Impacts of Changes in Milk Component Pricing on Dairy Farm Revenue

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Background: Changes to Milk Pricing

Many dairy farmers know that minimum regulated prices for about three-quarters of farm milk produced in the US are set based on formulas administered by Federal Milk Marketing Orders **(FMMO)**. Currently, 11 Orders exist and are defined geographically (Figure 1). After a lengthy administrative process to evaluate the evidence about the need for pricing changes that began in March 2023, in mid-November 2024 the Dairy Division of the USDA released a Final Decision detailing changes to milk pricing under FMMO. In a subsequent producer referendum in December 2024 and January 2025, these changes were approved for all of the current 11 FMMO, and the new milk pricing formulas will become effective in June 2025.

There are multiple changes to the pricing formulas, including:

Increased "make allowances": Make allowances are estimates of manufacturing costs subtracted from a wholesale product price to calculate component values for farm milk. Make allowances will be increased from $0.05 to $0.07 per lb for the four dairy products used to calculate component values (butter, cheddar cheese, dry whey and nonfat dry milk).

Increased Class I differentials: Class I differentials are the amounts paid by fluid processors above a Class III or Class IV milk value for milk used in beverages. Class I differentials are specified for each US county where farm milk is first received for processing. The values of Class I differentials were increased by up to $2.40/cwt in areas of the southeast, with an average nationwide increase of $1.24/cwt (Figure 2).

Changes in milk composition used in formulas: Reported classified milk prices are determined based on component values for butterfat, protein, other solids (Class III milk), and butterfat and nonfat solids (Class IV milk), and a standard milk composition. Reflecting higher solids content in milk, the composition factors for protein will increase from 3.1 to 3.3%, the other solids factor from 5.9 to 6.0%, and nonfat solids from 9 to 9.3%.

Return to the "higher of" Class III and Class IV to calculate Class I prices: In addition to the differentials mentioned above, the Class I price is set based on the values of Class III and Class IV skim milk. The current formulas use the "average of" Class III and Class IV skim milk prices plus $0.74/cwt to set the base Class I skim price. In June, the base Class I skim price will be set as the "higher of" the Class III or Class IV skim price.

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Removing barrel cheese prices from the Class III pricing formulas: The values of components in farm milk are based on the monthly averages of four wholesale product prices as reported by USDA. Beginning in June, only the prices of 40-lb blocks (and not 500-lb barrels) will be used to calculate the protein value for milk used to make cheese.

Provisions for Pricing Extended Shelf Life (ESL) milk: ESL milk is heated to a higher temperature, resulting in longer shelf-life of 65 to 120 days,ilk market is ESL. The new formulas that become effective in June will adjust the Class I price for milk used in ESL adjustment equal to the difference between the higher-of and average-of plus a 24-month rolling adjuster with a 12-month lag.

Impacts of Price Formula Changes on Farm Milk Prices

Given the numerous changes that will occur in June, what are the likely impacts on farm milk prices when the new pricing rules begin? The largest potential impacts of the price changes will likely result from changes to the make allowances and the Class I differentials (Table 1). Increases in the make allowances will mean that component values in June will be lower with the new formulas, which could lower pay prices to producers in orders with pricing based on components. In the four FMMO that use butterfat-skim pricing, lower values of components will be offset to some extent by the changes in milk composition. Changes to the Class I differentials will increase the value of Class I milk in all orders, contributing to higher values of pooled milk and Producer Price Differentials **(PPD)**. Increases in prices paid for farm milk due to the proposed changes in Class I pricing will be larger in regions with larger increases in location-specific differential values and higher utilization of Class I milk (such as the southeastern US).

Impacts on component values and reported Class prices may not always reflect the likely impact on farm milk prices. Farms pooling milk and receiving the full regulated minimum Class III price would see reductions in component values ranging from about $0.07/lb for butterfat to $0.10/lb for protein (Table 2). The corresponding classified milk prices will be lower due to make allowance changes by about $0.50/cwt and component values lower by about $1.00/cwt. However, not all milk is pooled, and some pooled milk may receive less than the minimum regulated price due to deductions by cooperatives. For those farms, any price decreases will likely be smaller than those based on reported prices or component values—and pay prices for some producers could actually be higher. Similarly, impacts on Class I prices and PPD will vary by Order. For example, increases in Class I differential values are similar in the Upper Midwest, Mideast, and Florida orders, but the impact on farm milk prices will be larger in Florida due to a higher proportion of Class I milk (Table 3).

The changes to the formulas imply lower values for components and minimum regulated prices for milk used in manufacturing for given values of wholesale product prices (butter, cheese, dry whey, and nonfat dry milk). However, these product prices are likely to be affected in the future by changes to the production of, and demand for, farm milk given the changes to the pricing formulas. We would expect that any reduction in component values and farm milk prices will result in different production decisions by dairy farms (less milk and components produced) and purchase decisions by dairy plants (more milk and components purchased). Thus, the farm milk prices beginning in June will affect future production and the demand for farm milk. Dynamic economic modeling (Nicholson and Stephenson, 2024) of these potential impacts indicates that any initial price decreases will result in somewhat lower milk production in the next couple of years, which in the future will affect the supply-demand balance for farm milk and mitigate some impacts of the changes that begin in June (Figure 3). We project that over the next five years, the impact on the average All-milk price in the US will be about $0.07/cwt lower than it would have been without the changes (including estimated changes to over-order premium payments).

Implications and Potential Feeding Strategy Responses

Producers whose milk is pooled and who have received full component values for milk will initially see lower component values going forward, which may imply that adjustments to feeding strategy are appropriate. Staying in communication with milk buyers and monitoring the evolution of component pricing going forward will be helpful for making other management adjustments to the new pricing environment.

Although (initially) lower component values may suggest that feeding strategies might be adjusted, a longer-term perspective is useful, particularly for butterfat values. The average butterfat test of US farm milk has increased considerably in the past 15 years, from 3.8% to over 4.4% (Figure 4). The increase has been more rapid in recent years and is typically attributed to a combination of improved feeding (ration formulation, forage quality, and feed bunk management) and genetic selection for milkfat production (Bonhart, 2024). US butter production has increased over time but has not kept pace with the growth in demand (O'Leary, 2025), resulting in gradually increasing butter prices and the value of butterfat in milk (Figure 4). The share of US nonfat components exported also has increased over time, although the future trajectory may be affected by the administration's current trade policy actions (Nicholson, 2025).

Dairy nutritionists also have been paying more attention to fat in the ration in recent years. Previous work (Nicholson et al., 2024) identified economic benefits from the inclusion of high-oleic soybeans **(HOSB)** in dairy rations, based on assumptions about the likely biological response (rather than data from specific feeding trials). This previous work did not assess the economic impacts of different levels of HOSB in diets or the form of the HOSB (e.g., raw versus roasted). Recent studies (Bales and Lock, 2024a; 2024b) documented the impact of feeding HOSB on the yields of milk and milk component production of post-peak, high-producing dairy cows. The first of these studies documented the effects of increasing the inclusion of roasted and ground HOSB from 0 to 24% diet DM, which increased preformed milk fatty acid yield. The second study evaluated the effect of raw versus roasted ground HOSB at 16% diet DM, finding that any HOSB inclusion increased DMI, yields of milk, milkfat, milk protein, and lactose production, but production responses were larger with the use of roasted HOSB. The biological responses to HOSB feeding in these trials were larger than those assumed in the previous economic analyses by Nicholson et al. (2024).

Research currently in progress (Nicholson et al., 2025) examines the impact on Income Over Feed Cost **(IOFC)** using data from the two experiments reported by Bales and Lock (2024ab) using data on milk component values and feed costs for January 2014 to December 2024 to account for relevant variation in IOFC impacts over time. Different assumptions about HOSB costs (own production versus purchase at various assumed premiums and transportation costs) account for farm-specific differences in HOSB sourcing situations. Feeding HOSB in dairy rations up to 24% of DM would have increased the mean value of IOFC by amounts up to $1.06 cow/day for HOSB valued at production costs and $0.71 cow/day for purchased HOSB, including price premiums, transportation, and roasting costs (Figure 5). However, for some months during the study period, inclusion of HOSB at 16% and 24% would have resulted in lower IOFC than for the control with 0% HOSB. Feeding roasted HOSB at 16% of DM would have increased mean IOFC/cow/day from January 2014 to December 2024 for any assumed values of HOSB and transportation costs, from $1.70/cow/day at production cost to $1.06/cow/day for the highest HOSB price premium and including roasting and transportation costs (Figure 6). In contrast, feeding raw HOSB with or without bypass protein would increase IOFC only when HOSB was valued at farm production cost, or at the lowest possible HOSB price premium without transportation costs. The estimated positive impacts on IOFC feeding HOSB under more favorable economic scenarios (e.g., at HOSB production costs) are larger than previous studies due to higher inclusion of HOSB as a proportion of diet DM. Future work can compare impacts on IOFC for other than high-production, mid-lactation cows, and for the substitution of other dietary ingredients, including other sources of oleic acid.

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Table 1. Summary of changes to milk pricing formulas under FMMO and their likely farm milk price impacts.

Change to Pricing Formulas	Likely Farm Milk Impacts
Increased make allowances	Reduced values of reported Class and component values, but overall farm milk price impacts less clear because some milk is not pooled and other pooled milk has deductions.
Increased Class I differentials	Modest increases in Producer Price Differentials **(PPD)** and pay prices for pooled farm milk, with larger increases for Orders with more Class I milk.
Change in milk composition for reported Class prices	Limited impacts on component values or pay prices, except in Orders with Skim-Butterfat pricing, where it will offset make allowance increases to some extent.
Remove cheddar cheese barrels from surveyed milk price	Modest impacts on average Class III component values, but less variability in protein component values.
"Higher of" rather than "Average of" + $0.74/cwt	Modest impacts on PPD values and "blend" prices for pooled milk.
Adjustments to ESL milk pricing	Limited impacts on average PPD values or "blend prices" over a number of years.

Table 2. Impacts of changes in make allowances on component values and minimum regulated milk prices based on product prices from December 2024.

Milk or Component Value	Impact of the Changes in Make Allowances	Comment
Class III Price (Reported value), $/cwt	-0.53	Includes changes to make allowances and composition
Class III Butterfat Price, $/lb	-0.0675	Lower butterfat price for same butter price
Class III Protein Price, $/lb	-0.0985	Lower protein price for the same cheese price
Class III Other Solids Price, $/lb	-0.0697	Lower other solids price for the same dry whey price
Class III Components (Pool value at component test), $/cwt	-1.05	Sum of component values at actual test
Class IV Price (Reported value)	-0.52	Includes changes to make allowances and composition
Class IV Butterfat Price, $/lb	-0.0675	Lower butterfat price for same butter price
Class IV Nonfat Solids Price, $/lb	-0.0708	Lower nonfat solids price for the same nonfat dry milk price
Class IV Components (Pool value at component test), $/cwt	-0.95	Sum of component values at actual test
Milk not currently pooled	Not Known	Could increase if premiums return or milk is pooled
Milk currently pooled by a cooperative but with re-blending (deducts)	Not Known	May not change very much if current pay prices account for cooperative costs

Table 3. Impacts of changes in Class I differentials on minimum regulated farm milk blend prices.

Calculation of Class I Differential Component	Marketing Order: Upper Midwest	Mideast	Florida
Average Change in Class I Differential, $/cwt	1.40	1.70	1.40
Average Change in Class I Differential Accounting for Changes in Class I Skim Value due to Other Changes[a], $/cwt	0.76	1.06	0.76
Class I Utilization (%)[b]	6%	36%	82%
Estimated Impact on the Blend Pricec, $/cwt	0.05	0.38	0.62

[a]The estimated impact on Class I Base Skim Milk Price used to set the Class I price is -$0.64/cwt based on simulation modeling of combined FMMO changes. This is subtracted from the change in Class I differential to report this value.
[b]Percentage of pooled milk in Class I in 2023.
[c]Change in Class I differential with skim value changes times average utilization.

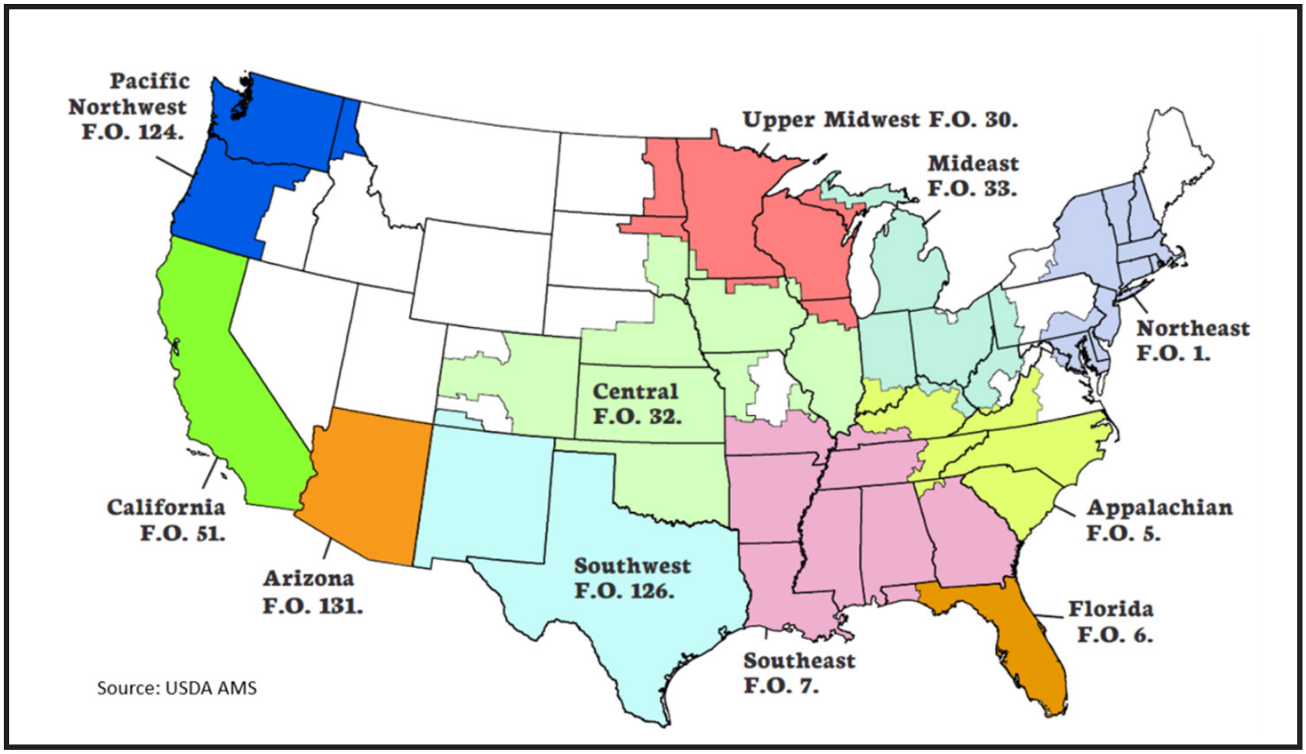

Figure 1. Marketing Areas for the 11 Current Federal Milk Marketing Orders.
Source: https://www.ams.usda.gov/sites/default/files/media/Federal%20Milk%20Marketing%20Orders%20Map.pdf

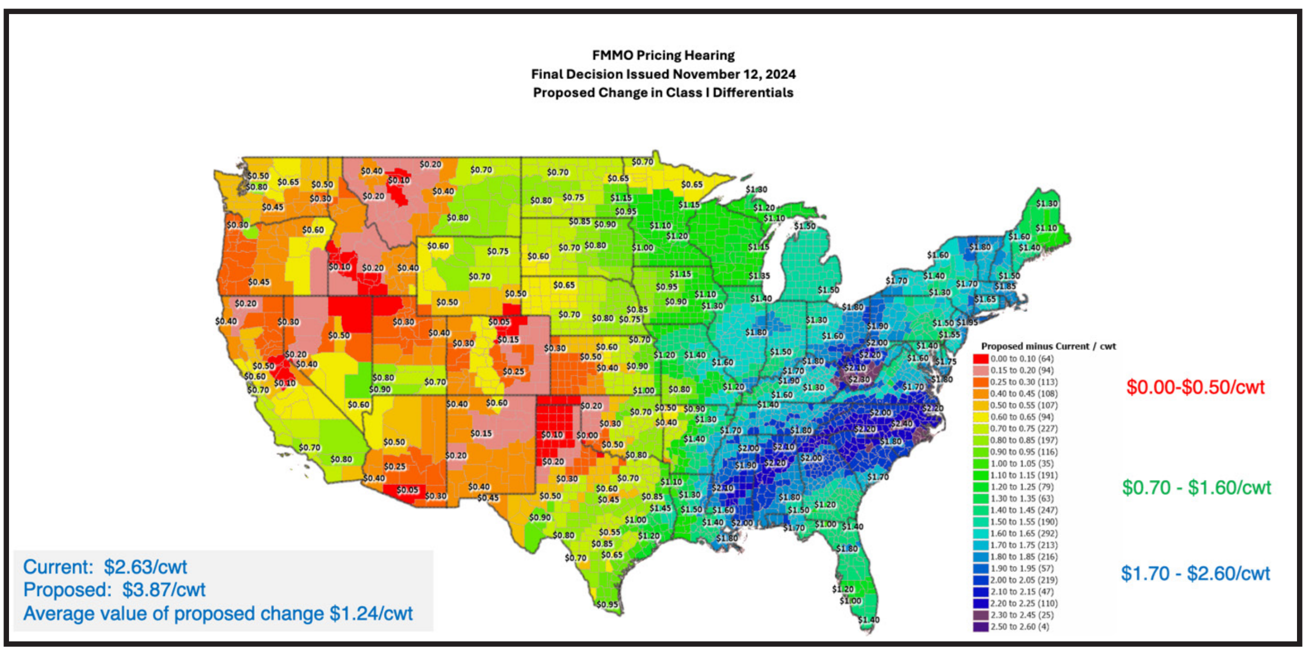

Figure 2. Changes to Class I Differentials by County in USDA's Final Decision.
Source: https://www.ams.usda.gov/sites/default/files/media/DairyFMMO_ProposedChangeInClassIDifferentialsMap.pdf

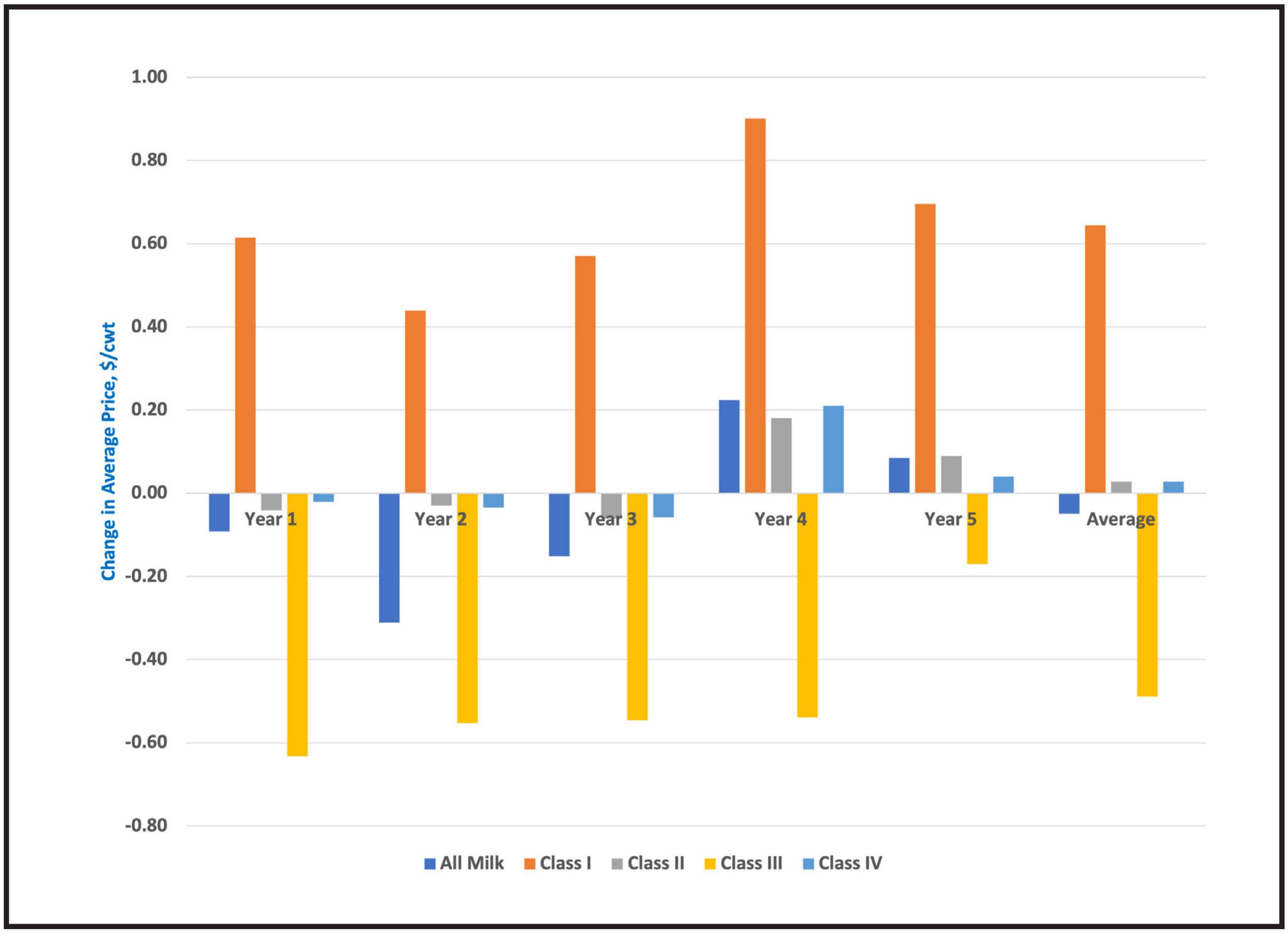

Figure 3. Simulated Differences in Class Prices and the US All Milk Price After Implementation of Changes to Pricing Formulas, Accounting for Change to the Supply and Demand Balance for Milk (Nicholson and Stephenson, 2024).

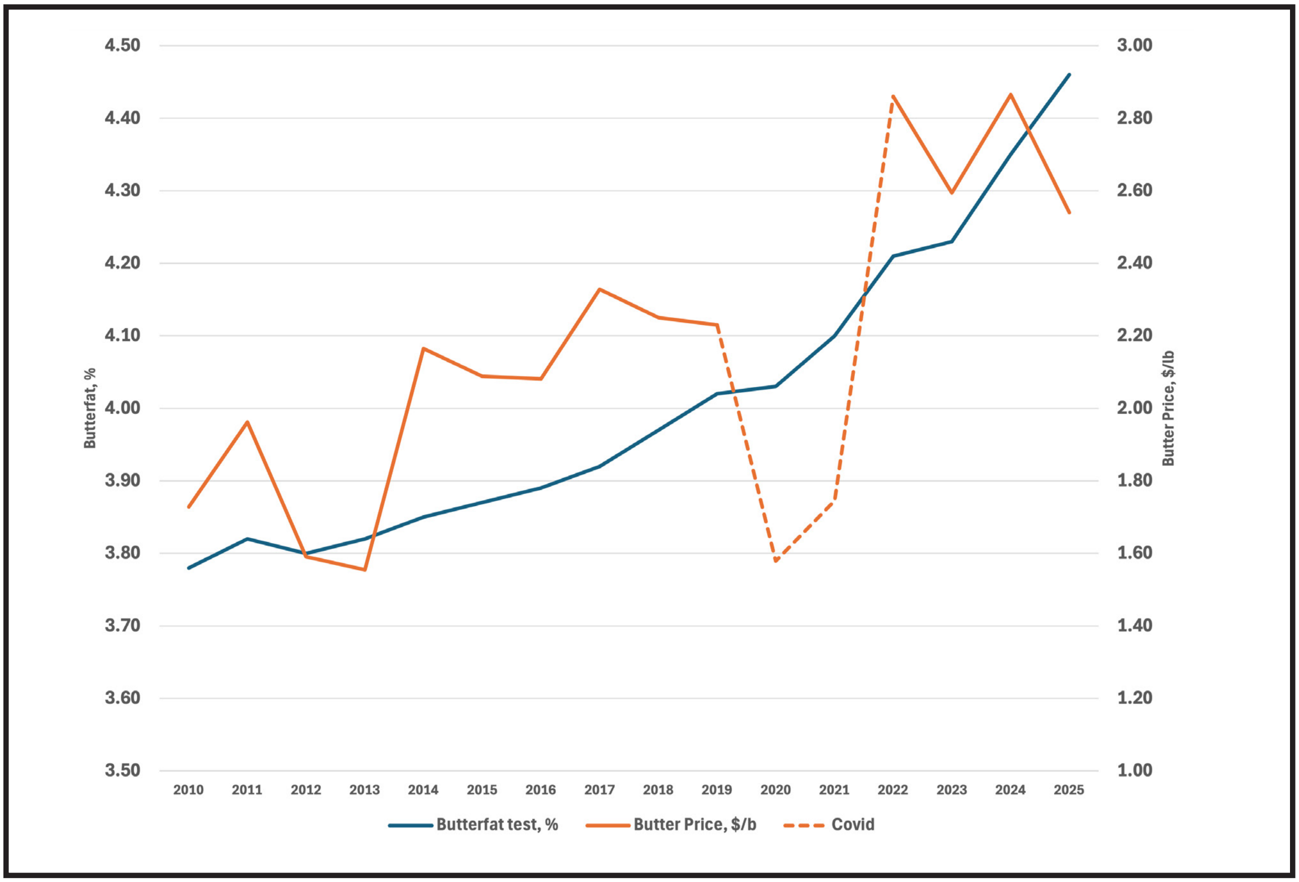

Figure 4. Average US Butterfat Test in Farm Milk (January) and Wholesale Butter Prices, 2010 to 2025 (Source: USDA Agricultural Marketing Service and USDA National Agricultural Statistics Service)

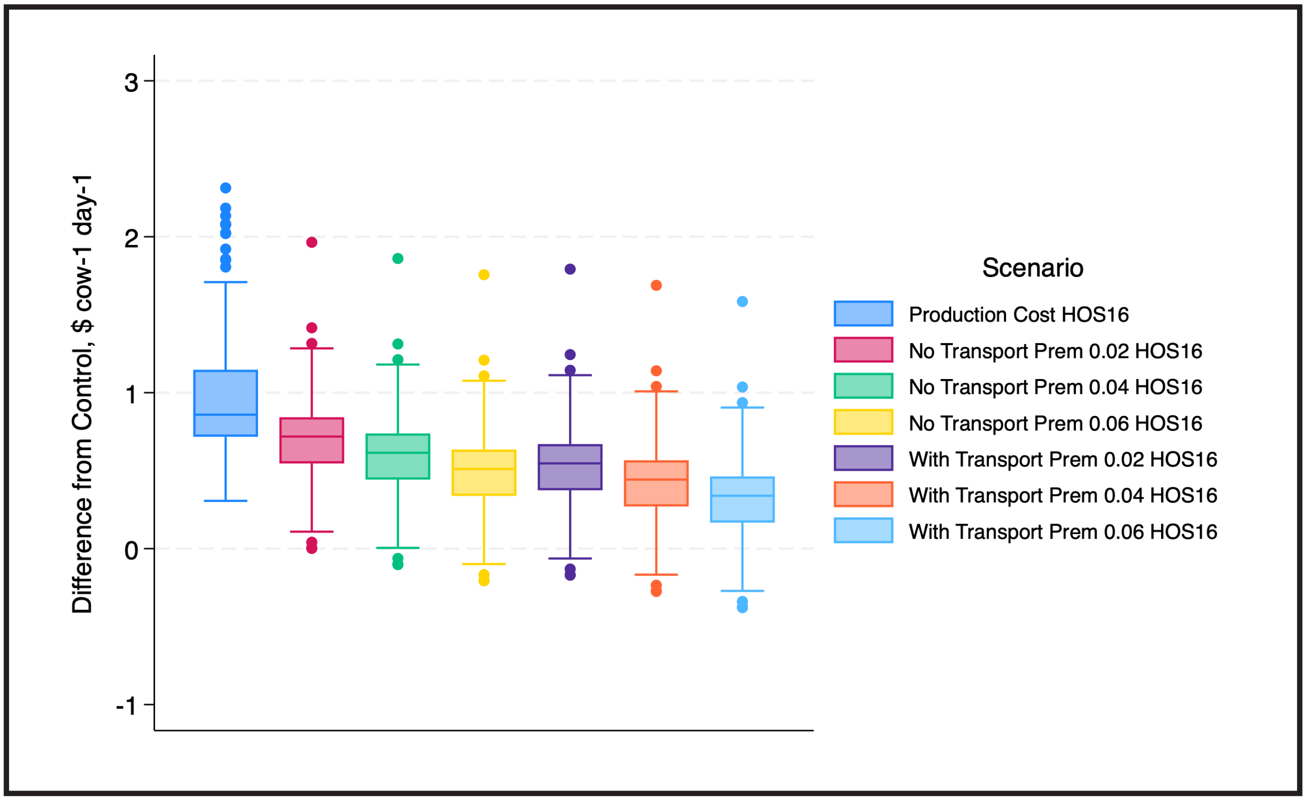

Figure 5. Box and Whiskers plots of income over feed costs (IOFC) distributions for inclusion of high oleic soybeans (HOSB) at 16% of dietary dry matter (DM), seven scenarios with assumed HOSB cost, premium and transportation costs (Nicholson et al., 2025).

Legend Notes:

No Transport = no transportation costs included in HOSB acquisition cost
With Transport = includes transportation costs included in HOSB acquisition cost
Prem 0.02 = $0.02/kg price premium for purchased HOSB
Prem 0.04 = $0.04/kg price premium for purchased HOSB
Prem 0.06 = $0.06/kg price premium for purchased HOSB
HOSB8 = 8% HOSB inclusion rate
HOSB16 = 16% HOSB inclusion rate

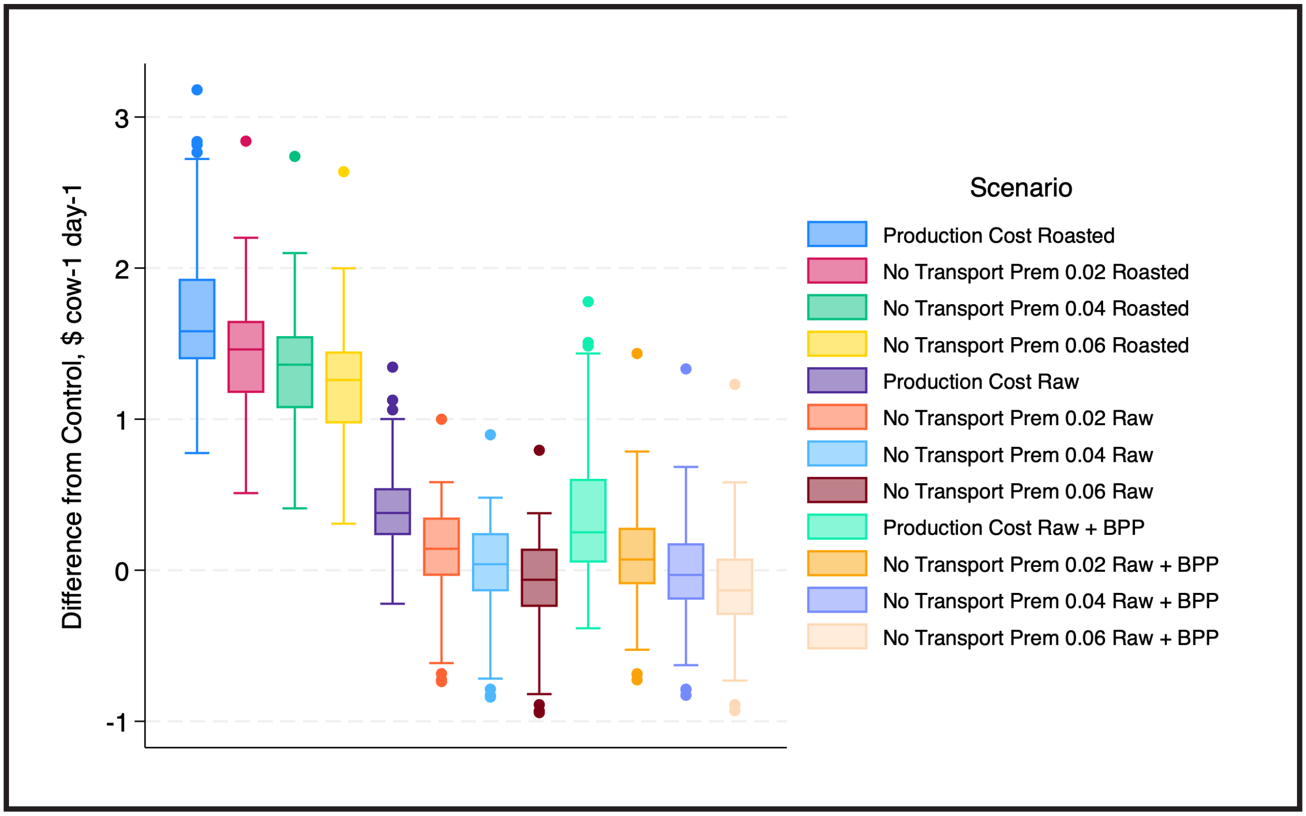

Figure 6. Box and Whiskers plots of income over feed costs (IOFC) distributions for scenarios with production cost and no transportation costs for roasted, raw and raw + bypass protein diets no transport = no transportation costs included in high oleic soybean (HOSB) acquisition cost (Nicholson et al., 2025)

Legend Notes:

With Transport = includes transportation costs included in HOSB acquisition cost
Prem 0.02 = $0.02/kg price premium for purchased HOSB
Prem 0.04 = $0.04/kg price premium for purchased HOSB
Prem 0.06 = $0.06/kg price premium for purchased HOSB
Roasted = Roasted HOSB included in diet
Raw = Raw HOSB included in diet
Raw + BPP = Raw HOSB and bypass protein included in diet