away, can be diverted and shipped directly to the more distant plant with the incremental shipping cost charged to the Pool. In other words, Producers pay for the portion that represents what it would cost to haul to the closer plant, but the additional hauling required to divert and ship milk to the more distant plant is shared by all of the Producers through the Pool. This is referred to as “inter-Plant” hauling.

The “inter-Plant” milk is typically not physically delivered to a Producer’s “home” plant and then reloaded and hauled to another Pool plant. It is nearly always shipped directly from a Producer to the intended Pool plant. A deduction that represents the cost if the milk had been delivered to the Producer’s home plant is made against the actual shipping cost and charged directly to the Producer as their “normal” delivery cost. The remainder is charged to the Pool and shared by all the Producers in the state as an inter-Plant hauling cost.

Nearly all inter-Plant milk is currently delivered to the Billings plant with an average of approximately 75% coming from Great Falls and 25% from Bozeman over the last three

calendar year period of 2015-2017, although Bozeman's share dropped to just under 15% in calendar 2017.

The volume of milk shipped to Billings over the last three calendar years has averaged a little over 28.6 million pounds per year and represents nearly 64% of the Billings plant's in-State utilization. This occurs because there is insufficient milk production the area of the State near Billings to meet its total utilization needs.

After researching most of the Order and non-Order areas of the country, we found that Montana is the only Order where the cost of transportation between plants is included in the Pool. The Southeast Order provides a limited subsidy for milk shipped in from out of the area during the low season, and some Orders allow Assembly and Transportation credits to Supply plants that divert milk to Class I plants. A Supply plant is generally a Balancing Plant that will "divert" milk to a Class I plant when the Class I plant needs it. This might occur on an occasional basis.

Throughout the rest of the country, Producers are responsible for just paying the direct cost of hauling their milk to their processing plant. It is rare for raw milk to be shipped from one plant to another plant. Exceptions occur when components like cream or whey may be sold or shipped to another plant for further processing but in general, Processors absorb the cost of such transport.

Most Producers in the country are members of a cooperative marketing organization (coop) that charge their individual member Producers the direct cost of hauling their milk to the closest plant serviced by the coop, regardless of where their milk is actually delivered. Any difference between what is paid by the individual Producer and the actual cost of hauling the milk to wherever the coop decides to process it is then shared by all the member Producers in the region.

Although this appears to be somewhat similar to Montana's pooling and sharing of inter-Plant hauling costs, it is different in the material respect that it is confined solely to the member Producers of the coop and is not pooled or shared by Producers of unrelated entities or plants across the state or region.

Larger, independent Producers generally pay the full amount of hauling to whatever plant their milk is shipped. On rare occasions, if there are no Producers near a plant, the plant may have to pay a premium to help cover the hauling cost to obtain raw milk.

Montana's practice of charging inter-Plant transport of milk to the Pool means that certain Producers, and to a certain extent, the receiving Processor, do not bear the full cost of having milk delivered to that Processor. Nearly 100% of inter-Plant raw milk is being delivered to the Billings plant from Meadow Gold's Great Falls and Darigold's Bozeman Producers. Including the hauling cost associated with inter-Plant transport in the Pool results in Darigold Producers

subsidizing a portion of the hauling cost that would otherwise be borne by the Meadow Gold Great Falls' independent Producers or possibly, to some extent, by Meadow Gold itself.

The total inter-Plant hauling cost in calendar 2017 was nearly $530,000 and Darigold's allocated share of this amount through the Pool, based on calendar 2017 utilization volumes, was about $295,000, versus $23,000 for the hauling cost of the milk it actually shipped to Billings, or there would be no cost if Billings paid the cost of the transfer.

The cost of hauling is an important factor when considering where to locate a new dairy farm (although few new dairies have been established recently in Montana). In general, sharing the delivery cost through the Pool lessens the pressure for new dairy farms to locate close to the plant, or to induce an existing farm located far from the plant to move closer in order to reduce their direct hauling costs. Once established, it is a difficult decision to move a farm just to get closer to a Processor, and it is not something that has occurred in Montana for a long time.

On the other hand, an argument has been put forth that subsidizing the cost of getting milk to the Billings' plant improves the volume of Class I milk that can be processed. If the cost wasn't subsidized by the Pool, the milk would not flow to the plant and Billings may either acquire additional Class I milk from out-of-State or possibly even shut down, so by providing more Montana milk to the plant to be used as Class I milk, the subsidy is increasing the value of all the Pooled milk. It is unclear if this argument is in fact correct, as it is also possible that the Billings volume could be provided from certain in-State Producers who were willing to absorb the cost to obtain a better price, or that Bozeman and Great Falls might absorb the in-State Class I milk currently being processed by Billings if the plant were to close.

Our considered recommendation is to eliminate charging the Pool for Inter-Plant hauling for several reasons. This practice appears to be unique to Montana. On a standalone basis it is not equitable to have costs incurred through activities of certain Producers subsidized by other Producers where they do not direct and equal value in return. This is especially true if the party incurring the cost is essentially a competitor of a party sharing in the cost.

This recommendation is made on a standalone basis. However, there are other changes we have recommended to the structures for the Quota and Pooling systems that would affect other factors that act as offsets to one another, including the inter-Plant hauling cost. Taken in concert, all the changes as recommended would act to offset some of the economic impact of eliminating this particular practice.

Alternatively, if the Pool is eliminated or separate Pools are established for individual Producer Groups or groups of Processors, then it would be up to the members of these separate Pools to decide to share inter-Plant hauling costs. In essence, the separate Pools would work in similar fashion to the way coops function in spreading hauling costs among members in the region.

4.d. Study Task 4 – The Montana Quota System

We evaluated the effectiveness of the Montana Quota system to manage production levels and improve Producer blend prices. In evaluating the Montana Quota system, we considered the following: potential impacts of changes to the Quota milk price, the Excess milk price Differential, changes to Quota rules that would make the system responsive to levels of milk processing within Montana, how to more closely match outstanding Quota with Montana market needs in the future, and finally, the impacts of transitioning the Quota system.

Many of the issues regarding the Montana Quota system also have an impact on the Montana Pool and so we evaluated the current Pool structure as well that resulted in identifying certain additional alternatives and recommendations.

4.d. i. Other States with Quota

Our research identified two states that have formal Quota systems: Virginia and California. In addition, although Pennsylvania does not have a statewide Quota system it does have some informal measures to manage production levels. A summary of each of these structures follows.

Virginia

Virginia has approximately 608 dairies and 90,000 cows (2016) although they lost a large dairy in November 2017. The Quota system in Virginia, which is referred to as Base, was established to provide stability and a fair price to Producers for fluid milk sold in Virginia. Virginia's Base (Quota) cannot exceed 108% of Class I fluid milk sold just in Virginia and is adjusted annually. Class I sales outside of Virginia are referred to as Class I-A.

Base can be and is held by out-of-State Producers as well as Virginia Producers. Approximately 55-60% of in-State Virginia Producers own Base, 284 Pennsylvania Producers own Base and Producers in nine other states own Base. Producers can transfer or sell Base and transfer are handled administratively by Virginia assuming all other requirements are met. All owners of Base are obligated to sell at least their level or have their Base reduced to their level of production.

The benefit of Base is that the Producer is paid the higher Virginia Class I price for all Base production. Virginia's pricing mechanisms result in prices greater than Federal Order for Class I. Any volume produced over Base is sold based on the applicable Federal Order classifications wherever the milk is sold.

Prices within Virginia are different based on where a Processor is located. Prices are tied to nearby contiguous areas including Washington, DC and certain locations in North Carolina to

keep pricing in check with surrounding markets. Pricing is also tied to a list of indices, but most have been maxed out and can no longer effectively increase prices.

Each year retail fluid milk sales in Virginia are examined and compared to the existing Base level. In February, the milk Board looks at the last calendar year and adjusts the Base. If Base exceeds retail sales, it must be reduced so as not to exceed 108% of those sales. If retail sales exceed Base, the Board has the option to increase Producer Base so long as it does not exceed 108%. The new Base takes effect March 1st of that year and all owners of Base are adjusted on a pro-rata basis.

The farm price is based on the FMMO Advanced Skim and Butterfat pricing. This is used along with numerous (8) other cost components to arrive at a Virginia based Producer Price. Class I is Fluid milk processed and sold in Virginia, and accounts for 87% of the milk. Class I-A is Fluid milk that is processed in Virginia by plants that sell milk in Virginia, but is sold out-of-State. This Class was developed to track the volume leaving Virginia and is priced at the Class I Federal Order of where it is sold. There is no minimum wholesale price for this Class. Class II is all other products.

Pricing from the plants to retailers or wholesalers is determined by the Milk Commission which audits plants and, using a weighted average, determines a minimum plant throughput cost. The weighted average is set for one year. To determine the wholesale price a percentage is added to the weighted average. To set a Retail price, 6% is added to the wholesale price

California

California has approximately 1,330 dairies with 1,735,350 cows (2017) both of which represent slight reductions from the prior year.

The Quota system in California was established in the late 1960's, based on total production and Class I utilization at the time, to create stability and equity in pricing for Producers. Its goal was not meant to manage or control production levels.

When first established, the initial asset value, in other words the value a farmer could receive for selling its assigned Quota to another party, was $0.00. The asset value of Issued Quota is market driven and is currently valued at about $530 per pound per day of SNF (Solids Not Fat). California Quota volume was originally set at 110% of its Class I fluid milk sales and a Pool was established to determine payments to Producers holding Quota.

Quota is currently a finite volume of milk as Class I consumption growth never materialized that would allow Quota to be increased. The last time any new Quota was issued was in 1992. Over the years Class I utilization has decreased as a percent of total production in the state. In 2017 California produced 39.8 billion pounds that was utilized as follows:

- 12.8% as Class I
- 5.5% as Class II

- 3.0% as Class III
- 32.5% as Class IVa
- 46.2% as Class IVb

Not all Producers hold Quota or are members of the Pool nor is there any requirement to do so. 57% of dairy Producers in the state hold Quota. Class I and II plants in California participate in the Pool but Class III and IV plants are not required to do so.

For a Class III or IV plant to participate in the Pool it must transfer some portion of its milk to a Class I plant. This may be done to keep Producers who hold Quota and are supplying that plant happy as they then can receive Quota milk pricing for that portion of their milk.

Quota may not be held by an out-of-State Producer. Producers can transfer or sell Quota. If a farm shuts down operation, it has 60 days to sell or transfer its Quota or the Quota reverts back to the Pool. The state has always worked to help its Producers sell their Quota and it is unknown whether there is any Quota held by the Pool.

New entrants to holding Quota and to the Pool must meet certain production requirements to obtain Quota. In addition, they must maintain their production level at the same or greater volume for 5 years to keep their Quota. Farms pay the cost from farm to plant and in some instances, the co-op covers the cost then deducts the cost from the farm. Any shipments or transfers between plants is paid by the shipping plant.

The benefit of holding Quota at present is that the Producer receives a premium of $1.70/cwt for all the milk it produces up to their Quota limit. Beyond the Quota limit, all milk sold by a Producer is based on California's Class pricing in the Pool along with all other Producers. The Base and Over Base Price is the same for Butterfat, but there is a premium on the Quota skim non-fat Solids (SNF). The premium for Quota milk is $0.195 per pound SNF for all the milk produced within Quota and is the same regardless of how a Producer's milk is utilized (Class 1, 2, 3, 4a, or 4b). The standard for testing of non-fat solids in milk is 8.7% which, when multiplied by the $0.195 premium per pound of SNF, equates to the $1.70 per cwt of skim milk. However, the Quota premium is paid at actual test. For example, if a Producer's milk tested at 9.1% SNF, the hundredweight Quota payment would be $1.77/cwt. (0.195/lb * 0.091 * 100lbs).

California's milk market program establishes minimum prices Processors must pay for Grade A milk received from dairy farms. The most significant factors in determining the minimum price Processors must pay for milk are the wholesale commercial market price for the four dairy product commodities as follows:

- The simple average spot price for Grade AA butter at the Chicago Mercantile Exchange (CME),
- The California weighted average price (CWAP) for nonfat dry milk (NFDM) as reported by the California Department of Food and Agriculture (Department),

- The simple average spot price for block Cheddar cheese at the Chicago Mercantile Exchange (CME), and
- The simple average of the price for Western dry whey (WDW) as reported by Dairy Market News (DMN)

The Pool is made up of Classes I, II, III, IVa & IVb prices (Class III ice cream, Class IVa Butter/powder, Class IVb hard cheese) and plants may have contracts with both co-ops & independent farmers supplying them raw milk.

A petition was submitted in California to establish a federal order for pricing and the USDA recently responded and announced the plan for implementing this. The USDA order structure has no provisions for Quota. Separately California has created a Quota implementation plan that would be automatically triggered if the USDA pricing plan is adopted and transition to the USDA plan will require a vote by the California Producers.

Pennsylvania

Pennsylvania has 6,650 dairies with 525,000 cows as of 2016. Pennsylvania does not have a formal state Quota system. However, some of the cooperatives have a Quota type system within their own membership. For example, Land O'Lakes has a Quota system with a stringent disincentive of $10/cwt for product sold over Quota. The plan states that "Under the program, members producing more than their base volume will be charged any incremental costs (freight, market discounts) associated with marketing that milk in less profitable channels".

A dealer and its Producers may establish a system of level or uniform milk production in accordance with the requirements of the dealer, and pursuant to the terms and conditions prescribed by the Board, if the milk dealer first shall make a formal application to the Board and receive written authorization to do so.

The PMMB (Pennsylvania Milk Marketing Board) establishes minimum Producer, Wholesale, and Retail prices. The minimum Producer price includes a Board-mandated over-order premium on Class I milk produced, processed, and sold in Pennsylvania.

There are 6 marketing areas in Pennsylvania. Three of the areas are in Federal Orders 1 or 33 (Areas 1, 4 & 5), and the PMMB uses the Blend or Uniform Price established in Federal Market Area 1 or 33 to compute the farmer's price.

In PMMB Areas 2, 3 & 6 (FMMO non-regulated areas) there are plant Pools established for computing a blend price. If the plant is a Class I plant and ships at least 25% of its product into a Federal Order area, then it will be Pooled in that Federal Order.

Fluid milk dealers may request an allowance on bulk sales of Surplus or distressed milk to other licensed dealers solely engaged in the manufacture of dairy products if the selling dealer

obtains written authorization in advance from the Board and provides the Board with information required on detailed forms.

When a dealer provides the service of transporting the Producer's milk from the Producer's farm to a dealer's plant of first receipt, the dealer may deduct from the payment to the Producer for such service based upon the dealer's actual cost of transportation, a record of which shall be kept by the dealer.

Monthly, the PMMB sets Minimum Wholesale prices based on an annual study of plant costs. The annual plant cost study collects and computes the average cost for milk plants to process, pack and deliver product. There are discounts which customers are entitled to off the Minimum Wholesale Price based on volume and services supplied.

The PMMB also sets Minimum Resale prices each month. These prices are determined by a formula based off the Minimum Wholesale Price, a survey of the in-store handling costs, an established profit, and a discount rate based off volume and services.

4.d. ii. Quota in Montana

The original purpose of Montana's Quota system was to help manage and provide stability to the level of milk production and to help create a sustainable price that Producers receive for milk sold within Quota. When there is too much milk being produced, Surplus milk is typically sold at distressed prices.

Since Montana Producers are paid based on the blended price of all milk sold as utilized, discounted Surplus milk brings down the blended price that all Producers receive. To avoid this, a Quota system would typically be based on actual demand for the higher-priced Class I milk so that the milk that is produced and sold within Quota would be at a higher price. Milk produced in Excess of the Class I demand is typically sold at a lower price in the market, and any Producer generating Excess milk would receive a separate lower price for the Excess production. This is meant to discourage Excess milk production in general, but also allows Producers who choose to produce Excess milk to do so and receive a lower price for it.

Excess milk, or milk produced above Quota volume, may still be needed to produce items other than Class I bottled milk. However, if there is more milk than the Processors need for bottling or manufacturing products, that milk is considered Surplus, and it is usually sold to a Balancing plant at a discount.

Montana's Quota system establishes a $1.50/cwt price Differential for Skim and Butterfat between Pool-wide blend prices for milk produced within a Producer's Quota and Pool-wide blend prices for milk produced in Excess of a Producer's Quota. The price Differential was created to discourage Producers from producing in excess of their Quota.

Daily Quota (in units of pounds of milk per day) was allocated in 1988 to Montana Producers based on their historic deliveries to fluid milk plants, although Quota itself is not tied to individual plants, but just to Producers. Quota may only be held by Montana Producers. Also, a Producer's Quota does not change if the Producer sells milk to a different plant in Montana.

Issued Quota can only be held by active dairies and cannot be leased, although it can be sold on an open market basis to any Producer. Producers can sell a portion of their Issued Quota to other Producers at any time, or all of their Quota as part of shutting down active operations. Any Quota that is offered for sale as part of a farm shutting down, but that is not sold within 90 days of the farm becoming deactivated, is then forfeited and reallocated on a pro-rata basis to all outstanding farmers. Reassignment of Quota is rare, since exiting Producers can find buyers of their held Quota from among active Producers.

The Milk Control Bureau is required to issue additional Quota to Producers in response to the occurrence of two market triggers that must both have taken effect. The first market trigger is that the utilization of milk for Class I and Class II (for sales of products to the Montana market) must have increased from two years prior to the preceding year. The second market trigger is when, in the preceding year, over 83.5% of Quota milk receipts are utilized for Class I and Class II sales of products to the Montana market.

In recent years, roughly 60% of Quota milk has been utilized in Class I and Class II sales of products to the Montana market. The last year that state-wide Quota was increased and allocated to Producers was 2001, which resulted from the market triggers occurring in 2000.

The administrative rules that govern Quota do not provide for any automatic reductions of Quota that might be based on such events as production history, Quota utilization, market triggers, or closure of dairies or plants. Administrative rules that govern Quota also do not provide for increasing Quota in response to demand created by Class III plants or demand for raw milk by plants for products marketed outside Montana.

Approximately one-third of Montana dairies currently produce milk in Excess of their Quota and last year this Excess production accounted for roughly 4% of statewide production. The remaining two-thirds of Montana dairies produced milk within their individual Quota volume, with nearly two-thirds of these dairies producing under their Quota volume by 10% or more. Collectively, the "underproduction" of Quota was over twice the Excess production over Quota.

As noted above, Quota volume significantly exceeds Class I utilization for Montana Processors, and in fact exceeds total annual production, meaning that Montana Producers are collectively producing less milk than allowed by Quota. In this situation Quota is not serving any purpose for which it was established.

Certain Producers do produce more milk annually than their Quota allows and receive $1.50/cwt less for this Excess volume of milk. However, all Producers in the state are negatively

affected by Excess production. Since Montana already is in a significant Surplus position, and the $1.50 difference between Quota and Excess is fixed, the Excess produced by Producers simply contributes more to the Bulk Surplus, which as noted in other Sections of this report, effectively lowers the blended Pool price that all Producers receive.

In order to understand the impact of the current Quota system and changes to Quota, we analyzed utilization by Processing plant. The following table shows utilization (pounds) by plant and by Class for Montana for calendar 2017.

	Production and Utilization of Montana Milk 2017 Pounds					
	Bozeman	Great Falls	Billings	MCE	Total	% of Total
Class I						
Within Montana	58,598,288	58,757,224	28,447,617	1,084,362	146,887,491	52.7%
Bulk Sales to Class I Processors	-	-	-	-	-	0.0%
Packaged Sale Contig	1,973,705	5,894,966	10,860,145	-	18,728,816	6.7%
Packaged Sales Non-Contig	69,819,376	-	-	-	69,819,376	25.0%
Total Class I	**130,391,369**	**64,652,190**	**39,307,762**	**1,084,362**	**235,435,683**	**84.4%**
Class II	1,801,700	5,602,721	3,869	336,493	7,744,783	2.8%
Class III						
Shrink, End Inv and Sales in Montana	3,441,880	2,702,263	3,727,653	78,394	9,950,190	3.6%
Allocated to Cream Sales	5,746,329	2,093,285	2,472,578	-	10,312,192	3.7%
Bulk Sales	9,341,669	6,116,268	-	-	15,457,937	5.5%
Total Class III	**18,529,878**	**10,911,816**	**6,200,231**	**78,394**	**35,720,319**	**12.8%**
Total Utilization of Montana Milk	**150,722,947**	**81,166,727**	**45,511,862**	**1,499,249**	**278,900,785**	**100.0%**
Total Montana Production	**154,958,712**	**105,922,001**	**16,520,823**	**1,499,249**	**278,900,785**	

The table shows that Class I utilization sold within Montana in calendar 2017 was nearly equal for Bozeman and Great Falls, while Billings utilized about half the volume. Altogether, Montana Class I utilization sold in Montana represented 52.7% of the total annual milk production in calendar 2017.

Surplus Packaged Sales account for 31.7% of the total annual milk production, with Bozeman accounting for 81% of that total. There is a detailed discussion of Surplus Packaged Sales in the Section 4.b. Study Task 2.

The Darigold and Meadow Gold Producer groups hold close to the same amount of Quota and this produces somewhat of a misalignment with regard to Class I fluid sales within the State. Darigold's Producers hold approximately 51.8% of total state-wide Quota but Darigold as a Processor serves 40% of the retail Class fluid milk sold in the State. On the other hand, Meadow Gold's Producers hold 47.9% of total state-wide Quota, but Meadow Gold itself serves 60% of the retail Class I fluid milk sold in the State.

The milk that MCE produces and utilizes in its own processing plant represents about 0.3% of total state-wide Quota but is utilized mostly for its own internal purposes. However, MCE also

acts as a Producer selling raw milk to Darigold and has significantly more Quota associated with that volume. In fiscal 2017, MCE produced Excess milk nearly 24% above its Quota.

Total state-wide Quota in Montana represents about double the in-State Class I demand in Montana and exceeded total Montana milk production in calendar 2017 by approximately 7%.

The Quota system in Montana is not working effectively and has had little impact on production or pricing as evidenced in a number of ways. Total annual production has varied somewhat over the last 15 years but has always been below state-wide Quota even though certain individual farmers produced well over their individual Quota. This means that the remaining farmers are collectively producing well below their Quota and that Quota in and of itself is not a driving factor in managing production volume. Also contributing to reduced production over the last several years has been a steady decline in the number of farms and total number of cows in Montana (see "Montana – Number of Cows and Dairies – Trend" in Appendix C). The market value of issued Quota as an asset, obtained through selling Quota when a Producer reduces herd or shuts down, has declined over the years.

Individual Producers cannot manage their own production level as a means of receiving a higher average milk price because total state-wide Quota exceeds total production and all Producers receive the same blended price through the Pool, adjusted for their Butterfat content. Any individual Producer who reduces production has minimal impact on the blended Pool price, and if another Producer increases production, it can effectively offset any impact.

Given these results, it's clear that established Quota volumes and the current Excess Differential of $1.50/cwt are having little if any effect in managing overall production in Montana or acting to raise or stabilize milk pricing for those Producers who might otherwise wish to manage (e.g., lower) their production to receive a higher price for their milk.

In 2015 – 2017 respectively, the usage value of the milk in Montana was $48.2 million, $43.6 million and $47.6 million, prior to inter-Plant hauling charges. This is $16.25, $14.77 and $16.49 per cwt, respectively, at a standard of 3.5% Butterfat. Actual Butterfat content is typically higher than 3.5% and varies by Producer and in total for the Pool, as well as by utilization and period. We used the common standard of 3.5% to simplify our analysis and provide a consistent basis for comparing periods and utilizations. The following table shows the usage values of the milk in Montana for 2017 broken down by plant and disposition.

	Utilization Value of Montana Milk 2017 before additional charges				
	Bozeman	Great Falls	Billings	MCE	Total
Class I within Montana					
Montana Value	$8,927,983	$8,735,449	$4,354,815	$118,063	$22,136,308
Beg Bulk Inv Adj	$9,648	$0	$117,841	$0	$127,489
Total Montana Class I	**$8,937,630**	**$8,735,449**	**$4,472,656**	**$118,063**	**$22,263,798**
Value per CWT	**$15.25**	**$14.87**	**$15.72**	**$10.89**	**$15.16**
Value per CWT at 3.5% BF	**$19.03**	**$19.02**	**$19.44**	**$18.93**	**$19.11**
Packaged Sales to Contiguous States					
Montana Value	$277,651	$909,362	$1,629,084	$0	$2,816,097
Adjustment	($50,329)	($150,322)	($276,934)	$0	($477,585)
Total Montana Packaged to Contig	**$227,321**	**$759,041**	**$1,352,151**	**$0**	**$2,338,513**
Value per CWT	**$11.52**	**$12.88**	**$12.45**	**$0.00**	**$12.49**
Value per CWT at 3.5% BF	**$16.51**	**$16.51**	**$16.52**	**$0.00**	**$16.52**
Packaged Sales to Non- Contiguous State					
Montana Value	$10,417,903	$0	$0	$0	$10,417,903
Adjustment	($2,129,491)	$0	$0	$0	($2,129,491)
Total Montana Packaged to Non-Contig	**$8,288,412**	**$0**	**$0**	**$0**	**$8,288,412**
Value per CWT	**$11.87**				**$11.87**
Value per CWT at 3.5% BF	**$16.01**				**$16.01**
Class II					
Montana Value	$827,737	$2,029,891	$11,027	$90,031	$2,958,686
Beg Bulk Inv Adj	$3,141	$4,279	$44	$9,210	$16,674
Total Montana Class II	**$830,878**	**$2,034,170**	**$11,071**	**$99,241**	**$2,975,360**
Value per CWT	**$46.12**	**$36.31**	**$286.14**	**$29.49**	**$38.42**
Value per CWT at 3.5% BF	**$15.73**	**$15.57**		**$16.57**	**$15.64**
Class III					
Cream, Shrink and End Inv.	$5,465,144	$2,095,176	$2,146,314	$46,031	$9,752,665
Beg Bulk Inv Adj	($5,966)	($4,877)	($1,998)	$0	($12,840)
Total Class III	**$5,459,178**	**$2,090,300**	**$2,144,316**	**$46,031**	**$9,739,825**
Value per CWT	**$59.42**	**$43.59**	**$34.58**	**$58.72**	**$48.07**
Value per CWT at 3.5% BF	**$12.86**	**$12.71**	**$12.92**	**$12.91**	**$12.84**
Bulk Sales to Class III Processors					
Montana Value	$1,256,861	$808,474	$0	$0	$2,065,335
Adjustment	$236,219	$80,965	$0	$0	$317,184
Haul Charges	($205,517)	($210,326)	$0	$0	($415,843)
Total Class III	**$1,287,564**	**$679,112**	**$0**	**$0**	**$1,966,676**
Value per CWT	**$13.78**	**$11.10**	**$0.00**	**$0.00**	**$12.72**
Value per CWT at 3.5% BF	**$13.30**	**$10.82**	**$0.00**	**$0.00**	**$12.20**
Total Processor Utilization Value	**$25,030,983**	**$14,298,071**	**$7,980,194**	**$263,335**	**$47,572,583**
Value per CWT	**$16.61**	**$17.62**	**$17.53**	**$17.56**	**$17.06**
Value per CWT at 3.5% BF	**$16.01**	**$17.05**	**$17.03**	**$17.61**	**$16.49**
Inter-Plant Hauling Charges	($23,018)	($503,576)	$0	$0	($526,595)
Value of Transferred Milk	$754,241	$4,309,886	($5,064,127)	$0	$0
Net Utilization Value	$25,762,206	$18,104,381	$2,916,066	$263,335	$47,045,988
Value per CWT	**$16.63**	**$17.09**	**$17.65**	**$17.56**	**$16.87**
Value per CWT at 3.5% BF	**$16.02**	**$16.57**	**$17.03**	**$17.61**	**$16.30**

Before adjustments related to inter-Plant hauling charges, the average price received by Producers in calendar 2017 was $17.06/cwt, or $16.49/cwt at a standard 3.5% Butterfat.

Given that the current Excess discount is $1.50, and the total amount of Excess in fiscal 2017 represented about 4.0% of production, the Quota milk price was $16.55, and the Excess price was $15.05 at 3.5% Butterfat (before inter-Plant hauling charges).

We adjusted the actual data per cwt to 3.5% butterfat so that the results can be more easily compared and because just looking at actual data can be a little misleading. For example, the value of Class I milk utilized for sale in Montana in calendar 2017 was $15.16/cwt. This may seem low if compared to the published average Class I value in other states or areas of the country. However, the average butterfat content of the milk sold as Montana Class I is just under 2%, so the value of $15.16/cwt is for milk at just under 2% butterfat. If the value is adjusted to the "standard" butterfat of 3.5%, the result is $19.11/cwt, which can be compared to the published standard Class I price in other jurisdictions. Similarly, Class II volume sold in Montana is mostly cream, with an average butterfat content of around 13% and a value of $38.42/cwt. This value varies significantly based on the type of cream sold (8% butterfat for half and half to 40% butterfat for heavy cream), so to get a better idea of comparable Class II prices, we used the standard of 3.5% Butterfat, which results in a Class II value of $15.64.

4.d. iii. Options for Setting the Amount of Quota Going Forward

Since the current Quota system in Montana is not creating an incentive to reduce Surplus milk in the state, we believe that the system should be modified. We identified three options for addressing Quota going forward.

1. **Quota Option 1:** Our recommendation is to reduce state-wide Quota to where it has meaningful impact on individual Producer decision making.

   For Montana, the most logical level appears to be at or slightly above the volume of raw milk required to meet the Montana Class I demand. Class I is the core of dairy products processed and sold in Montana and essentially represents the floor of required production volume. However, if the goal is to assure that the state-wide Quota volume is sufficient to cover Class I sales, then at least two other elements need to be considered: Cream and Shrink.

   Raw milk averages about 3.7% butterfat. Packaged Class I milk currently contains an average of about 2% butterfat, leaving about 1.7% to be utilized for cream. Since bulk cream is sold at 40% Butterfat, every 100 pounds of raw milk generates approximately 4.5 pounds of cream.

   All Processing plants have shrink or product losses. By rule in Montana, no more than 2% of total milk processed can be classified as shrink and priced as Class III milk. Something similar to this exists in most regulated markets. So, for every 100 pounds of milk processed, 2 pounds of shrink are allowed to be costed at the Class III price, assuming actual shrink is at least 2%. Any shrink above 2% is priced as Class I

Thus, cream and shrink represent approximately 6.5%, or 6.5 pounds out of every cwt processed, and are priced as Class III milk. Therefore, to ensure that enough milk is produced, it seems logical to include this additional 6.5 pounds of Class III as part of Quota. Rounding up, Quota established to ensure sufficient supply is produced to meet Class I demand needs to be set at a minimum of approximately 107% of Montana Class I Usage.

Setting Quota close to actual Class I demand results in providing a significantly higher milk price for Quota volume than for Excess. Producers will receive essentially the Class I milk price for the volume they produce within their Quota, and this should put them in a healthy financial situation.

As discussed later, larger farms likely will be happy to produce Excess milk for a lower price if a portion of their milk is Quota milk and paid at a good price. This means that Quota volume could be set at close to the Class I demand and any Excess milk needed would still be available since it likely will be priced at Class III or better.

2. **Quota Option 2:** The second option is to leave the state-wide volume of Quota where it is but increase the discount significantly above the current $1.50 to provide a strong, even uneconomic, disincentive for producing Excess.

   In calendar 2017, a little over 10.5 million pounds of Excess milk was produced state-wide. This Excess volume was equivalent to just under half the average annual bulk sales for the period calendar 2015-2017, and approximately 68% of calendar 2017.

   If Excess production in calendar 2017 had been reduced by this 10.5 million pounds, the result likely would have been a reduction in Bulk Surplus Sales by an equivalent amount, resulting in an increase in the overall Pool value of $0.25/cwt, from $16.49/cwt to $16.74/cwt in the net blended price, at a standard 3.5% butterfat.

   However, Producers who do not currently produce at their allowed Quota could in turn simply increase their own production and make up the difference without exceeding total state-wide Quota. Thus, simply increasing the Excess Differential would not necessarily have any impact on total production volume.

   Bulk milk sales decreased from 27 million pounds in calendar 2015 to 15.5 million pounds in 2017 with no changes to the Quota or Pool systems. Darigold's decrease in bulk sales was offset somewhat by an increase in its packaged sales out-of-State, but Meadow Gold's reduction in bulk sales represented a real decline.

3. **Quota Option 3:** The third option is to eliminate the Quota system entirely.

   Elimination of the Quota system could be accomplished either on a standalone basis or in line with changes in how Classifications of milk are priced, changes to the Pool system, or changes made along with other mechanisms that may be set in place.

   Quota system elimination must take into account that many Producers use the value of their Issued Quota asset as collateral for bank loans. Eliminating the Quota system would obviously eliminate its associated asset value in the market and as loan collateral and some mechanism would need to be established to address this consequence.

   In addition, Issued Quota asset value is a consideration that farmers take into account when deciding whether to reduce or sell their herd and loss of that value would have a significant financial impact in such decisions.

   However, absent the two issues discussed above, Quota as a system, and the Excess discount, currently appear to have little or no effect on managing production, making the Quota system ineffectual in that regard. An outcome of this can also be seen in the declining market value of Issued Quota as an asset.

4.d. iv. Effect of Reducing Quota Volume to a Level Based on Class I Demand

If Quota during calendar 2017 had been set at the Montana Class I utilization, the Quota milk price would have been approximately $18.67 per cwt (at a standard of 3.5% Butterfat) and the blended milk price for all other volume over Quota (Excess) would have been $13.31 per cwt. This assumes Quota volume was set at 107% of Class I demand, and the payment for Quota was based on Class I and Class III pricing. Various options for pricing Quota volume are discussed in Section 4.d.v.

This Differential between Quota and Excess milk prices of $5.36 ($18.67 - $13.31) is substantially greater than the current Excess Differential of $1.50. This natural pricing differential would essentially eliminate the need for the fixed Excess Differential of $1.50 although a minimum fixed Differential could still be kept in place.

With a lower Quota volume tied to a higher price, Producers would receive the higher price for all production up to their Quota volume. If they decide to produce additional volume, it would then be at the lower Excess price. As volume declines, the result would be a higher net blended price at a lower volume. Under the current Quota and Pool structures this is essentially not an option for individual Producers, as has been discussed.

The long-term effect of this approach would likely be to lower overall production over time. This would have an expected subsequent effect of raising the overall average price Producers receive for any Excess (Quota milk price would be tied to Class I sales). This assumes that the

lowest value of milk, out-of-State bulk sales, would be reduced first. In any case, Producers would now have options and greater choice in deciding what level of production they wish to pursue.

It is also expected that the asset value for a pound of Issued Quota held, if sold on the open market, would increase so that the net cumulative asset value of all Producers' Quota would not change significantly, and may even increase. In other words, we expect that the asset value of Quota on the open market would increase, such that the lower amount of Issued Quota times a higher market value would equal or exceed the value of currently Issued Quota at its current market value.

Consideration of what level to set state-wide Quota volume raises the issue of what level of production would be optimal for the industry as well as whether, to what extent, and how quickly a decline in production levels should be incentivized. Setting Quota volume to approximate Class I demand should act to lower production. At lower production levels, the net average price paid to Producers will be higher. For most Producers, the higher price paid, even at the lower volume, should put them in a better financial position. However, some very small Producers may initially have difficulty reducing volume and remaining viable. These Producers would potentially need to acquire additional Quota, or close operations, if their lower Quota production volumes, even at a higher price, proved insufficient to maintain their dairy operation.

If total volume declined too much, it is possible that there may not be sufficient milk to cover the current level of Surplus Packaged Milk sales. However, considering the fact that the discount for Surplus Packaged Milk puts the price at about the Class III price, it is likely that Producers would provide Excess milk at that price.

The volume of milk sold as Class III Bulk milk out-of-State during the calendar period 2015-2017 declined by over 11.5 million pounds, offset somewhat by an increase in Class I Packaged Sales out-of-State of over 6.5 million pounds. The net drop in Bulk Sales seems to indicate that it is of insufficient value, but that Class I Packaged Sales out-of-State have sufficient economic value on an incremental cost basis (see Incremental Cost discussion Section 4.d.ix). The net result of this perception may be that farms do not see economic value in purchasing cows, especially from farms exiting the business, to produce milk that will be sold as Class III Bulk Surplus and this has resulted in a state-wide drop in the total number of cows and lower total production.

It is unclear how the Processors would respond to a reduced amount of Issued Quota. Darigold, as a cooperative, has specific obligations to its Producers whereas Meadow Gold, operating as an independent facility with independent Producers, has no formal obligation to its Producers. Milk currently being sold as Class III Bulk Surplus generates no value to Processors, they sell it primarily to support their Producers at what is believed to be no profit or loss to themselves. If there is significant production in excess of Quota volumes, would the Processors continue to do

their best to dispose of the milk, or would they simply stop receiving milk from certain Producers?

For example, the new Walmart plant at least partially caused a decrease in the demand for Class I milk in parts of the Midwest. As a result, a number of large independent Producers have been notified that their contracts will not be renewed, and they are not sure where they will be able to sell their milk.

One question that would need to be addressed if the level and rules for Issued Quota is changed is whether Quota should be set simply as a limit or established as a requirement. In other words, should Producers be required to produce at their Quota or lose it? This may not be an issue if Issued Quota is set close to Class I demand since most Producers would likely produce all of their Quota volume and also additional milk for a reasonable Excess price.

Satisfaction of Quota volume is calculated on a monthly basis. Given this, a rule requiring a Producer to relinquish part of their Issued Quota, in the event they did not produce enough milk to meet their Quota, might ordinarily consider whether a Producer met their Quota on a monthly basis and the number of months this occurred. However, since Issued Quota has an asset value that would be lost if a Producer was required to relinquish a portion of its Quota, it makes sense to address the issue over a longer time period. Our suggestion therefore is that Producers would relinquish Quota only to the extent that their total annual production did not meet their Issued Quota volume also calculated on an annual basis.

There should be a mechanism to periodically evaluate and re-establish the total volume of state-wide Issued Quota, either to increase it or to decrease it. The amount of Issued Quota allocated to each Producer should be recalculated and reassigned annually as part of any state-wide Quota adjustment.

If the Quota volume is established at a level equal to about 107% of Montana Class I sales, the associated issue that must be addressed is how the reduction should be implemented to be effective and equitable to all parties. Existing Issued Quota has an asset value in and of itself that can be sold on the open market and is used as collateral for bank loans. Any change to Quota needs to ensure that the current open-market asset value is not affected detrimentally in the short term but is allowed to find its market-based level over time.

Reducing all Producer's Issued Quota on a pro-rata basis appears to be the simplest and most equitable approach. Although many Producers have historically produced over or under their Quota volume to varying extents, the amount of Issued Quota itself has not been much of a driving factor, as discussed elsewhere, so the actual reasons why any particular Producer chose to produce at a certain level are unknown. A pro-rata reduction maintains each Producer's relative share of state-wide Issued Quota and their relative position with regard to the asset value of their Issued Quota. Incorporating actual production levels or other factors into how

Issued Quota is adjusted for each Producer would by their nature introduce some level of unknown and potential unfairness into the process.

Once the adjustment has been made, Producers would then have a stable basis for managing their production in regard to their Quota and over time can make clear decisions as to their level of production and whether to sell or purchase Quota.

This approach would not immediately resolve a misalignment in Quota that would be created between Producers and Processors related to Class I sales within the State. As discussed earlier, Meadow Gold Producers would not collectively hold enough Quota to satisfy Meadow Gold's share of Class I milk in Montana, while Darigold Producers collectively hold more Quota than needed to meet Bozeman's Class I Montana market share. The difference between the two was approximately 28 million pounds in calendar 2017. This is a little over 8% of the current state-wide Quota volume, and almost 20% of the actual Class I utilization.

Adjusting Quota downward is not expected to have an immediate effect on production, which likely will evolve over time. We believe that this process of evolution, an open market, and improved asset value for Issued Quota, likely will provide the basis for the near-term misalignment to work itself out.

In the event the Quota mismatch does not resolve itself satisfactorily, the Board of Milk Control could take further action, as appropriate, to facilitate bringing Issued Quota and Processor Class I volumes in line. We believe the overall adjustment to lower Issued Quota to 107% of Class I sales could be implemented in a single move assuming that sufficient notice is given and there is adequate opportunity for public review and comment. This proposed adjustment to Issued Quota could be implemented regardless of any other changes that are made to Montana regulations as a result of this study.

Establishing Issued Quota at 107% of Montana Class I sales should result in Quota milk being priced close to the Class I price. Assuming this is true, a subsequent question arises as to whether the Montana Class I Differential could be adjusted. Since Producers, especially those who keep within Quota, would receive a substantially higher price for their milk than they do currently, it may be an opportunity to lower the Montana Class I Differential somewhat to support Montana's competitiveness.

Only Cream Sales and Shrink associated with the Class I sales were considered in calculating the Quota level at 107% of Class I sales. Including Class II in-State sales in setting Quota could be considered as well, although that would potentially reduce the asset value of Quota by reducing the milk price paid per cwt. Class II volume was 5.27% of Montana Class I volume in calendar 2017.

4.d. v. Options for Pricing Quota Milk

There are a number of ways that Quota and Excess volume can be priced. Our recommendation is to use Quota Pricing Option 1 as described below, which assigns Quota milk the highest values of utilization without distorting the utilization of the various classes of milk. However, we believe this should be implemented under the Cascading Tiered Pricing method discussed in Section 4.d.vii which follows.

1. **Quota Pricing Option 1:** The first option would be to have Quota milk priced on a Pooled basis using the Class I price for Class I volume, and then any additional volume needed to meet Quota starting with the volume with the next highest value.

   If Quota volume is less than or equal to Class I utilization volume, then the calculation is simple, and the Quota milk price is Class I. If Quota volume exceeds Class I utilization volume, then the volume of the next highest value (generally Class II) needed to make up the difference, would be Pooled with the Class I volume and that Pooled average would be the milk price for the Quota volume. If the Quota volume was greater than the volume of Class I and Class II combined, then volume from the next highest level would be added, and so forth.

   This approach is similar to the Cascading Tier method example described in Section 4.d.vii. The major difference is that the Cascading Tier method allocates the various utilizations of Excess, while this option has a single blended value for all Excess volume.

2. **Quota Pricing Option 2:** A second option is that Quota milk is always priced at Class I.

   By setting the price for Quota milk at the Class I price, the price for the produced volume of Quota milk is maximized for the Producers with Issued Quota. In addition, the spread between Quota and Excess milk prices is maximized.

   If actual Class I utilization is less than the Quota volume, then the additional Class I milk price is pulled from the Pool of Excess utilization value, and the Excess milk price would be lowered somewhat.

   As long as Quota volume is close to Class I volume, then Excess utilization value will not be affected very much. But if Class I utilization became significantly less than Quota volume, then the utilization value of Excess could be reduced significantly.

3. **Quota Pricing Option 3:** The third option would be to price Quota milk at the Class I price plus the utilization value of the associated Class III cream and shrink.

As discussed elsewhere, for every hundred pounds of Class I milk bottled, about 4.5 pounds of cream are generated, and typically there is 2% shrink, and both are assigned to Class III. Since this 6.5 pounds per cwt of Class III milk are a natural part of Class I bottling, it seems logical to blend the value together with the Class I sales to calculate the milk price of Quota.

The result is that the blended price for Quota milk volume would be approximately 100 pounds of Class I and 6.5 pounds of Class III. These percentages could be kept, even if Class I usage was significantly different from Quota, but the calculations for Excess are a little more complicated.

4.d.vi. Pricing Excess Volume

Once the Quota Volume is priced, there still remains the question of how to price the Excess Volume. The current method is to simply create a difference of $1.50 per cwt between the price for the Quota and the Excess Volume. Assuming that the Quota Volume is reduced to close to Class I volume, there needs to be a significant disincentive to producing substantially more than the Quota Volume. To truly discourage production of Excess volume, we believe the difference between the price for Quota and Excess Volume should be approximately $5.00 per cwt. As discussed elsewhere, if the value of the Class I demand and the value of all other usage is calculated for calendar 2017, the difference is approximately $5.00 per cwt. However, not all Excess needs to be discouraged. In fact, only the excess that is truly Surplus to the needs of the Montana Processors should be discouraged. Class II, Montana Class III, and cream are "Excess" volumes that are needed and should be priced accordingly. Therefore, we recommend that instead of a single price for Excess Volume, a pricing mechanism similar to the Cascading Tired Pricing discussed in the next section should be implemented.

4.d.vii. Cascading Tiered Pricing

The mechanism used to price Quota and to allocate Excess utilization value can be structured in different ways. The milk price for Excess, defined as any milk produced above Quota volume, should be determined by the utilization of the Excess volume. In general, we believe the most equitable method is to assign the value of the Excess among the Producers who produce the Excess volume, but not to Producers who stay within their Quota, and it should flow to individual Producers based on the volume of Excess they produce relative to their Quota production.

An approach that addresses both Quota and certain Pooling considerations would be to create a "cascading" tiered structure for pricing whereby Producers generating Excess volumes would absorb a share of each descending tiered class of pricing (Class I, II, III and Surplus) based on the volume of Excess production they generate relative to their Quota production. At each tier, the allocation of value would be based on the pro-rata share of Quota owned by just those Producers whose un-utilized Excess production falls into that tier.

This approach would define the price that each Producer receives for their milk based on each Class that a Producer's Excess production cascades into, rather than a single "Pooled" price for all Excess. The current single Pooled price for Excess does not consider the volume of Excess a Producer generates relative to that Producer's Quota production. Producers who generate a higher percentage of Excess production relative to their Quota production would realize a greater share of the lower value tiers of utilization.

The value realized by the volume in each tier would be the actual utilization value of each Class of milk. However, the value of the first tier (Class I or Quota volume) could be structured using any of the methods described in Section 4.d.v. In the following example, we use Quota Option 1 as described in Section 4.d.v.

The approach for tiered pricing would work as follows:

- The first tier, Class I, would be allocated on a pro-rata basis to all Producers based on the amount of Quota volume they hold
- If the amount of Quota volume produced is greater than Class I utilization, then the remaining Quota would be allocated in the Class II tier first
- Excess milk would then be allocated by tier until it has all been valued. Each lower value "tier" of utilization would be allocated only to those Producers who generate sufficient Excess to fall into that tier
- The allocation in each tier would be the calculated pro-rata share of each Producer based on their Quota volume compared to the total Quota volume of just those Producers falling to that tier
- The lowest value of utilization (Bulk Surplus) would be absorbed by those Producers with the largest Excess in relation to their Quota volume

This approach maximizes the return to those Producers who have a greater share of state-wide Quota and minimize their percentage of Excess production, while Producers who generate the highest percentage of Excess production relative to their Quota production will receive the lowest blended price.

This approach can work regardless of how the Pool is structured. However, the Excess milk price paid to the Producers would depend on which Pool they deliver to if the Pool is no longer state-wide.

The following examples describe scenarios of how Cascading Tiered pricing could work.

Scenario 1 assumes there are 8 Producers who hold Quota. Producers 5, 6 and 7 have total production equal to their Quota, Producers 1, 2, 3, 4 and 8 have Excess production.

Scenario 1:	Allocation Based on Quota									Quota Volume of Producers in Each Tier
		Producer								
		1	2	3	4	5	6	7	8	
Quota	Total Owned	200	100	150	250	50	50	75	125	1,000
Percent Share of Quota for Each Tier	Class I	20.0%	10.0%	15.0%	25.0%	5.0%	5.0%	7.5%	12.5%	
	Class II	24%	12%	18%	30%				15%	825
	Class III	29%	14%	21%	36%					700
	Bulk	44.4%	22.2%	33.3%						450
Total Production		300	150	300	350	50	50	75	150	
	As % of Quota	150%	150%	200%	140%	100%	100%	100%	120%	
Class Utilization		Allocation of Utilization								
Class I	1,000	200	100	150	250	50	50	75	125	
Class II	165	40	20	30	50				25	
Class III	170	53	27	40	50					
Bulk	90	7	3	80	0					
Total	1,425	300	150	300	350	50	50	75	150	
Price per cwt		Allocation of Utilization Value								
Class I	$ 18.00	$3,600	$1,800	$2,700	$4,500	$ 900	$ 900	$ 1,350	$2,250	
Class II	$ 16.00	$ 640	$ 320	$ 480	$ 800	$ -	$ -	$ -	$ 400	
Class III	$ 14.00	$ 747	$ 373	$ 560	$ 700	$ -	$ -	$ -	$ -	
Bulk	$ 12.00	$ 80	$ 40	$ 960	$ -	$ -	$ -	$ -	$ -	
Total Utilization Value		$5,067	$2,533	$4,700	$6,000	$ 900	$ 900	$ 1,350	$2,650	
Utilization Value per cwt		$16.89	$16.89	$15.67	$17.14	$18.00	$18.00	$18.00	$17.67	

In this example Quota volume is equal to Class I sales, each Producer is assigned their Quota proportion of Class I sales, and all the Class I volume is assigned. Producers 5, 6, and 7 have no Excess production beyond their Quota so they are paid at the Class I price ($18.00 per cwt) for their milk and do not participate in any lower tiers, whereas the other Producers (1,2,3,4 and 8) do.

The next highest tier in utilization value is Class II, which is allotted to those Producers (1,2,3,4 and 8) who fall into that tier. Each Producer's share of the 165 pounds utilized in the Class II tier is calculated on a pro-rata basis with the numerator equal to the individual Producer's Quota and the divisor equal to the cumulative Quota of just those Producers falling into that tier, in this case 825 pounds (Quota of Producers 1-4 and 8).

Producer 8's pro-rata share of the Class II tier is 15.1% (125 lbs divided by 825 lbs), that when applied to the 165-pound utilization in the Class II tier, utilizes all of the dairy's Excess of 25 pounds. This results in a blended price of $17.67 per cwt for Producer 8 calculated as follows:

- 125 Quota lbs times $18.00 Class I price, plus 25 Excess lbs times $16.00 Class II price
- The resulting sum of $2,650 utilization value divided by total production of 150 lbs equals $17.67

The other Producers' Excess allotment is calculated in the same way. This allows them to utilize a portion of their Excess, but not all, so their remaining Excess falls into the Class III tier and so forth, where each successive lower valued tier is calculated in the same way. Producer 4 has no remaining Excess after the Class III tier so just Producers 1, 2, and 3 participate in the lowest tier, Bulk Sales.

The three Producers who produced only Quota are paid the Class I value. All the other Producers are paid slightly different (lower) values depending on how much of each of the lower value tiers their Excess production fell into.

Producer 3 realizes the lowest blended price because that dairy had the highest level of Excess in relation to Quota and that caused it to fall into the lowest tier and be allotted the greatest share of that tier.

In Scenario,2 we assumed that Producer 5 shuts down and the Quota is sold to Producer 2, but not the cows:

Scenario 2:	Producer 5 shuts down and Sells Quota to Producer 2, but not cows									Quota Volume of Producers in Each Tier
		Producer								
		1	2	3	4	5	6	7	8	
Quota	Total Owned	200	150	150	250		50	75	125	1000
Percent Share of Quota for Each Tier	Class I	20.0%	15.0%	15.0%	25.0%		5.0%	7.5%	12.5%	
	Class II	27.6%		20.7%	34.5%				17.2%	725
	Class III	33.3%		25.0%	41.7%					600
	Bulk			100.0%						150
Total Production		300	150	300	350		50	75	150	
	As % of Quota	150%	100%	200%	140%		100%	100%	120%	
Class Utilization		Allocation of Utilization								
Class I	1,000	200	150	150	250		50	75	125	
Class II	165	47		35	58				25	
Class III	170	53		75	42					
Bulk	40			40						
Total	1,375	300	150	300	350		50	75	150	
Price per cwt		Allocation of Utilization Value								
Class I	$ 18.00	$3,600	$2,700	$2,700	$4,500		$ 900	$ 1,350	$2,250	
Class II	$ 16.00	$ 747	$ -	$ 560	$ 933		$ -	$ -	$ 400	
Class III	$ 14.00	$ 747	$ -	$1,050	$ 583		$ -	$ -	$ -	
Bulk	$ 12.00	$ -	$ -	$ 480	$ -		$ -	$ -	$ -	
Total Utilization Value		$5,093	$2,700	$4,790	$6,017		$ 900	$ 1,350	$2,650	
Utilization Value per cwt		$16.98	$18.00	$15.97	$17.19		$18.00	$18.00	$17.67	
Total Value in Scenario 1		$5,067	$2,533	$4,700	$6,000	$ 900	$ 900	$ 1,350	$2,650	
Change in Total Value		$ 27	$ 167	$ 90	$ 17	$ (900)	$ -	$ -	$ -	

Now, since Producer 2 has sufficient Quota to cover all the production, that dairy receives the Class I price for all of the production. The value of all the other Producers with Excess changes slightly, and most improve because there is less overall production and the Excess volume that falls into the lowest value tier decreases accordingly. This demonstrates how the value per cwt improves from decreased production.

In Scenario 3 we assumed that Producer 5 shuts down but sells both Quota and cows to Producer 2:

Scenario 3:	Producer 5 Shuts Down and sells Quota and Cows to Producer 2									Quota Volume of Producers in Each Tier
		Producer								
		1	2	3	4	5	6	7	8	
Quota	Total Owned	200	150	150	250		50	75	125	1000
Percent Share of Quota for Each Tier	Class I	20.0%	15.0%	15.0%	25.0%		5.0%	7.5%	12.5%	
	Class II	22.9%	11.4%	17.1%	28.6%				14.3%	875
	Class III	26.7%	20.0%	20.0%	33.3%					750
	Bulk	57.1%		42.9%						350
Total Production		300	200	300	350		50	75	150	
	% of Quota	150%	133%	200%	140%		100%	100%	120%	
Class Utilization		Allocation of Utilization								
Class I	1,000	200	150	150	250		50	75	125	
Class II	165	37	28	28	47				25	
Class III	170	54	22	41	53					
Bulk	90	9		81						
Total	1,425	300	200	300	350		50	75	150	
Price per cwt		Allocation of Utilization Value								
Class I	$ 18.00	$3,600	$2,700	$2,700	$4,500		$ 900	$ 1,350	$2,250	
Class II	$ 16.00	$ 597	$ 448	$ 448	$ 747		$ -	$ -	$ 400	
Class III	$ 14.00	$ 757	$ 308	$ 568	$ 747		$ -	$ -	$ -	
Bulk	$ 12.00	$ 103	$ -	$ 977	$ -		$ -	$ -	$ -	
Total Utilization Value		$5,058	$3,456	$4,693	$5,993		$ 900	$ 1,350	$2,650	
Utilization Value per cwt		$16.86	$17.28	$15.64	$17.12		$18.00	$18.00	$17.67	
Total Value in Scenario 1		$5,067	$2,533	$4,700	$6,000	$ 900	$ 900	$ 1,350	$2,650	
Change in Total Value		$ (9)	$ 923	$ (7)	$ (7)	$ (900)	$ -	$ -	$ -	

Under this scenario Producer 2 continues to still have Excess, but not enough to fall into the lowest tier. Since the total volume did not change, the amounts of the various tiers do not change either. However, since Producer 2 has more Quota, and a lower percentage of the total production volume is Excess, the production stays within the higher value tiers, and the total value received by Producer 2 increases while the other Producers see their total values decrease slightly.

The above examples are relatively simple and for illustrative purposes only. The actual implementation would require two different sets of calculations, one for skim and one for butterfat. However, each would work in the same way as described above.

We believe this approach best supports reducing state-wide Quota volume, as recommended, to Class I sales levels and subsequently encourages the purchase of Issued Quota by individual

farmers, as needed, that in turn supports an increase and stabilization of the asset value of Issued Quota.

4.d. viii. The Pool Structure

All the raw milk produced in Montana is sold to Processors in Montana or in nearby states. In Montana the value of the milk is determined by its final use. Simply stated, all the revenue associated with all milk sales is put into a Pool, and the resulting total revenue is divided by the total cwt of milk sold to determine the Pooled value per cwt. Adjustments are made to the Pool for various costs including inter-Plant Hauling, out-of-State bulk milk sales and hauling, administrative costs and other fees.

Some of the cost components charged to the Pool are incurred by activities of just some Producers or Processors in certain cases, and all participants in other cases, but the effect is shared by all Producers. The result, in certain cases, is that certain sub-groups of Producers may be subsidizing the activities of other sub-groups. Some of these subsidies work to offset one another but across the board the impact tends to lean more on the side of either the Darigold or Meadow Gold "systems" on an annualized basis and Pooling, by its nature, tends to obscure certain inefficiencies or opportunities for improvement.

We analyzed Pool results over the last three calendar years to determine the impact of these components by Processing plant and its related Producers to understand the scope and impact of these factors. This included analysis of the difference between the net blended price that was paid to all Producers as a result of the state-wide Pool, and what prices would have been paid to Producers had the Pool been subdivided by processing plant and Processor organization (essentially Darigold and Meadow Gold).

Some of the specific components included in this analysis included:

- Impact of the adjustments (discounts) and volume for Surplus Class I Packaged sales both to contiguous and non-contiguous states
- The volume and value of Class II sales
- The volume and value of Class III cream sales and shrink
- The volume and value of Surplus Bulk milk sales including associated hauling costs
- The cost for inter-Plant hauling between plants

As discussed in the General Observations and Findings Section of this report, the combination of Pooling and Quota systems has contributed to Montana farmers sustaining a level of production within the state that exceeds what is needed for in-State utilization. This over-production puts significant downward pressure on prices. It should be noted that total production did decrease during the calendar period 2015-2017 and this decrease was mirrored by a decrease in Bulk Sales. On the other hand, approximately half of the Producers continued to generate Excess milk, some at a fairly significant volume.

We believe the structure of the Pool should change to accommodate recommended changes in the Quota system and for means of Pricing as well as for reasons associated solely with factors of the Pool itself. We identified and evaluated several different options, as described below, and believe that the first option represents the best approach either on a stand-alone basis or in line with our recommendations related to the other Tasks addressed in this study. The options and our recommendation are as follows.

1) **Pool Option 1:** The first, and our recommended option, is to restructure the Pool to accommodate the differences between the Processors. This could be done in one of several ways.

   (a) **Pool Option 1-A:** The first approach, which is the approach we recommend, would be to have Quota and Excess milk Pooled by Processor or Processor Group.

   The Quota and Excess milk price paid by each Processor would be the result of the utilization at each Processor. Assuming Quota is based on Montana Class I sales (see recommendation in Section 4.d. iii), Producers would have the flexibility and a clear choice as to how much Excess to produce.

   The amount of value received by the Plant for its utilization of Excess milk would determine the price that the Producers shipping to that plant receive for Excess milk.

   Certain issues would need to be addressed but we believe these issues could be resolved in conjunction with the other changes that are made:

   - How to initially apportion Quota volume among the Producers. If Quota volume is reduced proportionately for all current holders of Quota, Darigold Producers would collectively hold more Quota volume than the Class I sales of the Darigold plant, while Meadow Gold Producers would not hold enough Quota to meet Meadow Gold's Class I sales.
   - Whether a Producer associated with one Processor could have a portion or all the Quota volume it held be "assigned" to a different Processor. If so, how would the milk be delivered? If not, would this restrict the market for buying and selling Quota as an asset and make it less liquid?
   - Whether the market for Issued Quota might result in different values for Producers associated with the different Processors. Normally it would be expected that Issued Quota would naturally flow through transactions in the open market to where it was needed.

   If the Cascading Tiered Method is used to allocate utilization value, then many of these issues are resolved.

(b) Pool Option 1-B: A second approach would be to have Quota milk Pooled state-wide while Excess is Pooled by Processor.

This results in all Producers getting paid the same price for Quota milk, but different prices for Excess milk depending on which Processor they ship to and their level of Excess. Setting Quota at a level based on Montana Class I sales would give Producers flexibility and a clear choice as to how much Excess to produce. The value received by the plant for sales of Excess milk would determine the price paid to the Producers for Excess milk.

As described above, there would be the issue of how to reconcile state-wide Quota and actual production with the Class I needs of each Processor and how Excess would be assigned and treated.

A second issue would be how it would work if the recommendation for a Cascade Tiered pricing mechanism is put in place.

(c) Pool Option 1-C: The third approach would be to eliminate the Quota system but Pool by Processor.

Under this option each Processor would pay only for the milk it needs. All Montana milk would be at Montana Class prices. All Surplus Milk (milk that leaves the State) would be priced similar to the existing rules.

Without a Quota system, any incentive for Producers to change production would be primarily price driven and through arrangements agreed to directly between the Processors and their associated Producers.

However, since the Producers associated with Darigold are Darigold Cooperative members, and most of the Producers associated with Meadow Gold are members of the Montana Milk Producers Association, there would likely be sufficient pressure to control production.

Internally, each group could institute its own Quota system that would still be under the purview of the Montana Board of Milk Control if it so desired.

2) <u>Pool Option 2:</u> The second option is to eliminate the Pool altogether but keep the Quota system.

This may not be possible since the Milk Control Bureau's interpretation of 81-23-302(15), MCA is that the statewide Quota system is an optional add-on of the statewide Pool. So, if the statewide Pool system is eliminated, the statewide Quota system would be eliminated by default. Producers delivering to a common

distributor could petition for a Quota plan under that distributor under 81-23-302(14), MCA. The following discussion contemplates that it may be possible.

Pricing for raw milk would still be controlled for all Classes. Each Processor would contract with Producers for the milk it needs. Since Darigold is a cooperative this likely would be straightforward and involve just its current Producer members.

As an independent Processor with independent Producers, Meadow Gold would appear to have more flexibility as to how it sourced milk, which in turn could have a different impact on its current Producers than Darigold. Also affected might be the volume of milk transported to Billings and by whom.

Potential outcomes of eliminating the Pool are that each plant would be freer to acquire and pay for the milk it actually needs and could more easily avoid having to deal with Surplus. Any special sales relationships would affect only those Producers who are involved with the plant or in the specific contractual relationship.

Each Producer could decide how much milk to produce and possibly to which plant they should ship based on payments offered by the Processors. Darigold, as a formal cooperative, could create and require compliance with specific rules to manage its members, whereas Meadow Gold may approach the issue differently. Special discounted sales at one Processor would only affect those Producers participating with that Processor, or possibly only those Producers who want to participate in that sale at assumed lower returns.

Producers losing their relationship with a Processor would have to find a home for their milk on their own. The Montana Board of Milk Control could potentially help facilitate these “distressed” sales, but the value received would go directly to the Producer and likely would be lower than the current blended price.

Competition among Producers trying to find a home for their milk could drive down returns for all Producers, but the bottom price paid for milk processed and sold in Montana would be limited to Montana Class minimums. In theory, this competition could benefit the Processors, but since they are already paying the Class prices, it is unlikely they could reduce their cost.

If a Quota system is kept and the Pool eliminated, a number of difficult issues arise, and we do not advocate this because each Processor would have to manage the Quota associated with it through its affiliated Producers. A significant question would be what happens to unaffiliated Producers who hold Quota?

It may be necessary to give Pool plants the flexibility to make suitable arrangements among each other to keep Quota affiliated with them and production in balance. Or

the relative difference in the asset value of Quota may drive the sale of Quota to where it is needed.

In general, both Darigold and Dean (Meadow Gold) are large organizations with operations in many states. It is likely that they both have experience managing milk supply and pricing in other states where there is no Pool, which should allow them to appropriately manage their operations in the absence of a Pool.

3) **Pool Option 3:** The third option is to keep the Pool essentially the same as it is now with perhaps some slight revisions.

All Producers would remain in the Pool. Depending on changes to Quota, Producers could be paid a greater Differential between Quota and Excess milk.

Certain changes could be implemented to effect changes in certain components, such as the inter-Plant hauling charges and out-of-State bulk transport costs.

4.d. ix. Incremental Cost of Milk Production

The purpose of establishing a Quota system and a Pool in Montana is to strengthen the Dairy industry in the state. If properly implemented, the Quota system should strengthen Producers by allowing them to individually control their own production and maximize profits.

The Pool protects Producers from competition between the plants by Pooling all the milk, so it doesn't matter to the Producers how much milk each plant processes and sells. But at the same time, under the current rules, it helps subsidize and maintain certain inefficiencies that might otherwise be driven out of the system.

When not properly implemented, a Quota system and Pooling can have the detrimental effect of lowering milk prices and potentially affect the quality of the milk. The goal should be to keep the elements of the Quota system and the Pool that prevent undue price competition in place while also addressing issues that inhibit continuous efficiency improvement, thereby helping to guarantee an adequate supply of quality milk to the Montana Processors and ultimately to the residents of the State.

If Quota volume is established based on Class I Montana demand, then the Quota milk price should be close to the Class I price. The viability of the existing Processors depends, to some extent, on their sales of other Classes of products, as well as bulk milk and Packaged Surplus sold outside of Montana. The amount of Excess milk (milk produced in Excess of Quota volume) available to supply the plants will depend on the price paid for the Excess and the incremental cost of production by the Producers. If it is worthwhile for the Producers to supply additional milk at the lower price, they will do so. Otherwise, there may not be sufficient supply available at that price.

The State of Montana does not track the cost of Dairy Production on the farm, and most of the key inputs are not summarized by the State. However, many of the pieces are available from other sources. California tracks the cost of production by region within the state and by farm size. There also is a summary for Holstein and Jersey cows.

The USDA has cost of production data by farm size, but it is somewhat dated and is being discontinued, although recent data is useful as a comparison. USDA also tracks dairy farm costs and margin for many states. Montana is not one of them, but neighboring Idaho, Oregon and Washington are tracked. Even though they are much larger milk-producing states than Montana, and have on average much larger dairies, the data may provide some reference. It should be noted that the California data is different from the USDA data for California. Given that the last complete collection of USDA data was 2010, it is likely that the California data is more accurate.

Below is the USDA data on Dairy Farm Costs of Production by Herd size, published by the Economic Research Service (ERS). The last complete data collection was 2010, so that is what is shown. The cost amounts have changed over the last several years, but it is likely that the relationship between the herd sizes has not changed significantly.

Milk Production Costs and Returns per Hundredweight (cwt) Sold, by Size Group

Item	Fewer than 50 cows	50-99 cows	100-199 cows	200-499 cows	500-999 cows	1,000 cows or more	All Sizes
	dollars per cwt sold						
Gross value of production:							
Milk sold	17.59	17.39	16.94	16.88	16.34	15.34	16.26
Cattle	1.56	1.31	1.14	0.99	1.02	0.97	1.07
Other income 2/	0.93	0.88	0.78	0.77	0.71	0.67	0.74
Total, gross value of production	20.08	19.58	18.86	18.64	18.07	16.98	18.07
Operating costs:							
Feed--							
Purchased feed	5.04	4.65	4.97	6.02	6.32	6.91	6.09
Homegrown harvested feed	7.32	6.82	6.06	4.91	3.39	2.05	3.97
Grazed feed	0.50	0.23	0.15	0.12	0.02	0.02	0.10
Total, feed costs	12.86	11.70	11.18	11.05	9.73	8.98	10.16
Other--							
Veterinary and medicine	0.78	0.87	0.77	0.90	0.88	0.63	0.76
Bedding and litter	0.38	0.37	0.32	0.30	0.28	0.11	0.23
Marketing	0.24	0.20	0.21	0.22	0.27	0.21	0.22
Custom services	0.60	0.59	0.61	0.67	0.66	0.38	0.53
Fuel, lube, and electricity	1.08	0.97	0.80	0.79	0.59	0.46	0.66
Repairs	0.98	0.92	0.65	0.64	0.38	0.39	0.54
Other operating costs 4/	0.03	0.01	0.00	0.00	0.00	0.00	0.00
Interest on operating capital	0.02	0.02	0.01	0.01	0.01	0.01	0.01
Total, operating cost	16.97	15.65	14.55	14.58	12.80	11.17	13.11
Allocated overhead:							
Hired labor	0.56	0.85	1.25	1.85	1.87	1.50	1.46
Opportunity cost of unpaid labor	13.48	6.92	3.47	1.42	0.50	0.16	2.19
Capital recovery of machinery and equipment 4/	7.61	6.18	4.37	3.49	2.42	1.90	3.28
Opportunity cost of land (rental rate)	0.12	0.05	0.04	0.02	0.01	0.00	0.02
Taxes and insurance	0.33	0.31	0.24	0.22	0.16	0.09	0.18
General farm overhead	1.00	0.90	0.72	0.68	0.43	0.41	0.58
Total, allocated overhead	23.10	15.21	10.09	7.68	5.39	4.06	7.71
Total costs listed	40.07	30.86	24.64	22.26	18.19	15.23	20.82
Value of production less total costs listed	-19.99	-11.28	-5.78	-3.62	-0.12	1.75	-2.75
Value of production less operating costs	3.11	3.93	4.31	4.06	5.27	5.81	4.96
Supporting information:							
Milk cows (head per farm)	33	68	135	312	699	2,251	175
Output per cow (pounds)	15,378	17,136	18,925	19,840	22,546	23,019	20,620
Milking frequency more than twice per day (percent of farms)	2.07	2.59	8.53	30.50	59.80	55.30	9.42
Milk cows receiving bST (percent of cows)	1.98	3.34	5.35	11.95	21.85	6.80	8.78
Organic milk sold (percent of sales)	10.60	5.65	3.65	2.63	0.58	1.90	2.84

1/ Developed from survey base year, 2010.

2/ Income from renting or leasing dairy stock to other operations; renting space to other dairy operations; co-op patronage dividends associated with the dairy; assessment rebates, refunds, and other dairy-related resources; and the fertilizer value of manure production.

3/ Costs for third party organic certification

4/ Machinery and equipment, housing, manure handling, feed storage structures, and the dairy breeding herd.

Source: USDA-ERS, US national average data from 2010

There are several interesting observations that can be made. The larger dairies receive less in revenue per cwt. This is likely because larger farms tend to ship to larger Processors, usually cheese and powder plants. Larger Farms also may be in areas that are not regulated or less regulated where the milk prices are lower, or they may be in a state, like California, where the price for Class III milk and below is lower than USDA prices, and some large farms contract directly with the Processor at a fixed or standard rate.

While the cost of Purchased Feed increases with Dairy Size, the Total Feed Cost decreases with size. The cost of Homegrown harvested feed is much less for large herds, likely because large herds graze less and use less homegrown feed. Purchased Feed cost is 27% more for herds with 500-999 cows compared to herds of 100-199 cows, while total feed cost is 13% less, which is $1.45 per cwt less.

There is a trade-off between Labor and Utilities although labor generally increases with herd size until 1,000 cows is reached. More automation generally requires more electricity and less labor per cow. The cost of Repairs tends to decrease significantly with herd size.

Other Costs, in total, and excluding Feed, are not that different for different herd sizes unless the herd is under 100 cows or over 1,000 cows. Ignoring the largest and smallest farms Feed averaged about $3.50 per cwt in 2010. The Other Costs for dairies with 500 cows is only $0.30 per cwt less than for 100 cows.

Since most Allocated Overhead costs are fixed, they are spread over greater volume as herd size increases, resulting in a drop per cwt. One notable exception is Hired Labor which actually increases with herd size until 1,000 head is reached.

California collects a lot of state-wide cost data, some of which is summarized here.

California Statewide Cost Comparison Summary				
Cost / cwt	2014	2015	2016	2017
Feed	11.06	10.51	9.29	8.85
Hired Labor	1.57	1.69	1.77	1.88
Herd Replacement	1.38	2.14	2.12	1.87
Operating Costs	2.88	2.92	2.92	3.05
Milk Marketing (incl Hauling)	0.56	0.56	0.55	0.55
Total Cost	17.44	17.82	16.65	16.20
Return on Invest & Mgmt	1.67	1.52	1.42	1.40
Total	19.11	19.34	18.07	17.60
Pounds/cow/day	73.17	72.47	72.91	71.61
Income over Feed Cost	11.27	5.45	6.28	8.15
Income over Total Cost	4.88	(1.85)	(1.08)	0.80
Total Cows	1,404	1,407	1,483	1,514

https://www.cdfa.ca.gov/dairy/uploader/postings/copcostcomp/Default.aspx

This can be compared to some of the other data collected. Most cows in California are either Jerseys or Holsteins, and data is collected for each. As an example, the following chart is for Jersey cow feeds in fourth quarter 2017.

California Jersey Dairies - Feed Summary

4th Quarter 2017-Weighted Averages, Based on CDFA Cost Study Dairy Surveys

FEED	MILK COWS				DRY COWS			
	$ Per Ton[1]	As Fed #'s Per Cow Per Day[1]	Dry Matter #'s Per Cow Per Day[2]	% of Total Feed Cost[1]	$ Per Ton[1]	As Fed #'s Per Cow Per Day[1]	Dry Matter #'s Per Cow Per Day[2]	% of Total Feed Cost[1]
DRY ROUGHAGE								
Alfalfa Hay	$268.39	4.59	4.11	11.1%	$139.73	1.61	1.45	5.2%
Other Hay	$94.48	1.24	1.03	1.0%	$131.11	6.24	5.27	1.2%
Almond Hulls & Shells	$73.53	3.41	3.05	2.1%	$71.46	1.63	1.46	0.2%
Total Dry Roughage	**$173.18**	**9.23**	**8.19**	**14.5%**	**$122.30**	**9.48**	**8.18**	**26.9%**
SILAGE								
Corn Silage	$60.84	26.17	8.68	14.4%	$60.84	10.36	3.43	14.6%
Other Silage	$48.87	7.42	2.52	3.3%	$45.71	22.80	7.72	24.2%
Green Chop	$0.00	0.00	0.00	0.0%	$0.00	0.00	0.00	0.0%
Total Silage	**$58.19**	**33.60**	**11.20**	**17.7%**	**$50.44**	**33.16**	**11.16**	**38.8%**
OTHER FORAGES & WET FEEDS								
Earlage	$0.00	0.00	0.00	0.0%	$0.00	0.00	0.00	0.0%
Wet Distiller Grain	$60.57	2.50	0.76	1.4%	$60.57	0.83	0.25	1.2%
Wet Corn Gluten	$64.11	1.92	0.76	1.1%	$64.11	1.16	0.46	1.7%
Whey	$24.68	0.53	0.09	0.1%	$24.68	0.28	0.05	0.2%
Other Wet Feeds	$30.21	0.63	0.13	0.2%	$11.28	0.61	0.14	0.2%
Total Other Forages & Wet Feeds	**$54.95**	**5.58**	**1.75**	**2.8%**	**$48.03**	**2.88**	**0.90**	**3.2%**
CONCENTRATES & BYPRODUCTS								
Inside Barn Mix	$0.00	0.00	0.00	0.0%	$0.00	0.00	0.00	0.0%
Rolled Corn	$172.53	10.61	9.38	16.6%	$172.53	1.12	0.99	4.5%
Rolled Barley	$0.00	0.00	0.00	0.0%	$0.00	0.00	0.00	0.0%
Whole Cottonseed/Pima	$293.09	3.71	3.41	9.8%	$294.27	0.17	0.16	1.2%
Soybean Meal	$322.32	0.71	0.63	2.1%	$322.32	0.07	0.06	0.5%
Canola	$265.14	2.96	2.71	7.1%	$265.14	0.61	0.56	3.7%
Beet Pulp	$165.75	0.16	0.15	0.2%	$165.75	0.02	0.02	0.1%
Wheat Millrun	$142.69	0.48	0.43	0.6%	$0.00	0.00	0.00	0.0%
Dried Distillers Grain	$181.73	1.78	1.64	2.9%	$181.73	0.28	0.26	1.2%
Other Grains & byproducts	$294.65	4.32	3.94	11.5%	$315.46	1.47	1.33	10.8%
Mill/Custom Mix	$281.00	2.49	2.17	6.3%	$0.00	0.00	0.00	0.0%
Total Concentrates & Byproducts	**$232.28**	**27.23**	**24.47**	**57.2%**	**$252.68**	**3.75**	**3.38**	**22.0%**
MINERALS & ADDITIVES								
All Minerals	**$327.12**	**2.66**	**2.24**	**7.9%**	**$448.80**	**0.88**	**0.77**	**9.1%**
PASTURE								
Pasture	**$0.00**	**0.00**	**0.00**	**0.0%**	**$0.00**	**0.00**	**0.00**	**0.0%**
TOTALS	**$141.19**	**78.29**	**47.85**	**100.0%**	**$85.98**	**50.15**	**24.38**	**100.0%**

Cost Per Cow-Per Day	$5.53	Cost Per Cow-Per Day	$2.16
Cost Per Cwt. of Milk	$9.45	Cost Per Cwt. of Milk	$0.63
Avg. Milk Cows	2,155	Avg. Dry Cows	367
Milk Production Per Cow-Per Day	58.51		

1 All figures based on weighted averages

2 Dry Matter is estimated

This table represents California Jersey herds that participate in the Cost of Production Survery. This table does not include organic herds

Summarizing this data:

Jersey Feed Cost	2015	2016	2017
Alfafa Hay per ton	307.95	249.33	255.12
Alfalfa Cost per cwt	1.51	1.15	1.07
Corn Silage per ton	84.55	71.66	56.98
Corn Silage per cwt	1.36	1.26	1.25
Cost Per Cwt. of Milk	11.13	9.59	9.17
Avg. Milk Cows	1,996	2,033	2,043
Milk/Cow/Day	60.14	61.43	59.75
Based on CDFA Cost Study Dairy Surveys			

Holstein Feed Cost	2015	2016	2017
Alfafa Hay per ton	272.37	223.43	221.01
Alfalfa Cost per cwt	1.56	1.29	1.16
Corn Silage per ton	78.58	67.05	57.97
Corn Silage per cwt	1.39	1.15	1.06
Cost Per Cwt. of Milk	9.36	8.31	7.88
Avg. Milk Cows	1,216	1,313	1,358
Milk/Cow/Day	77.09	77.42	76.65

The reported cost of feed in California in 2016 averaged $9.59 for Jersey cows and $8.31 for Holsteins. This compares to a statewide average of $9.29 (above). A relevant issue to evaluate is the margin between milk revenue realized and the input cost of various feeds used to affect the butterfat content for each breed and whether higher feeds cost result in higher butterfat content and revenue to justify them.

Alfalfa and Corn are the two largest feed components and are both tracked by USDA NASS. The cost of these inputs can be compared between California and Montana and the surrounding states. The following is USDA NASS data.

Price of Alfalfa ($ per ton)	2014	2015	2016	2017
CALIFORNIA	244	181	155	175
IDAHO	200	170	129	136
MONTANA	127	125	134	142
OREGON	228	200	164	172
SOUTH DAKOTA	117	105	89	111
WASHINGTON	213	171	135	155
Based on USDA Statistics database				

Price of Corn ($ per Ton)	2014	2015	2016	2017
CALIFORNIA	189	173	185	165
IDAHO	164	185	175	167
MONTANA	148	158	163	138
OREGON	175	157	167	152
SOUTH DAKOTA	131	130	122	118
WASHINGTON	193	169	185	167

Unfortunately, the USDA reported prices don't tie to the dairy farm prices. The likely reason is that most farms lock in prices during the harvest, and therefore the prices should be lower than the annual average. Also, both hay and corn come in a variety of qualities. The alfalfa hay used on the dairy farms appears to be of above average quality. The corn fed to the cows is silage and is definitely below the average value of field corn, which would include corn for food processing, cereals, and many other products, both food and non-food. However, the relative USDA crop prices probably are valid.

Interestingly, the Montana crop prices are lower than California, and lower than the surrounding states other than South Dakota. This would tend to argue that Montana feed costs

may be lower than California. However, the average herd size for the California data is around 2,000 cows, which is considerably larger than the Montana herd sizes. Looking at the USDA data by herd size (above), the cost of feed is 20% lower for herds over 1,000 cows than herds around 200 cows. The net result is that it appears that the feed costs per cwt for Montana dairies might be 5-10% higher than California. Using this metric, and comparing the feed costs to the value of milk received, results in the following:

Montana Income Over Feed Cost			
Cost / cwt (3.5% bf)	2015	2016	2017
Average Pool price (Quota)	15.91	14.50	16.30
Estimated Feed Cost	11.56	10.22	9.73
IOFC	4.35	4.28	6.57

A key statistic used to measure profitability is IOFC, or Income Over Feed Cost. The IOFC measures the additional value available to cover other costs after Feed, which is the single largest cost. If the assumptions are correct, in 2015 and 2016 there was about $4.30 per cwt available. In 2017, it was over $6.50 because the spread between Pool price and feed cost improved.

From the earlier charts, the Other Costs (excluding labor) are between $3.50 and $4.00, so before fixed costs (including hired labor), the average farm was positive. In 2017, this improved further.

If the difference between Quota and Excess is $1.50, then Producers over the last few years were paid less than their incremental cost for Excess Production, but positive for Quota production. If Quota were set close to Class I, then the IOFC for Quota would have been:

Montana Income Over Feed Cost (Quota=Class I)			
Cost / cwt (3.5% bf)	2015	2016	2017
Quota at Class I	18.60	17.22	19.11
Estimated Feed Cost	11.56	10.22	9.73
IOFC	7.04	7.00	9.38

In this case it appears that IOFC might also cover most of the fixed costs. The IOFC for Montana Excess, assuming Quota had been set at Class I volume, would have been:

Montana Income Over Feed Cost-Excess (Quota=Class I)			
Cost / cwt (3.5% bf)	2015	2016	2017
Net Price of Excess	13.89	12.52	14.31
Estimated Feed Cost	11.56	10.22	9.73
IOFC	2.33	2.30	4.58

This would not have covered the Other Costs in 2015 and 2016 and there likely would have been a reduction in volume during that period. This analysis was performed using pricing at 3.5% butterfat whereas actual payments to Producers depend on the actual butterfat content in their milk.

4.e. Study Task 5 - Expansion

We evaluated the plausibility and feasibility of expanding dairy processing and manufacturing in Montana, and the impact such expansion would likely have on the potential growth in milk production in Montana.

As described in the Observations and Findings section of this report, the dairy industry in Montana reflects trends that are occurring both nationally and regionally:

- Overall fluid milk consumption is trending down although, recently, higher fat content in fluid milk has been trending up
- There is an oversupply of milk that, in concert with declining consumption, creates a certain level of pricing volatility, although many factors contribute to pricing and the margins at the farm level
- Many dairies are ceasing operations while the average herd size of those that remain has increased to generally take up the slack
- The economics of dairy farming favors farms with sufficient size to realize economies of scale. Farms with herds larger than 2,000 cows can realize cost efficiencies of 25% per cwt compared to dairies with 500 or fewer cows that represent the bulk of Montana's farms
- These trends of lower demand for fluid milk and consolidation of farms, as well as Processors, are expected to continue

Juxtaposed against these national and regional dairy trends is the fact that a number of Montana's neighboring states dwarf Montana in the size and growth of their respective dairy industries. Idaho, Washington, Oregon, Utah and Colorado are vastly larger than Montana in all respects, from milk production, processing facilities and capacity, and growth. South Dakota, which is 9 times the size of Montana, recently announced an expansion to a cheese plant that will ultimately process 9 million pounds of milk per day.

In concert, these factors present a significant challenge for Montana when trying to consider whether there may be opportunities to expand. Detailed industry retail data, provided by private firms such as IRI, are needed to perform a detailed analysis of where there may be potential opportunities for entry of specific products into Montana's local and regional market. However, these data sources are provided only on a subscription basis and are expensive to obtain and thus were outside the scope of what our analysis could include.

The following discussion therefore focuses on a selected portfolio of the types and scale of products and facilities that could be evaluated in regard to how or where investment could be made in new or expanded facilities that would provide some level of growth for the industry.

Investment in a dairy plant is primarily based on being able to operate profitably and sustainably with available milk at the right price being a large part, but not the only driving component of the equation. To attract a manufacturing plant, the milk cost must be similar or lower than in other locations, but the other costs must be competitive as well. There must be adequate utilities and labor at reasonable costs, sufficient water for plant needs, adequate wastewater facilities at reasonable cost and a regulatory environment that is not cost prohibitive.

Assuming the environment can be structured to make operating a dairy plant feasible, there remains the question of which products make sense for investment. Data provided by the Board of Milk Control presents the volume of various Dairy Products consumed in Montana as well as the volume of those products that are produced in Montana versus brought in from other States. We evaluated these volumes to determine whether it would be potentially feasible to produce more of these products in the State.

4.e. i. Fluid Milk

Fully 85% of the Class I milk consumed in Montana is produced in Montana. The bulk of the remaining 15% brought in from out-of-State is likely in extended shelf life specialty milk in single serve and half-gallon containers (organic, lactose reduced, and nationally branded specialty and chocolate milks) and in any case, represents just 3.25 million gallons in volume.

Assuming the bulk of the 3.25 million gallons is extended shelf life product, there is probably insufficient volume to justify building a UHT (Ultra High Temperature) or ESL (extended shelf life) plant to produce these products. The rule of thumb in the industry is that a UHT plant requires a minimum of approximately 5 million gallons throughput per year to be sustainably profitable. In addition, since much of this volume is likely already served by national brands, it is likely that only a small portion could be converted to in-State production.

4.e. ii. Yogurt

In fiscal 2017, a little more than 18 million pounds of yogurt was sold in Montana with 98% coming from outside the state. Assuming an in-State facility could achieve a 20% market share, those sales would equate to 3.5 million pounds a year.

We assumed that a large share of the yogurt brought into Montana is likely national branded product (Danone, Yoplait, Chobani, etc.) or private label. For perspective, 398,000 pounds of yogurt are currently produced in the State. Adding sour cream under the same market share

assumption (20%) would increase the required volume of raw milk by about 36% or about another 1.25 million pounds.

To minimize investment, we assumed that volume would be produced as an add-on to an existing plant as opposed to building a greenfield plant. Further, assuming a 5-day per week processing schedule, would require processing 13,461 pounds of milk per day, to make 35,897 6-ounce packages of regular yogurt per day.

A typical high-speed yogurt filling line running at around 280 packages per minute would take little more than 2 hours per day to meet the required sales volume. A slower speed line might run 4-5 hours and come closer to a full shift when normal down-time and change-overs (e.g., for product and label changes) are included, but running at slower speeds incurs and absorbs other costs at a different rate than a higher speed line. The choice of filler line would take many factors into account.

With this low volume of plant production, it would be difficult to justify the level of investment required unless the target market share goal, or higher, was effectively guaranteed and could be achieved within a planned period of time.

Even with minimal investment, such a plant would be hard pressed to compete on efficiency and cost with large plants in the region, even those that are up to 500 miles away. On the other hand, a small, locally based yogurt operation that could sell a niche, specialty product at a higher price would appear to offer the best approach to attract investment in a start-up operation.

These calculations assumed regular yogurt was being made. For perspective, a pound of milk generates close to a pound of regular yogurt. It would take a single herd of approximately 140 cows to produce the volume in our example given the average daily production of cows in Montana. Greek yogurt, which typically requires 3 pounds of milk for each pound of yogurt, would obviously utilize more milk, but requires a much higher investment to manufacture.

As noted earlier, adding sour cream under the same market share assumptions would increase the required volume of milk by about 36% and move plant utilization closer to a standard full shift. Since sour cream and yogurt can utilize the same filling equipment, this would help the investment equation. Like yogurt, investment would likely require customers in hand that met or represented close to the target market share. We also assume a good deal of the sour cream currently being sold in the state is national brand and private label. It would be difficult to establish co-pack agreements for those products.

4.e. iii Cheese

The largest volume opportunity for Montana is cheese, assuming that it is simple cheddar or something similar. Again, assuming a 20% market share of Montana's cheese sales would

equate to 5.36 million pounds of cheese requiring 53 million pounds of milk, or just over 1 million pounds of milk per week.

In today's market, commodity cheese plants need to process about 1 million pounds per day to be sustainably profitable. The Agropur plant in South Dakota recently announced an expansion that is targeted to ultimately process 9 million pounds of milk per day. For perspective, all of Montana's current milk production does not equal 1 million pounds of milk per day.

Such an investment would have to be based on obtaining significant out-of-State volume in competition with large national plants, and multiple plants in the region, with established shares of the market. Given the above, we do not see much opportunity for establishing a large cheese operation.

However, it may be feasible to start small and produce cheese that would be sold as a premium private label cheddar or other specialty cheese, at a premium price. Once established, it may be possible to expand the plant to offer additional products that target certain commodity cheese on the open market. We reviewed 2 studies on costing a small artisan cheese plant.

- Nebraska Specialty Cheese Plant 2002, Reports from the Food Processing Center, University of Nebraska – Lincoln
- Start-up and operating costs for artisan cheese companies, American Dairy Science Association, 2014, Andrea Bouma, Catherine A. Durham, and Lisbeth Meunier-Goddik (Oregon State University)

The Oregon Study concluded that a very small cheese plant, producing 30,000 to 60,000 pounds per year (13,000 kg to 27,000 kg) could be built for $350K to $600K. This is 2,300 pounds of milk per day, assuming a 5-day week, and reflects the production from about 35 cows, given Montana's average production per cow. The estimated production cost in the first year is just over $10.00 per pound. Note that commodity block cheese on the CME is currently selling for about $1.50 per pound.

The Nebraska study estimated the cost of a larger cheese plant, processing 30,000 pounds of milk per day (7.8 million pounds of milk per year assuming a 5-day week, which will produce about 780,000 pounds of cheese per year). The plant cost is estimated at between $500,000 and $1 million and does not include any facility for aging the cheese. Adjusting for inflation, the cost today would be between $650,000 and $1.3 million. Estimated production cost was $2.32 per pound, or just over $3.00 adjusted for inflation. This reflects about 312 cows, given Montana's average production per cow.

4.e. iv. Other Products

There are a number of other niche products that could be considered for Montana with modest investment:

- *Butter* – a small churn to make butter from cream is relatively easy to install

- *Ghee,* or clarified butter – has long been used in Indian cooking and is now gaining favor everywhere. Ghee boasts a rich, nutty flavor, and is lactose-free, which makes it easier to digest. Ghee is almost pure butterfat and is generally made from butter, so an available supply of butter would be needed
- *Carbonated milk* – this has been tried numerous times and Arla, a Danish firm, is currently pursuing this market

4.e. v. Cost Summary

The total milk supply in Montana for calendar 2017 was about 280 million pounds of which about 147 million pounds was utilized for Class I sales in Montana. This leaves about 364,000 pounds per day of potentially available milk with some seasonal swings. This puts Montana in the position of too much milk for small plants and not enough for large plants. In other words, small plants, such as described above, may be viable, but will not go very far in utilizing the current volume of Surplus milk in Montana whereas large plants would require much more.

Our conclusion is that the current volumes in-State are insufficient, and the required expansion of milk production is too great to attract much interest in any kind of major dairy processing investment, but there may be a number of small, specialty plants that could be viable.

Opportunities for selling certain specialty products to out-of-State markets may exist but given some of the large Processors in the region (especially for yogurt and cheese), penetration would be difficult and likely take considerable time and associated investment. A brand associated with an existing local product (like the egg line from Montana Eggs LLC) may provide a path for market entry and expansion.

Given the nature of markets in Idaho, Utah, Washington, Oregon and other nearby states, it will probably require a food broker to expand sales out-of-State once the plant is functioning and distributing product in Montana.

Another option that could be tried is to lower the Class III cost of milk by recalculating the Class III price using a larger make allowance. The result is a lower cost for the manufacturers but also a lower price to the Producers. California's dairy farmers did this 20 years ago when the State order was created to attract investment, but they had a low cost of production based on large farms and low-cost purchased feed. This likely would be difficult for Montana to duplicate. Because other states now have similar lower costs of production, the model is not working as well for California today, and that is why they are considering moving to the Federal Order.

4.e. vi. Montana Business Environment

Forbes 2017 Best States for Business ranks Montana at #32 overall. The ranking components, and Montana's rank for each, are:

Component	Montana
Labor Supply	19
Growth Prospects	25
Business Costs	26
Economic Climate	31
Regulatory Environment	33
Quality of Life	36

This puts Montana in the middle of the pack and especially at a disadvantage compared to most of its neighboring States other than Wyoming, which has no dairy processing. According to the Forbes article, the overall rank of neighboring states is:

State	Rank
Utah	3
Nebraska	4
Colorado	8
North Dakota:	9
Washington:	11
South Dakota:	17
Oregon:	18
Idaho	20
Nevada	24
Montana	32
Wyoming	38

Any potential dairy related investor will naturally compare Montana with what other states in the region have to offer, both in terms of business climate and the dairy industry itself. In dairy production, Montana ranks 6 out of 7 in the region (Wyoming is last and has no dairy manufacturing) and is not growing. Other states are already much bigger, and growing, with some growing annually by more than Montana's total annual production. This means that Montana would likely have to go well above and beyond its neighbors to offer something that is differentiated and represents a better opportunity to attract a significant level of investment.

Alternatively, Montana could work to create an environment that attracts much smaller niche or micro markets as starting points to attract small "entrepreneurial" type investors.

4.e. vii. Encourage Development

The simplest, least-cost and near-term potential for growth in Montana's dairy industry is to create and promote an environment that fosters and attracts small-scale entrepreneurial investments in dairy production. Entrepreneurial small-scale start-ups could be supported in a number of ways including:

- Providing assistance with ideation, design, and Business Plans
- Providing assistance through entrepreneurial zones and related business development economics and incentives
- Fostering small-scale start-ups with advertising and promotional events
- Providing resources for Producers and Processors to learn, invest, and expand

Many states have set-up government and public-private partnerships to assist the industry. For example, Pennsylvania has a number of such organizations:

- Center for Dairy Excellence
- PA Preferred
- PA Bureau of Market Development
- PA Farm Bureau

Appendix A – Strategic Perspective

Given the purpose of the study, our findings, observations and analysis, the following strategic construct was used to provide the basis for making choices in our development of recommendations.

In summary, we believe recommendations for change should provide systems for pricing, Pooling, Quota and rule-making that rewards efficiency and incentivizes the system to wring costs out of the overall dairy industry value chain. Montana must improve its competitiveness, especially within its own market, to remain viable.

Over time Montana needs to continually rationalize its overall system. Ultimately this likely means a continuation of the trend towards fewer but larger Producers, and fewer but more efficient plants operating near or at capacity. Continued consolidation will likely happen in any case, but without a defined structure it may not occur in a way that provides the greatest benefit to the efficiency of the overall value chain.

Other perspectives and objectives that influenced our evaluation of alternatives and recommendations were to create and support a system and processes that:

- Provide as much simplicity, ease and transparency as possible. How things work should be as simple and understandable to enable rational decision making, especially for Producers. Montana is a small system and should not be overly complex to manage and regulate
- Incorporate flexibility and ability to make near term adjustments into the system. Montana is a small player and needs to be nimble to survive
- Create a structure that allows the system to adjust on its own to changes in its markets and environment and react quickly to both grab opportunities and address threats
- Give industry players opportunity, latitude and flexibility to make choices but protects the core Class I fluid business in Montana. Ensure Producers and Processors are fairly treated for core Class I business
- Enable industry to self-manage opportunities above that level. This may tend towards less regulation of non-Class I business and especially sales outside of Montana where players can choose to participate or not, or can openly and freely negotiate arms-length terms

If well structured, the system should, by its nature, provide an environment that not only improves the existing business but provides an attractive environment for investment in growth.

Appendix B – Project Activities

The following summarizes the research and analyses that were performed:

- Visit to Montana
  - Met and spoke with Processor personnel at the three fluid milk bottling plants in in Billings and Great Falls (Dean Foods Meadow Gold) and Bozeman (Darigold)
    - Conducted subsequent conference calls with both Processors
  - Met and spoke with Darigold Coop Producers in Bozeman and Meadow Gold Producers in Great Falls from the Montana Milk Producers Association
    - Conducted subsequent calls with individual Producers
  - Met with representative of a firm possibly interested in building a dairy plant
  - Met with Rowley Transport company
  - Met individually with all of the Board of Milk Control members
  - Met with Krista Evans, lobbyist for the Montana Milk Producers Association
  - Attended Board of Milk Control meeting on Dec 14th

- Developed and sent out detailed questionnaires
  - To each of the three Processing plants
  - To all of the dairy Producers. Received 12 back
  - Held follow-up informational calls with key individuals at both Meadow Gold and Darigold

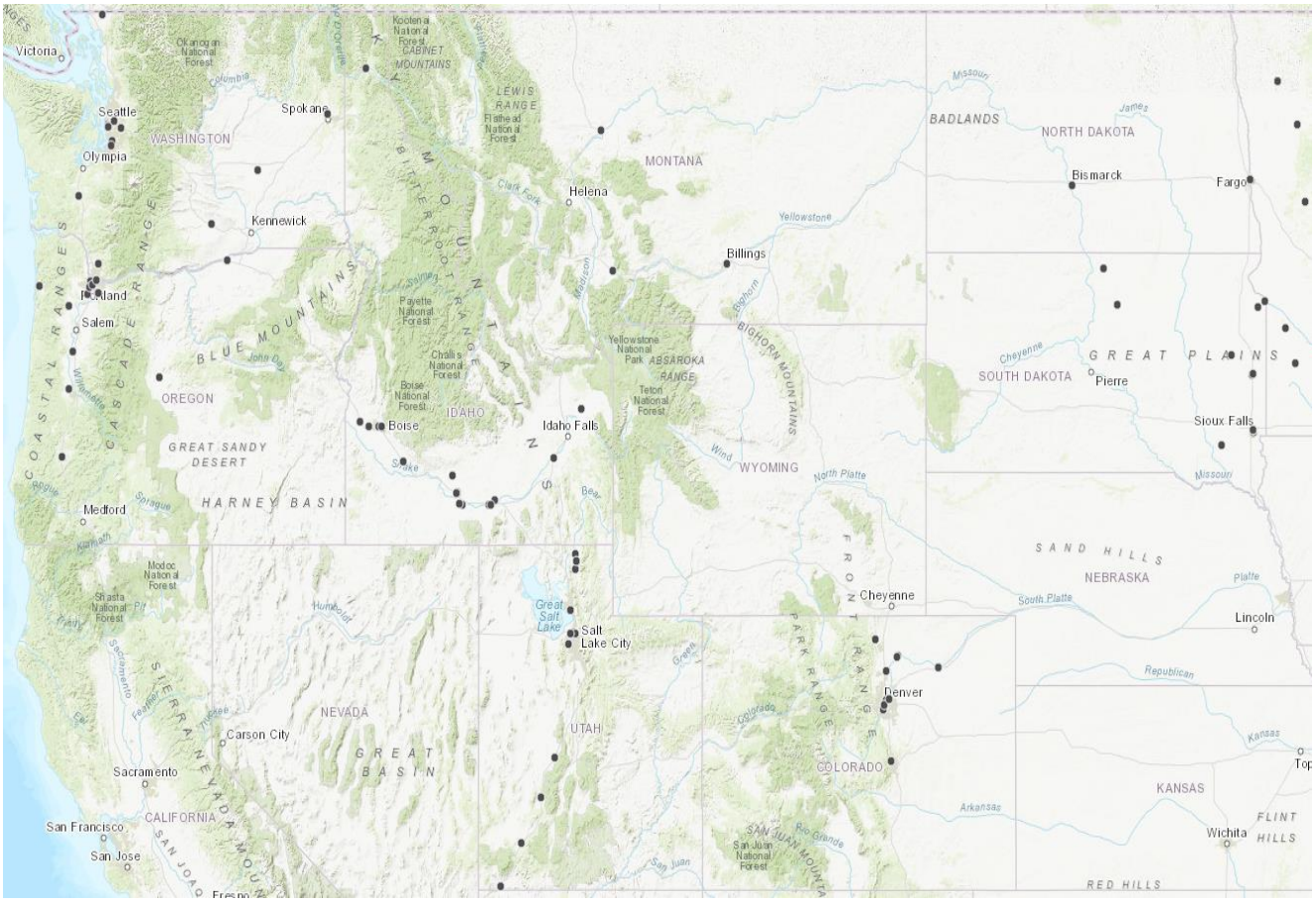
- Requested and received detailed information from Montana Milk Control Bureau
  - Detailed data on milk production, utilization, and consumption in Montana
  - Data about Producers
  - Milk volume sources in-State and from out-of-State
  - Data about milk use in-State and out-of-State
  - Pooling calculation detail by month over the last few years
  - Data and map of dairy plants in surrounding states
  - History of Producer retirements and additions
  - Analysis of freight payments by Producer and Pool

- Performed additional research and analysis
  - Order structure of neighboring and selected other States
  - Pool structure of neighboring and selected other States
  - Milk pricing in neighboring States
  - Milk prices received by Producers in Montana and neighboring States
  - Historical pricing and cost data from USDA and other sources
  - Cost of milk production in Montana compared to neighboring States
  - Review of several states regarding their Quota programs
  - Spoke with various dairy participants with expertise in various dairy related issues and approaches outside of Montana

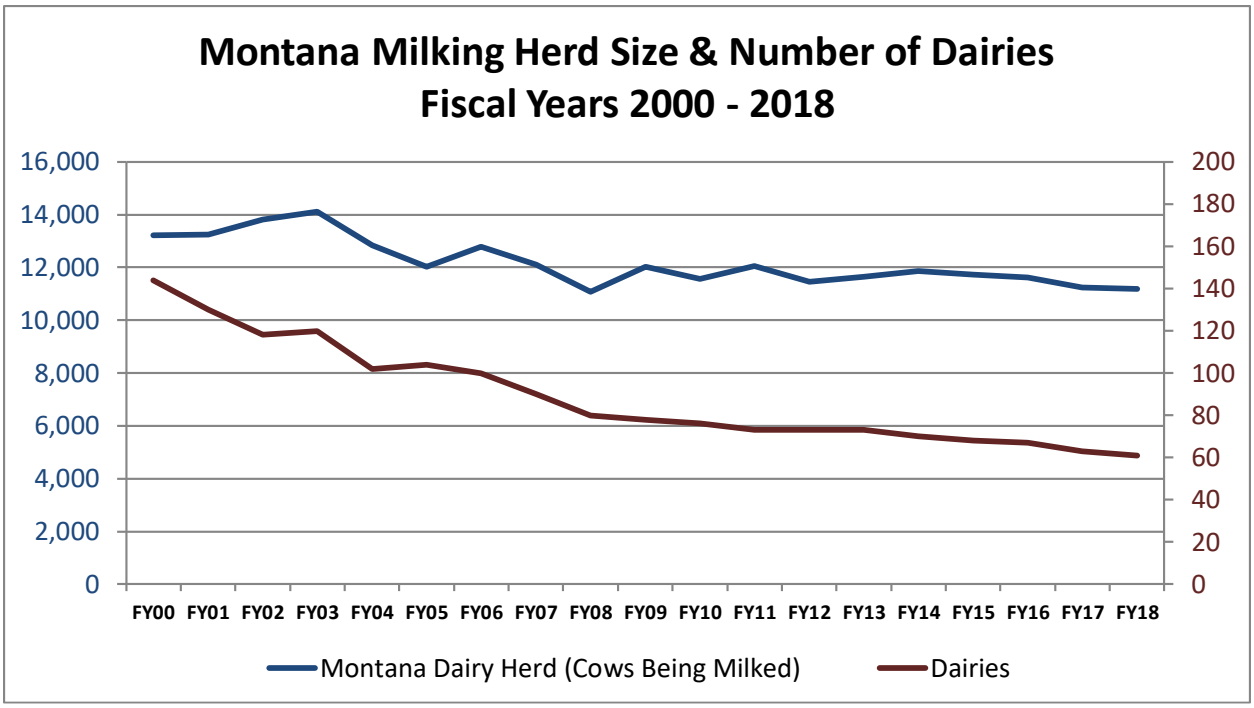
- Performed analyses of specific issues including:
    - How the current and proposed policies affect different Producer Groups
    - How the current and proposed policies affect different Processors
    - What are the qualitative and quantitative implications of the various policies to individual Producers and Processors
    - How proposed policies position Montana compared to neighboring States
    - Analyze the flow of dollars through the Pool based on various policies
        - In-State sales
        - Out-of-State bulk shipments
        - Out-of-State packaged shipments
        - Inter-Plant shipments
    - Implications of changing the Montana Differential

Appendix C – Charts and Tables

All Dairy Facilities in Montana Region



Montana – Number of Cows and Dairies – Trend



Source of Data: Montana Board of Milk Control

Herd Size and Distance from Nearest Plant

Source of Data: Montana Milk Control Bureau

The chart above shows the distribution of Pool Producers in terms of the size of their herd and the distance of their farm from their primary processing plant. As can be seen in the chart many Producers with fewer than 200 cows are 100 miles or more from their processing plant, with several as many as 250 miles away. On the other hand, farms with more than 200 cows tend to be much closer to their plant, most are less than 50 miles away with a few exceptions.

Appendix D – References

- Montana Board of Milk Control
- Montana Department of Livestock Milk Control Bureau
  - http://liv.mt.gov/Attached-Agency-Boards/Milk-Control
- The Montana Milk Control Act, ARM 32.23 (repealed) and 32.24.
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- California Department of Food and Agriculture and website
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- California Dairy Statistics Annual – 2017, CA Dept of Food and Agriculture
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- "Seasonality is a Problem for NY Dairy Industry" by Harry M. Kaiser, Department of Agricultural Economics, New York State College of Agriculture and Life Sciences, Cornell University (1988)
- "Evaluation of the Base-Excess Plan for Leveling Seasonal Milk Production: Case Example of Maryland" by Allen M. Prindle, Journal of The Northeastern Agriculture Econ Council. VOL. IX. NO. 1, April 1980
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- Progressive Publishing – “2016 U.S. Dairy Statistics”
- Idaho Department of Agriculture – Idaho Milk and Dairy Statutes
- Pennsylvania Milk Marketing Board – Board milk control
- Utah Department of Agriculture and Food – Dairy Compliance
- South Dakota Department of Agriculture – Dairy and Eggs Department
- Wyoming State Agriculture Department – Consumer Health Services
- Virginia State Milk Commission – Milk control office

Appendix E – Comments Received

In response to the draft report that was issued for public review, we received comments from a number of sources including the Board of Milk Control, Milk Control Bureau, Montana Milk Producers Association, Montana Processors and individual Producers.

Many of the comments related to the data or text that was presented and either suggested corrections, requested additional detail, description or clarification of the draft content, or proposed edits related to formatting and typographical errors. We believe we have addressed all of these comments in the final report.

Certain comments provided feedback or concerns regarding specific recommendations that were made, and they are summarized below to provide perspective. In such cases we reviewed the recommendations in detail and the final report reflects our consideration of the concerns expressed below.

- All comments in regard to the $2.55 Class I Differential were in favor of keeping it at its current amount. This feedback came from Processors as well as Producers

- Strong opposition was expressed for revising the Class III cream price from its current formula to the lower of Federal Order Class III or Class IV. It was expressed this would have a significant impact on Processor profitability by increasing costs that could not be recouped in the market and would create an unfair competitive situation

- Views were expressed both for and against eliminating charging inter-Plant hauling costs to the state-wide Pool. A concern was expressed that there was insufficient analysis or reference to the associated pricing benefit the Pool receives from the milk being sold as Class 1 milk in Montana or as Packaged Surplus to Contiguous states versus potentially receiving a discounted Surplus price if it would otherwise have been shipped out-of-State as raw Bulk milk. This comment referenced other similar situations where the cost side of charges to the Pool should also take into consideration the benefit Pool members receive from how the milk is utilized such that situations are not created whereby certain Pool members no longer share in the cost but receive the benefits

- Views were expressed both for and against restructuring the Pool. The disbandment of the Pool or the creation of two individual Pools should be fully vetted amongst the Producers since it is ultimately their action that is required

- Various comments addressed Quota and Excess. Excess should not be Pooled and the Excess discount should be increased but not to $5.00. Quota is not working, but it should not be reduced. If Quota is reduced it should be at 120% of Class I utilization but should not be done in one shot. If Quota is re-allocated, Producers should be compensated for the value of Quota change

- A comment was made that the $0.50/cwt adjustment for Class I packaged milk sold to noncontiguous markets was agreed to at the time in combination with other parts of the current Pool regulations and that because this was part of a deal it should not be viewed as a stand-alone policy

- Another comment on this issue was that the $0.50/cwt surplus adjustment was not created as an offset to the Pool's absorption of inter-Plant freight. Pooling rules have always provided for the Pool absorbing the inter-Plant freight and the $0.50/cwt adjustment for Class I Packaged sales to Non-Contiguous states came much later

- A concern was expressed that the report inadequately addressed the logistical and marketing activities that are provided at no cost by the Processors in finding markets for Surplus Bulk milk generated by Producers. It was suggested that an evaluation be done to determine whether a credit should be provided to Processors for performing these services