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Organic Dairy Margin Coverage: Is the application feasible?

Christopher A. Wolf

Charles H. Dyson School of Applied Economics and Management SC
Johnson College of Business
College of Agriculture and Life Sciences
Cornell University, Ithaca, NY 14853-7801

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2022 was a profitable year for most dairy farms in the US with record high (nominal) milk prices which exceeded increasing feed costs. An exception was organic milk production which was largely not profitable at the farm level because of extraordinarily high organic feed prices. Organic dairy farms in the US have often struggled in recent years to maintain market share and generate profits. One result has been a recent assistance program (Organic Market Assistance Program) but these *ad hoc* programs cannot—and should not—be relied upon to consistently provide effective risk management for organic dairy farms.

The Dairy Margin Coverage Program (DMC) is a risk management program for dairy farmers. On an annual basis dairy farmers may sign up for covering an operation-specific amount of milk production history using nationally representative income over feed cost margin of up to \$9.50 per hundredweight for a relatively small fee. DMC has become the foundation of market risk management by US dairy farms—particularly for small and medium-sized herds. Since 2018, a majority of dairy farms and eligible milk production have participated as the program has become foundational to dairy farm risk management.

DMC does not specify or differentiate between conventional or organic milk production. As such, organic dairy farms are eligible to participate and many of them do. However, the prices that are used to determine the margin and trigger payments are for conventional milk and feed. Thus, the DMC measure of profit may or may not be a reasonable facsimile for organic dairy farms.

This research considers the feasibility and utility of the DMC program for organic dairy farms. In particular, we examine the income over feed cost risk for conventional and organic dairy farms and assess the potential for an organic-specific program. In order to accomplish this objective this paper: reviews the history and mechanics of DMC; compares conventional and organic milk and feed prices along with the resulting margin; examines data and informational challenges; and considers way forward for organic milk production risk management.

Mechanics of the Dairy Margin Coverage Program

The antecedent of the Dairy Margin Coverage (DMC) Program was the Margin Protection Program for dairy (MPP) that originated in the 2014 Farm Bill. MPP was a voluntary risk management program for dairy farmers authorized through Dec. 31, 2018. The 2018 Farm Bill renamed the current Margin Protection Program for Dairy Producers (MPP-Dairy) the Dairy Margin Coverage Program and authorized the program through December 31, 2023, with an effective date of January 1, 2019. DMC provides dairy operations with risk management coverage that will pay producers when the difference (the margin) between the national price of milk and the average cost of feed falls below a level selected by the program participants from an available range.

DMC uses as a payment trigger the U.S. income-over-feed-cost based off of national average monthly prices rather than farm specifics. This margin, named the Actual Dairy Production Margin (ADPM), approximates the milk revenue over all feed costs on the farm. The ADPM is defined as:

$$\text{ADPM (\$/cwt)} = \text{U.S. All-Milk Price (\$/cwt)} - \text{Feed Cost Index (\$/cwt)}$$

where:

$$\text{Feed Cost Index} = 1.0728 \times \text{NASS US Corn Price (\$/bu)} + 0.00735 \times \text{AMS}$$

$$\text{Soybean Meal (Central IL) (\$/ton)} + 0.0137 \times \text{NASS US Alfalfa Hay (\$/ton)}.$$

The All Milk price represents the gross price farmers received in the given month per hundredweight (cwt) of milk sold at average fat test (i.e., not standardized to, for example, 3.5% butterfat as FMMO Class prices are). As a gross price, the All Milk price does not deduct items such as hauling and stop charges, advertising and promotion costs, and coop dues. The All Milk price also does not include hauling subsidies, but does include premiums and discounts for quality, quantity, or other reasons. Each month, the US Department of Agriculture's National Agricultural Statistics Service (NASS) estimates the All Milk price for each of the major milk-producing states and a national average (USDA-NASS, 2023). In establishing state All Milk prices each month, NASS uses administrative data from various sources as well as survey data. All Milk prices are reported monthly in the *Agricultural Prices* publication. DMC uses the US All Milk price.

The feed cost index was created in consultation with dairy nutritionists but was ultimately tweaked a bit based on program cost considerations. Ultimately, the prices were weighted based on the following feed ration per hundredweight of milk:

- 30 pounds of shelled corn,
- 106.4 pounds of corn silage,
- 14.7 pounds of soybean meal,
- 27.4 pounds of alfalfa hay.

The specific prices used include the USDA National Agricultural Statistics Service (NASS) corn price received, NASS supreme alfalfa hay price, and USDA Agricultural Marketing (AMS) Central Illinois soybean meal price.

The 2018 Farm Bill required the collection of premium and supreme alfalfa hay prices. USDA regulations are adopting a revision of the alfalfa hay price to include high quality alfalfa in the National average feed cost calculation. For a period under the DMC program, the premium and supreme alfalfa hay prices as reported by NASS will be used in a 50 percent blend with 50 percent of the non-premium alfalfa hay prices that were previously used in MPP-Dairy. More recently the feed cost index has used the premium alfalfa price that NASS has begun collecting.

Including the higher priced alfalfa hay increased the feed cost and triggered larger indemnity payments.

Under the original MPP, the margins that could be covered varied between \$4 and \$8/cwt with an effective annual production history coverage cap of four million pounds. The DMC increased the Tier 1 quantity to five million pounds annually. While it is technically correct that any amount of milk production associated with the farm’s historic base can be covered, the DMC is effectively capped at the Tier 1 level as the Tier 2 premiums for reasonable margins are prohibitively expensive. Those operations that do elect to cover production history beyond five million pounds often do so at the \$4/cwt margin which is free (but also has never triggered a payment).

Table 1. Dairy Margin Coverage Program Coverage and Premiums

Coverage Level	Tier 1	Tier 2
	Premium for covered production history ≤ 5 mil lbs.	Premium for covered production history > 5 mil lbs.
	\$/cwt	
\$4.00	None	None
\$4.50	\$0.0025	\$0.0025
\$5.00	\$0.005	\$0.005
\$5.50	\$0.030	\$0.100
\$6.00	\$0.050	\$0.310
\$6.50	\$0.070	\$0.650
\$7.00	\$0.080	\$1.107
\$7.50	\$0.090	\$1.413
\$8.00	\$0.100	\$1.813
\$8.50	\$0.105	N/A
\$9.00	\$0.110	N/A
\$9.50	\$0.150	N/A

Source: USDA FSA, Dairy Margin Coverage Fact Sheet

All types of dairy operations in the United States are eligible for the DMC program. Each producer on the operation must share in the risk of producing milk and make contributions (including land, labor, management, equipment, or capital) to the operation of the dairy that are at least equal to the individual or entity’s share of the proceeds of the operation. An eligible dairy operation must:

- have a production history determined by the USDA Farm Service Agency (FSA),
- be registered to participate during a signup announced by FSA,
- pay a \$100 administrative fee annually for each year of participation, except if the dairy operation qualifies for a waiver for limited resource, beginning, socially disadvantaged, or veteran farmers and ranchers,

- select a coverage level ranging from \$4.00 to \$9.50 per hundredweight in \$0.50 increments, and
- select a coverage percentage of the dairy operation’s production history ranging from 5 percent to 95 percent, in 5 percent increments.

Program performance

The ADPM reflects a margin where producers are in the cash market for feed prices. As some of the feeds are either homegrown or contracted in advance on most dairy farms, these prices represent an opportunity cost of feed. With milk being the largest source of revenue and feed being the largest cost of production, it should not be surprising that the income over feed cost a reasonable proxy for dairy farm profitability. Past research found this margin to be the case for dairy farms (Wolf, 2010 and Wolf et al., 2014).

The ADPM is a proxy for dairy farm profitability as well as the trigger for Dairy Margin Coverage payments. The average ADPM from 2000 through 2022 was \$8.75/cwt. (Figure 1). Historically, about three-quarters of the variation in IOFC has been driven by the milk price. Rate of return on assets (ROA) is a measure of profitability calculated as operating profit divided by the value of farm assets. As figure 1 demonstrates, the ADPM is highly correlated with dairy farm profitability (correlation coefficient 0.8).



Figure 1. DMC ADPM and New York Dairy Farm ROA, 2000-2022

Organic Milk Production

Organic milk production is certified through the US Department of Agriculture. Achieving organic status requires a significant investment through a three-year transition period. There are many practices required or prohibited for organic milk production relative to conventional. Perhaps the most important are: organic dairy farms must feed only organically certified feed (no GMO crops, chemical fertilizers or pesticides); organic farms are prohibited from using antibiotics; and organic dairy cows must receive at least 30 percent of their forage intake from pasture (120 days of pasture access or entire growing season) (USDA).

Organic milk production has grown into a significant niche market particularly for beverage milk, yogurt and ice cream. USDA and Mercaris report different numbers of farms, cows and quantities of organic milk production. USDA reports an “organic census” every couple of years with the most recent being 2021 data released in 2022. Mercaris uses different methods to estimate the amount of organic farms and milk in many cases their methods result in higher values than the USDA estimates.

Table 2 displays the estimates for 2021 of the number of organic dairy farms as well as the USDA value for total licensed operations which is a best estimate of the total number of conventional and organic dairy farms combined. The two estimates agree that New York and Wisconsin have the highest number of organic farms constituting 15-23 percent of all New York operations and 6-9 percent of Wisconsin operations. Indiana and Vermont also have very large percentages of all dairy farms as organic. For the US, the estimates are that 8.5 to 12 percent of all licensed dairy farms were organic in 2021. The Mercaris estimate of organic dairy farms is almost 50 percent larger than the USDA estimate.

Table 2. Number of organic and total dairy farm operations, 2021

State	USDA Estimate	Mercaris Estimate	Total Licensed Dairy Farms	% Organic Dairy Farms Estimate	
				low	high
New York	516	786	3,430	15.0	22.9
Wisconsin	415	590	6,770	6.1	8.7
Pennsylvania	357	486	5,200	6.9	9.3
Indiana	207	281	580	35.7	48.4
Ohio	216	262	1,620	13.3	16.2
Vermont	156	209	770	20.3	27.1
Minnesota	104	163	2,215	4.7	7.4
California	99	153	1,175	8.4	13.0
Iowa	58	126	880	6.6	14.3
Michigan	44	104	1,140	3.9	9.1
U.S. Total	2,528	3,606	29,842	8.5	12.1

Data Sources: USDA-NASS Organic Production; Mercaris; USDA Milk Production.

Table 3 displays the estimates for organic milk production by state. Texas produces the most organic milk according to the USDA while California is the top milk producing state by Mercaris' estimates. The difference in California milk production between the two sources is particularly striking but still only constituted two to five percent of the state's milk production. In percentage terms, Oregon had the highest percentage of organic milk production in 2021. Wisconsin organic milk production was less than two percent of the state's total even though 6-8 percent of farms were organic reflecting the small herd sizes of the organic farms. USDA does not estimate Colorado's organic milk production because there were too few farms relative to confidentiality requirements. In total, organic milk production constituted 2 to 4 percent of total milk produced in 2021. Similar to the discrepancy in organic farm estimates, the Mercaris estimate of total organic milk produced is approximately 50 percent larger than the USDA estimate. Clearly, both estimates indicate that organic dairy farms are a significant number of total US dairy farms.

Table 3. Quantity and share of organic milk production, 2021

State	USDA	Mercaris	Total Milk	% Organic Milk	
	Estimate	Estimate	Production	Estimate	
	thousand lbs		million lbs	low	high
California	827,211	2,112,499	41,864	2.0	5.0
Texas	1,015,248	1,339,753	15,599	6.5	8.6
Oregon	354,694	653,734	2,622	13.5	24.9
Idaho	367,753	581,391	16,412	2.2	3.5
Wisconsin	359,800	602,634	31,702	1.1	1.9
New York	409,050	476,575	15,540	2.6	3.1
Pennsylvania	230,214	475,366	10,114	2.3	4.7
Colorado	NA	390,947	5,271	NA	7.4
Minnesota	139,729	234,829	10,458	1.3	2.2
Vermont	187,491	226,838	2,566	7.3	8.8
U.S. Total	5,196,492	8,392,198	226,258	2.3	3.7

Data Sources: USDA-NASS Organic Production; Mercaris; USDA Milk Production.

Organic Income Over Feed Cost Margin

Calculating the income over feed cost margin for organic dairy farms requires prices that have not consistently been collected and reported. USDA-NASS reports a limited number of organic feed prices but have only done so for a few years. Mercaris is a company that was created to provide “up-to-date, accurate information on market conditions for organic and non-GMO commodities.” Mercaris collects organic prices using different methods than the USDA and, as revealed by the estimates of organic milk production in the previous section, the results may

differ. In this section we consider the patterns, correlations and implied basis differences between the USDA organic, Mercaris organic and USDA conventional feed and milk prices that are available. Understanding these patterns is required to evaluate the potential and role of a program to assist organic dairy farmer risk management.

Corn

The conventional corn market is a very large international market where dairy farmers are price takers. Conventional cash corn pricing uses the Chicago Board of Trade price and adjusts for local conditions using a basis. USDA-NASS reports a price received for conventional corn monthly. This price is reported for many states but the US average price received by farms is used for DMC. With respect to organic corn prices, USDA has been reporting them for the past few years. Mercaris reports an organic yellow corn price.¹

Table 4 displays summary statistics for conventional and organic prices (in nominal terms) since January 2013. Conventional corn over the decade averaged \$4.42/bu with a standard deviation of \$1.32. USDA reported an average organic corn price of \$9.76/bu while Mercaris reported \$10.44/bu. The resulting implied organic premium was \$5.25/bu (USDA) and \$6.02/bu (Mercaris).

The coefficient of variation (CV) is a measure of relative variation calculated as the standard deviation divided by the mean. Using the CV, the conventional corn price was relatively more volatile than the organic corn price. The standard deviation for organic corn price was about 50 percent larger in absolute terms than that of conventional corn. However, relative to the mean values, organic corn volatility was about two-thirds that of conventional corn price.

Table 4. Corn price summary statistics, 2013-March 2023

	USDA organic corn price	Mercaris organic corn price	USDA conventional corn price	USDA organic premium	Mercaris organic premium
			\$/bu		
Average	9.76	10.44	4.42	5.25	6.02
Standard Deviation	1.95	2.03	1.32	1.93	1.83
Coefficient of Variation	0.20	0.19	0.30	0.37	0.30

Data sources: USDA-NASS and Mercaris

¹ Mercaris corn price is for “Organic Yellow Corn --Food Grade USDA National Organic Program (NOP) or NOP-equivalent certified, grades generally accepted as USDA U.S. No. 1 Corn (greater than or equal to 56lb TW, less than or equal to 0.1% Heat, less than or equal to 3% Damage, less than 2% FM) --Feed Grade USDA National Organic Program (NOP) or NOP-equivalent certified, grades generally accepted as USDA U.S. No. 2 Corn (greater than or equal to 54lb TW, less than or equal to 0.2% Heat, less than or equal to 5% Damage, less than or equal to 3% FM)” (Mercaris, 2023).

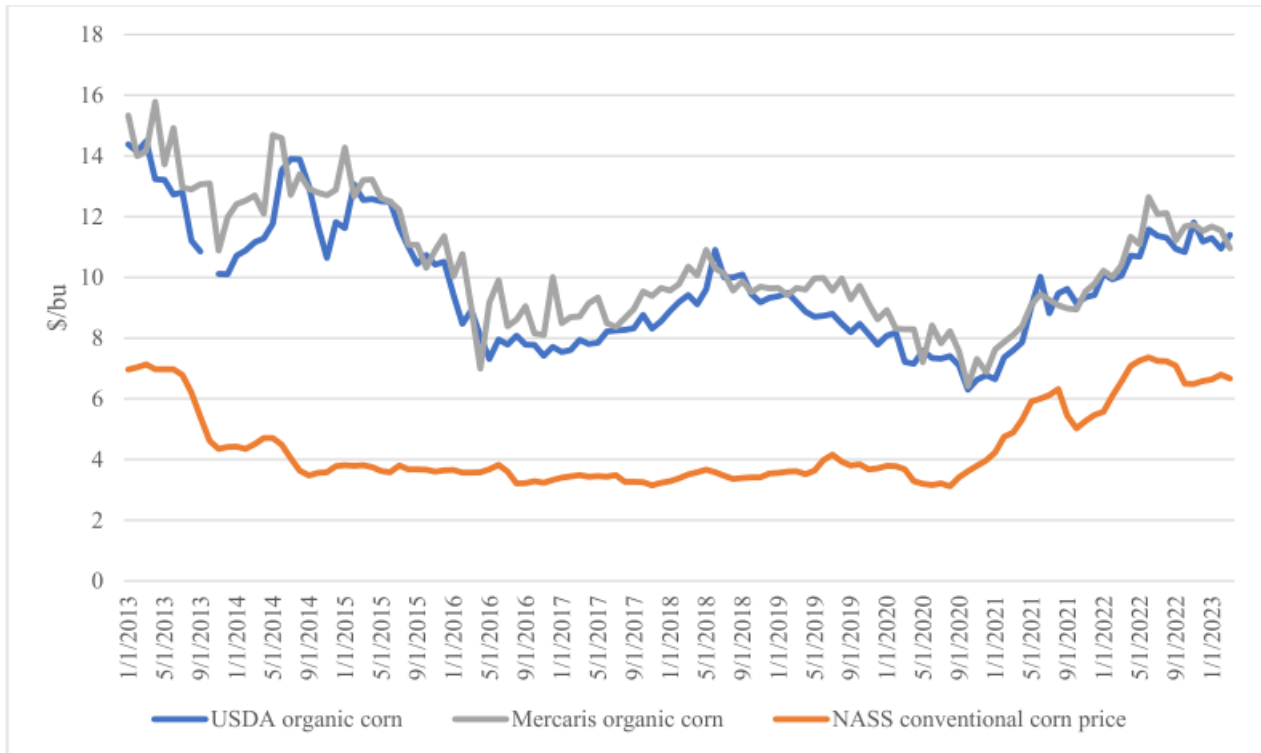


Figure 2. Corn Prices, 2013-March 2023

Figure 2 displays organic and conventional US corn prices since January 2013. Conventional corn was expensive in 2013, 2021 and 2022 related. The same general trends occurred in organic corn prices.

The USDA and Mercaris organic corn prices were more than 90 percent correlated (Table 5). Meanwhile the conventional corn price was 47 to 50 percent correlated. Relative price changes depend on national and international supply and demand factors.

Table 5. Corn Price Correlations, 2013-March 2023

	Mercaris organic corn price	USDA organic corn price
USDA organic corn price	0.91	
USDA conventional corn price	0.47	0.52

Organic and conventional corn prices converged in the past couple of years—shrinking the organic premium—as conventional corn prices increased more quickly than organic corn prices (Figure 3). This was due to supply and demand issues related to the pandemic, recovery and

inflation related to those issues as well as the Russian invasion of Ukraine. Conventional corn supply has a history of responding quickly to higher prices which may increase the organic premium back to more normal levels depending on weather and input costs.

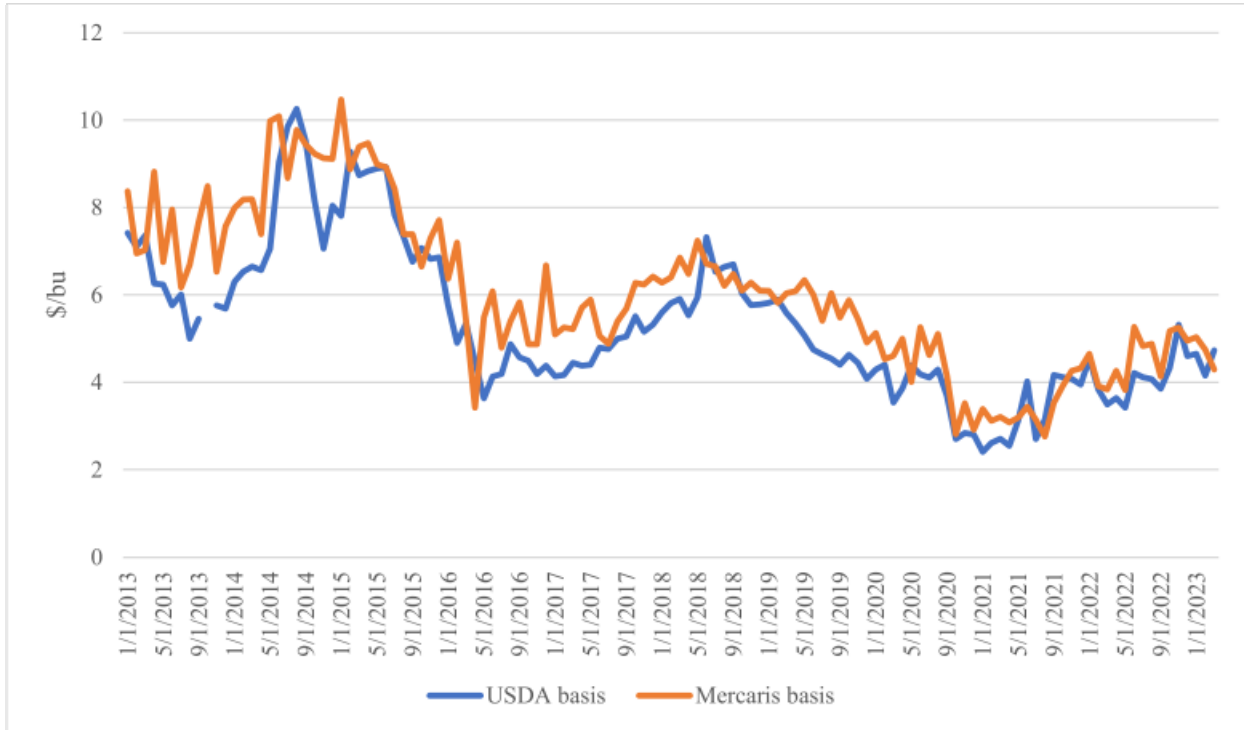


Figure 3. USDA and Mercaris organic corn price premiums, 2013-March 2023

Soybeans

Dairy cow diets require energy, protein and forages. Corn is the primary feed source for energy and hay or silage provides forages. In terms of protein, there are many feeds and by-products that may be used. Conventional dairy farms have many feed sources to choose from including by-products such as cottonseed. The most common protein source is soybean meal whose price is highly correlated with other protein sources. For organic dairy farms there are many less options in terms of organically certified feedstuffs.

USDA reports an organic soybean price monthly. The DMC uses soybean meal price from USDA-AMS because there does not exist a monthly farm price received for soybean meal (farms do not generally sell soybean meal—instead they sell raw soybeans). USDA sporadically reports

an organic soybean meal price while Mercaris more dependably reports an organic soybean price.²

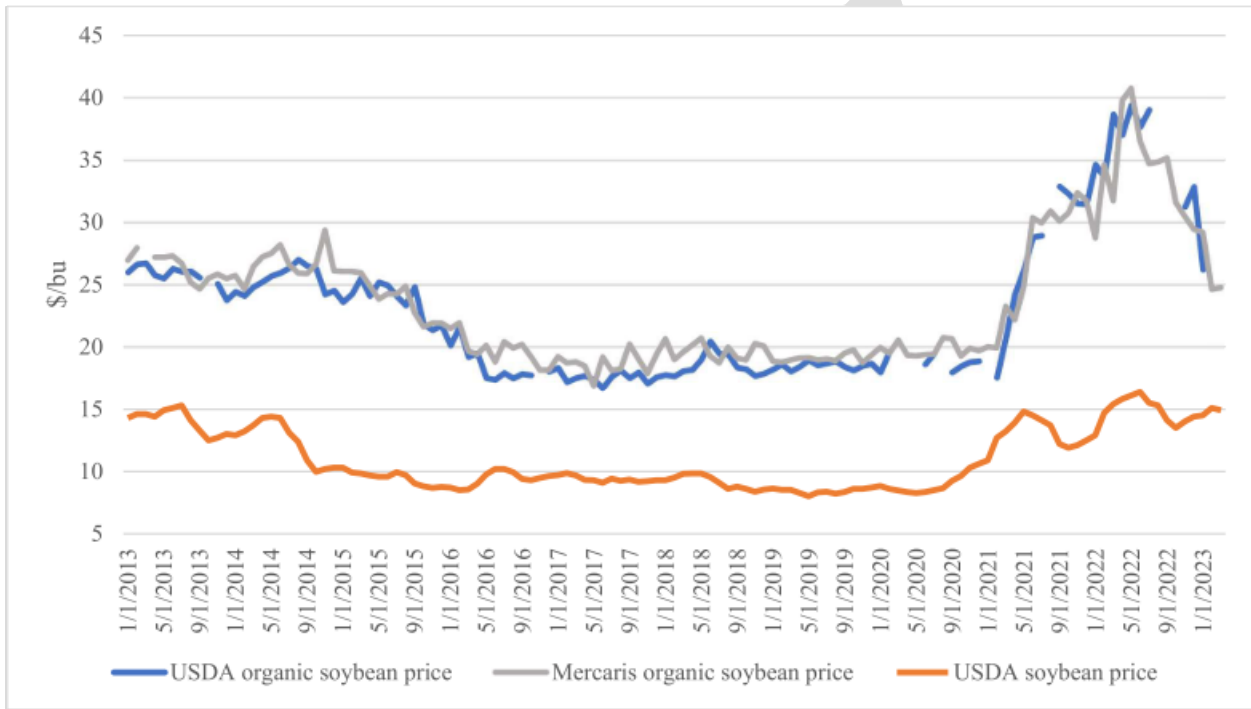


Figure 4. Soybean Prices, 2013-March 2023

Figure 4 displays conventional and organic soybean prices. Similar to corn, it is obvious that there is a general relationship between the soybean price series. However, the spike in organic prices was extreme in 2021-2022.

Table 6 summarizes the organic and conventional soybean prices as well as the resulting premium based on the estimates of organic prices from USDA and Mercaris. On average from 2013 through March 2023, organic soybeans cost about double conventional soybean price. The relative variation in organic and soybean prices was similar as reflected in the coefficients of

² Mercaris soybean price is for “organic Soybeans --Food Grade USDA National Organic Program (NOP) or NOP-equivalent certified, grades generally accepted as USDA U.S. No. 1 Soybeans (greater than or equal to 0.2% Heat, less than or equal to 2% Damage, less than or equal to 2% FM, less than or equal to 10% Splits, less than or equal to 1% of other color, less than or equal to 10% other material) Single variety, general food use, such as soy milk, soy sauce and tofu. --Feed Grade USDA National Organic Program (NOP) or NOP-equivalent certified, grades generally accepted as USDA U.S. No. 2 Soybeans (less than or equal to 0.5% Heat, less than or equal to 3% Damage, less than or equal to 2% FM, less than or equal to 20% Splits, less than or equal to 2% of other color, less than or equal to 10% other material) Single variety, general food use, such as soy milk, soy sauce and tofu.” (Mercaris, 2023).

variation which were 22 to 25 percent. The resulting organic premium was relatively more volatile with CV values of 34 and 39 percent.

Table 6. Soybean and soybean meal price summary statistics, 2013-March 2023

	USDA organic soybean price	Mercaris organic soybean price	USDA conventional soybean price	USDA organic premium	Mercaris organic premium
			\$/bu		
Average	22.77	23.57	11.02	11.64	12.36
Standard Deviation	5.64	5.19	2.49	4.58	4.23
Coefficient of Variation	0.25	0.22	0.23	0.39	0.34

Correlations between the soybean prices are displayed in Table 7. Similar to corn prices, both sources of organic price are highly correlated (although it should be noted that the USDA organic soybean price periodically has missing values while the Mercaris price does not). The conventional soybean price is about 80 percent correlated with variations in organic soybean prices. The table also contains the USDA conventional soybean meal price which is discussed in the next section.

Table 7. Soybean Price Correlations, 2013-March 2023

	USDA organic soybean price	Mercaris organic soybean price	USDA conventional soybean price
Mercaris organic soybean price	0.96		
USDA conventional soybean price	0.79	0.82	
USDA conventional soybean meal price	0.62	0.67	0.86

Soybean Meal

Soybean meal is created when soybeans are roasted and crushed with the co-product being soybean oil. The margin between soybean and soybean meal price is referred to as the “crush.” Using the conventional soybean to soybean meal price ratio, the organic soybean meal price (using Mercaris soybean meal price) was calculated. The conventional and implied organic soybean meal prices are displayed in Figure 5.

Discussions with industry personnel suggest that the price difference between organic soybean meal and organic soybeans is relatively large the price difference between conventional soybean meal and conventional soybeans because demand for organic soybean meal is very inelastic. The suggestion is that the price differences are double or more for organic soybeans. If this is correct,

then assuming the same price ratio to calculate the implied organic price understates the organic soybean meal price. Mercaris has quarterly organic soybean meal prices available for most quarters since the end of 2016. Figure 5 also includes a series that is a combination of the Mercaris prices when available and the implied organic soybean meal prices in the other months. The result is that organic soybean meal prices in 2022 were triple that of conventional prices.

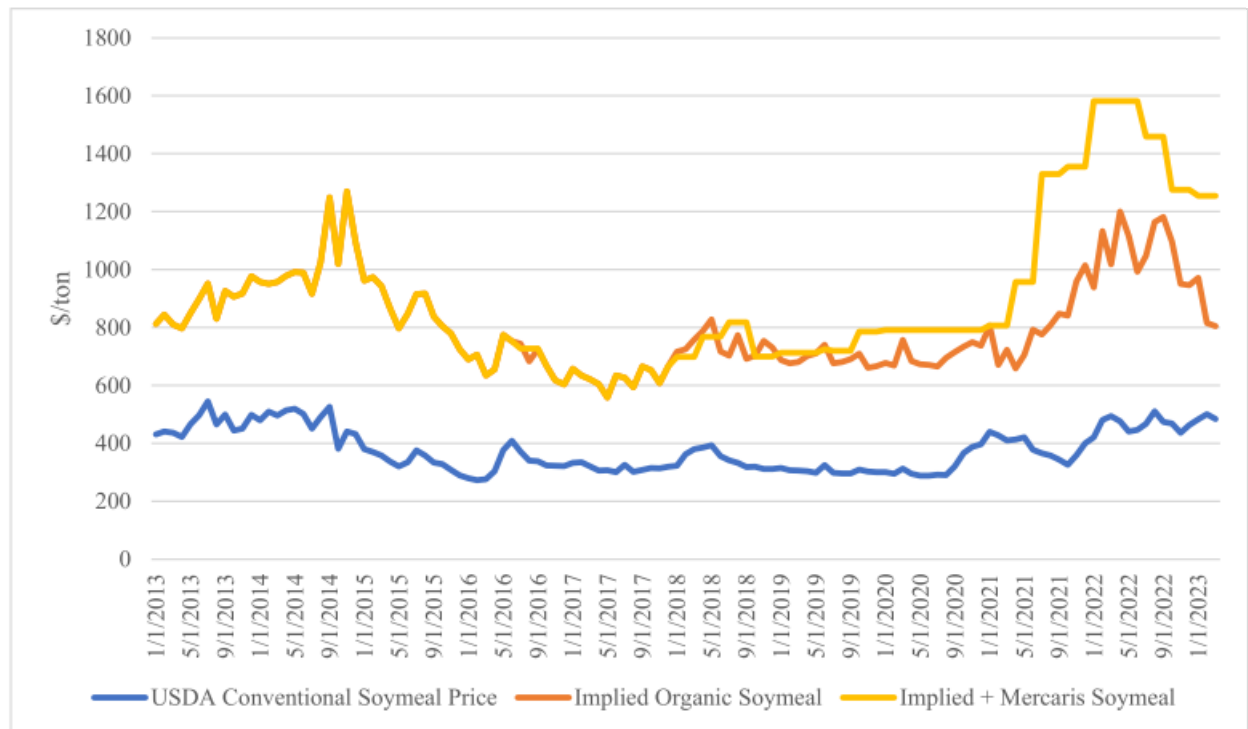


Figure 5. Soybean Meal Prices, 2013-2023

Hay Prices

Forages are particularly important to organic dairy farms given the organic standard specifies cows must graze pasture during the grazing season for their geographic region, which must be at least 120 days per year. Over the grazing season cows must obtain an average of 30 percent or more dry matter intake from grazing (USDA).

There are no available organic hay prices published with any regularity at the current time. Discussions with industry personnel suggest that there is an organic hay premium that depends on location and related factors such as weather and resulting forage availability. The suggestion for the Northeast region is approximately \$100/ton premium but that has shrunk in recent years as the conventional prices increased—a similar pattern to what occurred in corn prices. If we assume a fixed premium, there is nothing to be gained by examining the patterns of conventional and organic prices.

The 2018 Farm Bill required USDA-NASS to begin providing price information for high-quality alfalfa hay for the top five milk production states. This new price series is reported in the *Agricultural Prices* publication. The hay price used in the margin calculation for the DMC program has moved to being the supreme hay price since 2019. The All Hay, Alfalfa Hay and Supreme Hay prices are displayed in Figure 6. In addition to seasonality, the past couple of years increased prices reflect the weather and global energy/commodity spikes.

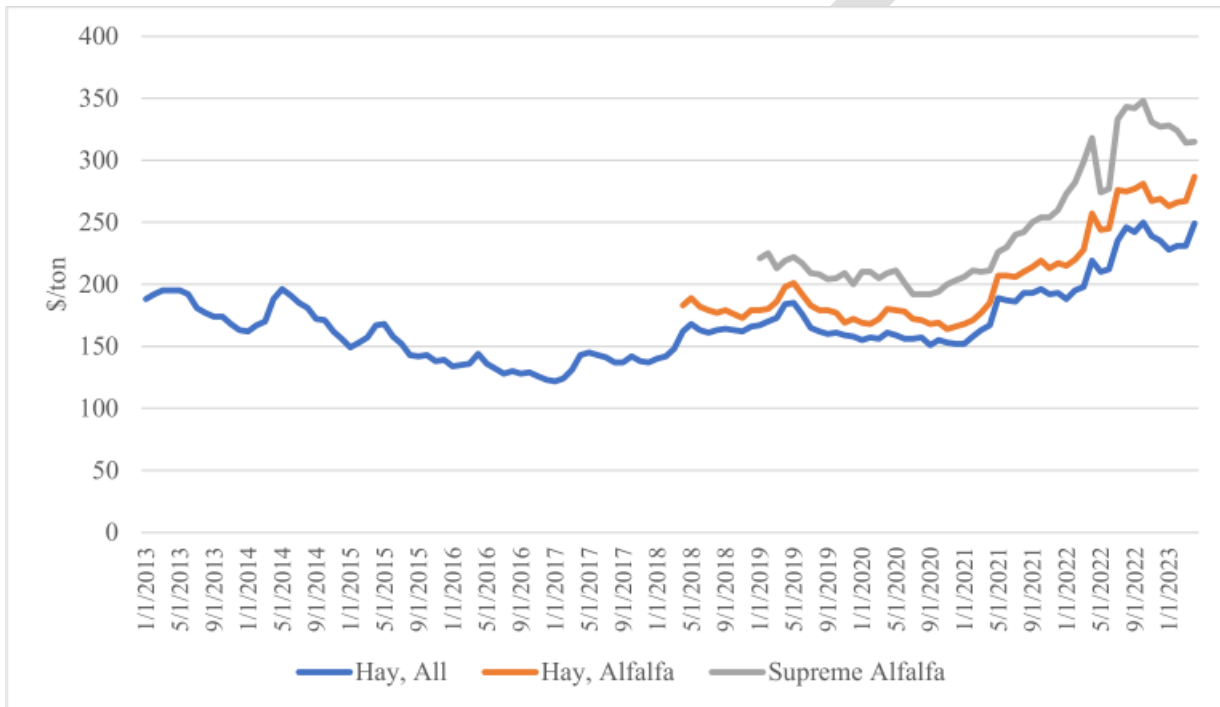


Figure 6. Conventional Hay Prices, 2013-2023

Data Source: USDA-NASS *Agricultural Prices*.

Figure 7 displays the cost per hundredweight of milk produced for the existing DMC program with conventional prices and two organic feed prices, both of which use the existing program weights for corn, soybean meal and hay prices. The first organic feed price uses the organic corn prices, implied organic soybean meal prices and implied organic hay prices as discussed above. The second organic feed price index replaces the implied soybean meal prices since 2016 with the Mercaris organic market soybean meal prices when available. The correlation coefficient between the conventional and implied organic feed cost per hundredweight over the entire period considered was 0.61.

Feed Cost

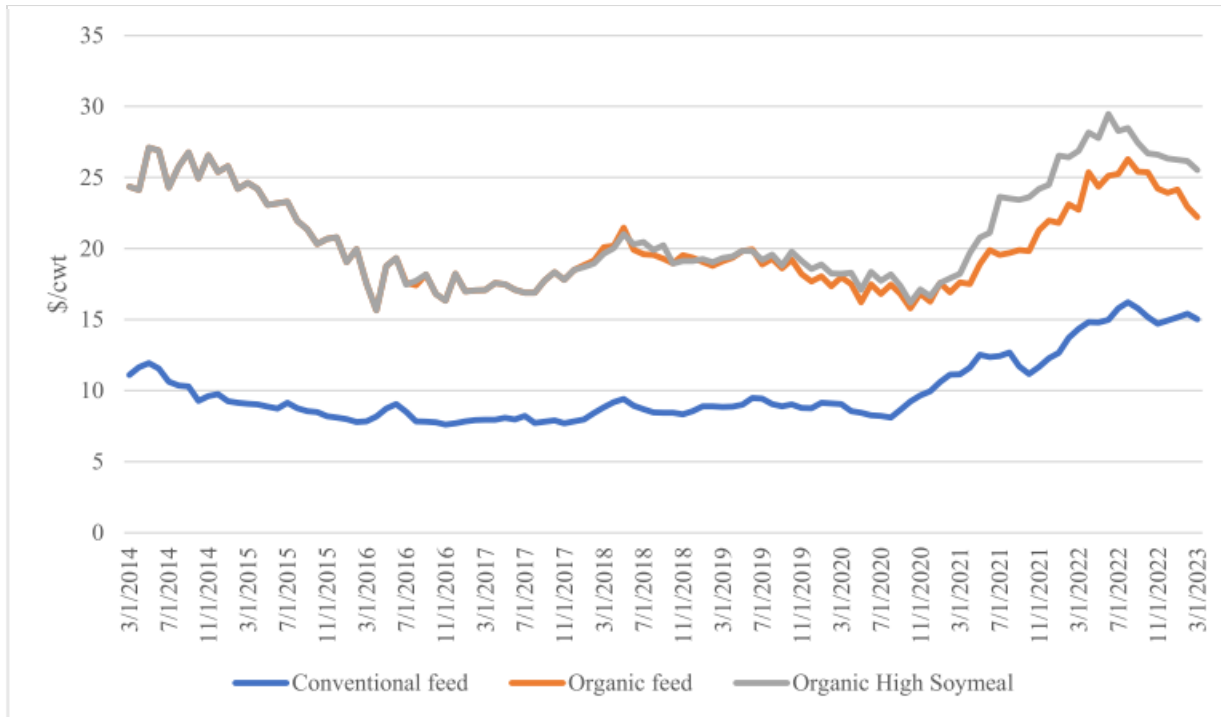


Figure 7. DMC conventional and implied organic DMC feed cost

Over a 9 year period from March 2014 through March 2023, the conventional DMC feed cost averaged about \$10/cwt (Table 8). For the same period, using the same feed weights, the organic feed cost was about twice as much at \$20 to \$21/cwt.

Table 8. Feed Cost Index Summary Statistics, March 2014-March 2023

	Conventional Feed Price	Organic Feed Price	Organic Feed with High Soymeal
		\$/cwt	
Average	9.96	20.32	21.10
Standard Deviation	2.36	3.11	3.65
Coefficient of Variation	0.24	0.15	0.17

Factors contributing to Organic Feed Price Volatility

As a risk management program, a key aspect of the DMC is that it assists when milk prices are low or feed prices are high. The volatility in feed prices is of paramount importance. The US is a large net exporter of conventional corn and soybeans so that, while international factors are certainly important, local supplies are available in most locations and periods. Also, since cattle are ruminants, they can utilize a wide variety of by-products particularly as protein sources (e.g., cottonseed, corn gluten feed). The result is that while conventional dairy farmers tend to grow most or all of their forage requirements and a significant portion of grain needs, finding supplemental grains and forages if needed is generally not difficult—although it may be expensive.

In contrast, organic feed supplies are generally quite limited and thus very sensitive to supply shocks. Organic dairy farmers often strive to grow their own feed including forages and any grains needed. The US is a net importer of organic corn, soybeans and soybean meal. Over the past decade, that gap between domestic production and domestic use had been narrowing at least for corn (Feed & Grain, 2021). In 2021, U.S. imports of organic corn, soybeans and soybean meal for livestock feed totaled \$594 million. For comparison, the value of U.S.-produced organic feed that year totaled \$397 million (Mercaris, 2023).

Organic soybean meal has been extremely expensive in the past couple of years largely owing to lost sources for imports. US organic soybean processors filed an anti-dumping complaint with the US Department of Commerce and the US Trade Commission against India March 31, 2021 (Byrne, 2021). Indian soybean meal accounted for 42% of US supply in 2021 which was estimated to be double the domestic supply (Byrne, 2021). The judgement against India came down in May 2022 along with large antidumping duties (US Federal Register, 2022).

Virtually simultaneously, the USDA Agricultural Marketing Service (AMS) National Organic Program (NOP) ended its recognition agreement with India (USDA-AMS, 2023). The recognition India to accredit certifiers to provide USDA organic certification for their soybean meal exports. Upon ending the recognition agreement, AMS provided an 18-month transition period for Indian organic operations to become certified directly by a USDA-accredited certifier. That transition period ended on July 12, 2022. This change also increased the cost of organic soybean meal from India.

These developments both directly limited the supply and increased the price of organic soybean meal supply from imports. Peak imports of Indian organic soybean meal into the US were in 2020 and since have declined precipitously (Mercaris, 2023). In May 2023, organic soybean meal imports from India had declined by 90% over a year earlier (Mercaris, 2023).

As long as the US is heavily reliant on imports in a relatively thin world market, the marginal cost of organic feedstuffs for milk production is likely to remain high and volatile.

Milk Price

DMC uses the All Milk price reported monthly by USDA. While this price is not any farm's mailbox price except by coincidence, it is correlated with milk prices everywhere. Organic farm milk prices are more difficult to ascertain. For this research, annual organic farm milk price received as reported by the Center for Farm Financial Management at the University of Minnesota from 2005 through 2022 are utilized. While the UMN farms may not be nationally representative, they are consistent in terms of methods. Mercaris reports monthly delivered organic farm milk prices from March 2021 to January 2023. For comparison, annual averages are utilized for 2021 and 2022. The discussion focuses on the margin between the organic and conventional farm milk prices.

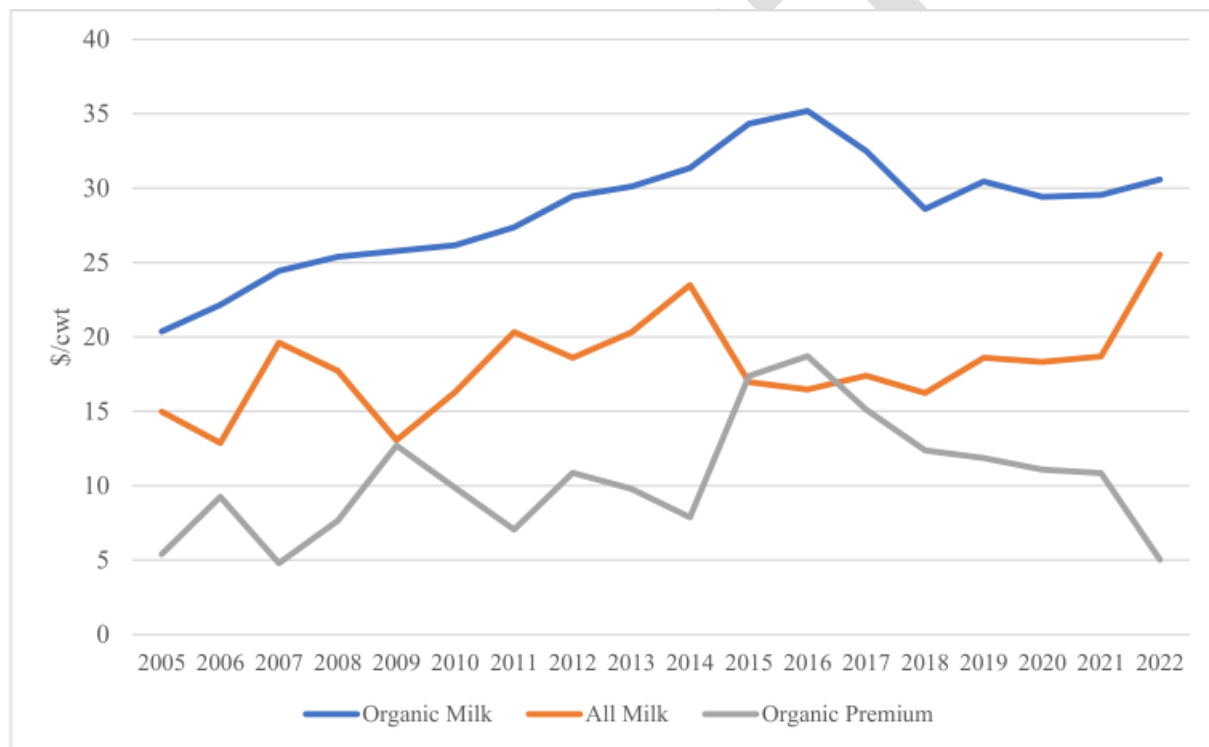


Figure 8. Organic Farm Milk and Conventional All Milk Price, Annual 2005-2022

Farm Milk Price

Figure 8 displays the average conventional and organic farm milk price from 2005 through 2022. The trend in both series was upward sloping. However, during the inflation of 2022, the two prices converged. The result is that the organic premium over conventional both began and finished the period at about \$5/cwt.

Table 9. Organic Farm Milk and Conventional All Milk Price, 2005-2022

	UMN Organic Milk Price	USDA Conventional All Milk Price	Organic Price Premium
		\$/cwt	
Average	28.51	18.09	10.43
Standard Deviation	3.93	3.17	3.94
Coefficient of Variation	0.14	0.18	0.38

Table 9 displays the summary statistics for the annual organic and conventional milk prices. On average, organic prices were more than \$10/cwt above conventional milk prices (an average premium of 57.7%). In terms of variation, conventional milk prices from this series were more volatile than organic farm milk price.

Retail Milk Prices

Because publicly available farm-level organic milk prices are difficult to find, we also examine the retail prices of organic and conventional beverage milk. In this case, whole milk prices are utilized. Retail milk prices from the USDA Retail Milk Prices Report which are a national average from cities where the price is from three stores each month in each city. USDA data on retail milk prices are available since January 2018. The organic retail price is only reported as a half-gallon, which is the most common container size for organic milk. Therefore that value is doubled for an “implied” organic premium. In actual fact, the organic gallon price is likely less than twice the half gallon price. Over that period the premium for organic whole milk beyond the conventional whole milk price was very stable perhaps reflecting long-term agreements and retailer desire to keep the price constant if possible (Figure 9).

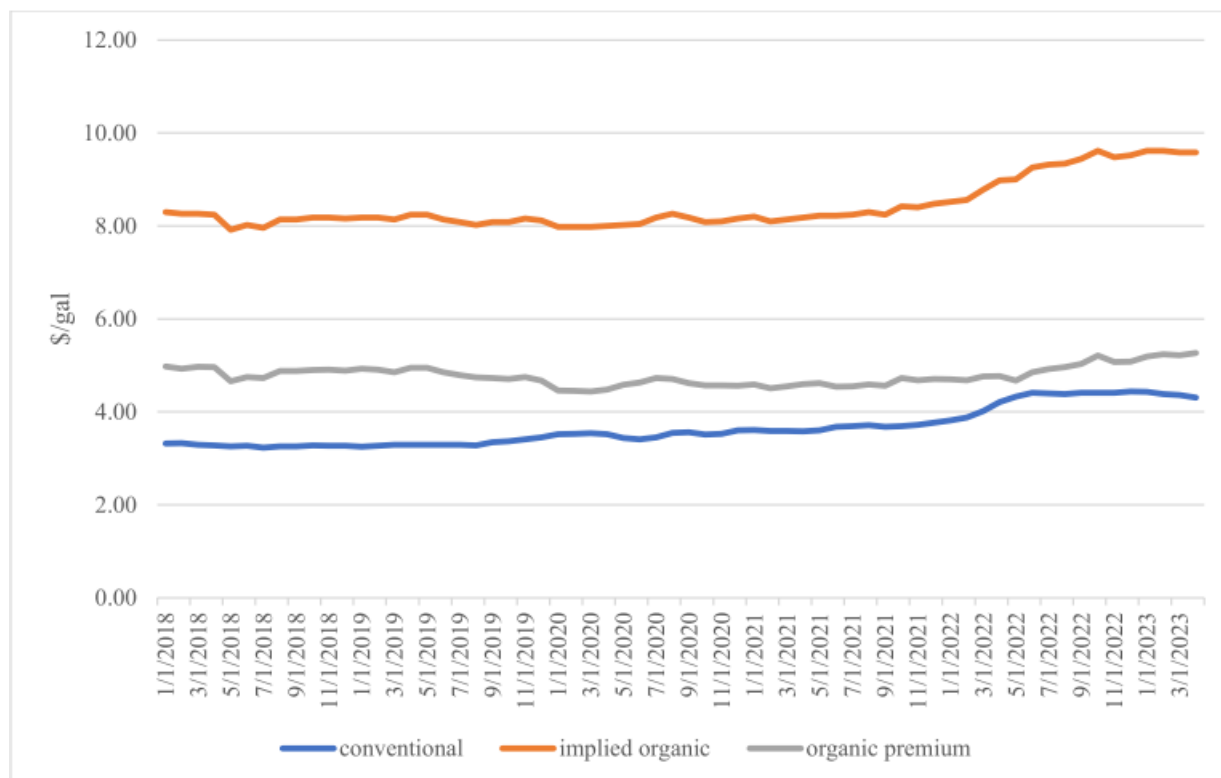


Figure 9. Retail Whole Milk Price, 2018–April 2023 Source: USDA Retail Milk Prices Report

Over the approximately five-year period from January 2018 through April 2023, the average implied price of organic milk reported was \$8.43/gallon (\$98.04/cwt) while conventional whole milk averaged \$3.65/gallon (\$42.45/cwt) (Table 9). The organic premium averaged \$4.78/gallon (\$55.59/cwt). The relative amount of variability (CV) was identical for both types at the retail level.

Table 9. National Monthly Retail Whole Milk Prices, January 2018–April 2023

	Organic Milk	Conventional Milk	Organic Premium
Average	4.22	8.43	4.78
Standard Deviation	0.26	0.53	0.21
Coefficient of Variation	0.06	0.06	0.04

Source: USDA Retail Milk Prices Report

Income Over Feed Cost Margin

Whether there is more risk in the income over feed cost margin for organic dairy farms than conventional is a primary motivation for this research. This depends very much on the price series utilized as well as the weights put on the diet components. Using the same feed quantities per hundredweight of milk as the conventional DMC, organic corn prices from Mercaris, implied organic soybean meal prices as calculated above, and conventional hay prices (i.e., assuming that organic hay prices are not significantly different), we can examine and compare income over feed cost margins.

Figure 10 displays the milk income over feed cost margins for the conventional DMC and two versions of a hypothetical organic DMC program. The figure demonstrates how much worse 2022 was for organic dairy farms than conventional farms.

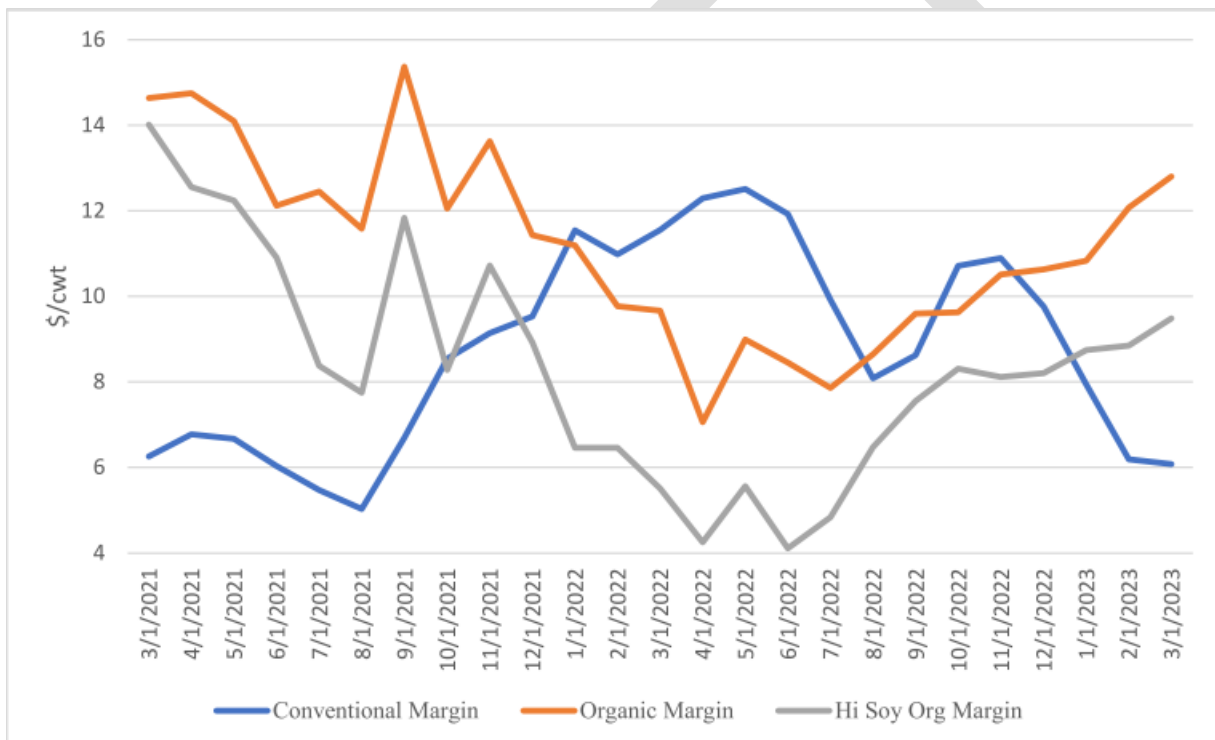


Figure 10. Conventional and Organic Income Over Feed Cost Margin, March 2021-March 2023

Issues and Options

If an Organic DMC were pursued, there are a number of issues and questions that must be addressed including data sources and feed component weights.

USDA collects organic corn and soybean prices. Soybean meal and alfalfa prices are not reported. It might be reasonable to use the organic soybean price but this would require more

research into the organic crush margin. Similarly, organic hay prices are likely to be correlated with conventional hay prices but more analysis is needed to establish a reasonable premium. Alternatively, market prices for organic soybean meal and hay could be collected.

The organic farm milk price is another issue. Previously, some of the organic dairy organizations reported a pay price but have not done so in recent years. Mercaris has begun to collect these prices for the organic spot market. Many organic farms receive annual milk price agreements which can provide stability in some periods but might also mean that those farms miss out on short-run milk price increases. USDA could likely collect organic farm milk pay prices from the major players with some sort of MOU as far as use and reporting.

One aspect that is unique with respect to the dairy industry is that, in addition to being much smaller on average than conventional dairy farms, organic dairy farms are much more likely to be Anabaptist (in particular Amish or Mennonite). Anabaptist farms often do not participate in government programs or utilize formal price risk management instruments. Anabaptist farmers may make up a majority of organic dairy farms in some counties or regions. These farms largely do not participate in the existing DMC program. If they do not choose to participate, that would blunt the effectiveness of an organic DMC program. On the other hand, it would also limit the cost of the program.

Policy Options

The policy options include but are not limited to the following. First, status quo—organic dairy farms can use conventional DMC. While it is clear that the DMC program, particularly in 2022 did not reflect the feed cost risk and resulting profit on organic dairy farms, it is possible that was anomalous. Organic dairy farms did receive *ad hoc* payments in 2022 but this remains an unreliable and inconsistent option.

A second option is to create an organic specific organic program. This option, as well as the one in the next paragraph, would require USDA collection and reporting of farm-level organic milk and feed prices. Perhaps working with an MOU with organic cooperatives and processors and also, considering the methods and work of Mercaris, the USDA could arrive at reliable and useful organic milk and feed prices. This option could be an entirely independent organic margin coverage program or it could be the conventional with an adjuster for when the organic margin diverges from a “normal” relationship with the conventional margin whether because of abnormal milk or feed markets.

Because it is clear that most of the profit margin risk for organic dairy farms has been driven by feed prices, a third option is to create an organic-specific add-on feed-cost adjuster. A feed adjuster might be useful for risk management on certified organic farms in situations where the feed cost increases more than the conventional feed price as occurred in 2022. Consider the example from the Milk Income Loss Program (MILC) which was created in the 2008 Farm Bill. Initially, MILC payments were triggered using only the Boston Class I price of \$16.94/cwt. After recognizing the feed price risk that really ramped up in 2007, the program added a feed cost

adjuster that increased the indemnity payment when the average feed cost calculated by USDA exceeded a trigger level. Consider, for example, an option for certified organic dairy farms to receive an additional or supplemental payment when either the organic feed cost or the difference between the organic and conventional feed costs exceeds a trigger level. For example, when the feed cost per hundredweight is more than \$10 different between organic and conventional milk production, then that difference is added to payments for participating certified organic dairy farm milk.

Finally, it is worth considering whether existing or new crop insurance programs might be useful for organic dairy farm risk management. Because organic farms feed more forage—particularly in the form of pasture—than the typical conventional dairy farm, one program that might be useful is the relatively new Pasture, Rangeland, Forage crop insurance contract. While this tool might be useful for forage yield and cost risk, it will not address the feed cost risk induced by organic corn and soybean prices. Whole farm revenue tools might also be tailored to organic dairy farms but it is likely that the subsidy required to make the insurance contract attractive would be quite large. These insurance contracts also face the challenge of some organic farmers being opposed to risk management tools.

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