

# **Determining the Current Cost of Producing Milk in Maine in 2022: Results from the 2023 Cost of Production Study**

**RFP# 202303046**

**Maine Department of Agriculture, Conservation, and Forestry  
and the Maine Milk Commission**

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## **Executive Summary**

The current study on the Cost of Producing Milk in Maine in 2022 was a two phase project. The phases of the project are detailed below:

### **Phase 1 of study**

The first phase of the project was a survey of all licensed dairy producers shipping/selling milk in calendar year 2022. In past studies, the snapshot survey was limited to conventional dairy producers, but the current study surveyed all 155 dairy producers representing conventional and organic dairy producers. All producers were requested to respond to the one page survey up to three times. After three requests, the response rate was 74.8% (116 returns/155 farms). Details of the survey results can be found in Table 2 of this report.

In evaluating the snapshot of Maine dairy farms in 2022 with the survey done in 2019, computerized accounting software was the most frequent response with use of a checkbook ledger as the next most common form of recordkeeping. Pasture is still used by a high majority of farms in the current study at 69.5% of farms reporting some form of pasture use with their cattle. Pasture use is higher in the current study in part due to the inclusion of organic farms in the snapshot survey since they are required to utilize pasture for a portion of their dry matter intake. The number of producers raising corn for silage (73/112 respondents) was similar to the 2019 study (78/103 respondents) as was the total average acres (231 acres for 2022 compared with 226 acres for 2019) of corn for silage even though the current survey included organic producers. Use of cover crops for those farms producing corn silage did not rise appreciably between the 2019 (50%) and 2022 (55.7%) studies with approximately half of the responding farms growing corn silage using cover crops. In the current snapshot survey, the percentage of farms milking in a parlor was still the main type of milking facility followed by a pipeline system, flat barn parlor, bucket milker and two respondents using hand milking. The number of farms participating in a production recordkeeping system like the Dairy Herd Improvement Association (DHIA) was similar between the two studies with the percentage of farms participating in 2019 was 58.3% and 2022 60.5%.

### **Phase 2 of study**

The second phase of the study was to calculate the /Short Run Breakeven (SRBE) cost of production for 32 representative conventional farms across the four tiers of milk production. Numbers of farms studied were in the same ratio of farms in each tier for the industry. Organic farms were not included in this phase of the study. This study sample represented roughly one third of conventional dairy farms. Milk production expenses were collected from individual farms using accounting and income tax data. Adjustments to expenses were made to make sure expenses represented milk production expenses in calendar year 2022. Details of data collection and adjustments made are in this report. A total of 31 conventional farms completed phase 2 of the project. The overall average cost of milk production was

calculated for all the dairy farms studied as well as the average cost of milk production for representative farms in each of the four milk production tiers. The short run break even price for the four tiers and overall are:

<b>Maine Conventional Milk Industry Cost of Production Study, 2022</b>					
	<b>Tier 1</b>	<b>Tier 2</b>	<b>Tier 3</b>	<b>Tier 4</b>	<b>Overall</b>
No. of Farms Completing Study	13	9	4	5	31
Average Cash Operating costs – Short Run Break Even (SRBE)	\$28.90	\$29.17	\$27.61	\$26.87	\$28.49

The current study surveyed approximately one third of all the licensed conventional farms in Maine. No other study of the cost of milk production in the United States compares with this level of participation.

### **Introduction**

The research goal was to determine the cost of producing fluid milk for conventional dairy farms in Maine that fall into four levels of milk production, or tiers, established by L.D. 1758 in the 124<sup>th</sup> legislature and defined in Maine Revised Statutes, Title 7, Section 3153-b. For the 2022 study, detailed expense data was collected on economic and production performance data via mail, email, phone and onsite interviews to accurately measure each selected dairy farm’s costs of milk production. Farm financial data including farm accounting records and tax forms were carefully evaluated. The main goal of this study was to evaluate the expense side of the milk production business and did not include data collection on the income side.

The Maine Milk Commission is specifically interested in the cost of producing milk in Maine in 2022. In this report, this cost is labelled as the short run breakeven cost of milk production. As has been done in past studies, the cost survey allowed the collection of data on depreciation and estimates of unpaid family labor on Maine dairy farms to augment the financial dynamics present in the Maine dairy industry and the short run break even cost of milk production to provide a broader description of the costs of milk production.

### **Study Procedure**

This study consisted of two parts. The first part of the study was a survey of all the licensed Maine dairy farms (both conventional and organic- 155 total farms) to determine a broad overview of the demographic make-up of the Maine dairy industry. The second phase of the study was a detailed evaluation of milk production costs on Maine conventional dairy farms. The goal of this phase was to collect more detailed and specific data from thirty-two (32) Maine dairy farms.

Initial surveys were mailed to all conventional Maine dairy farms that shipped milk to a wholesale market in 2022 or sold milk from the farm. Of these 155 farms, producers responded with initial production, herd size, labor, acres in feed crops, use of pasture and cover crops, recordkeeping, numbers of workers, and type of milking system as well as other descriptors. Farms were contacted up to three times to complete the survey. The results section details the specific mailings and response to each. Response rate was 74.8% (116 returns/155 farms). A copy of the brief survey to get a snapshot of the industry is included in appendix 1.

In the second phase of the study, conventional farms were divided into four groups based on yearly production volumes (tiers). Dairy farms in Maine are categorized into four tiers based upon their annual

production levels and receive Maine Dairy Stabilization “Tier” Program payments based on what tier they are in when milk price falls below the target price for that tier. A farm is identified by the tier in which it ends the year relative to their production. Farms move through each of the four tiers as their total production increases. All farms begin the year in Tier 1 and move into Tier 2 after they produce 16,790 hundredweight (cwt). Likewise, farms move to Tier 3 after producing 49,079 cwt. and into Tier 4 after producing more than 76,800 cwt. Many farms never move out of Tier 1. If a farm is referred to as a Tier 2 farm, it indicates a farm that ended the milk production year in Tier 2.

Maine had a total of 103 conventional dairy farms in 2022; the 52 organic farms were not included in the second phase of the project. Numbers of farms from each tier were selected to represent the proportion of producers in Maine in each tier. The percentages reflected in each tier for Tiers 1 through 4 respectively, were 45.1%, 31.1%, 8.8% and 14.7% of Maine’s 103 conventional dairy farms. Multiplying these percentages yielded the following desired breakdown of farms for the study: 14 Tier one farms, 10 Tier two farms, 3 Tier three farms and 5 Tier four farms. Farms selected to participate in the data collection process within each tier group were representative of each tier group from the standpoint of farm size, geographic location, and breed. (Table 1). The thirty-one farms that completed the milk production expense data collection process in phase two of this study made up 30.1% of the conventional Maine farms shipping milk and produced 30.4% of the conventional milk in 2022. As a percentage of total farms summarized, this compares with 22.4% of conventional farms in the 2016 study and 27.2% of farms in the 2019 study..

**Table 1. Characteristics of Study Farms, 2022**

	<b>Tier 1</b>	<b>Tier 2</b>	<b>Tier 3</b>	<b>Tier 4</b>
<b>No. Conv Farms (total =103 total)</b>	47	32	9	15
<b>No. Farms in Study (total=32) - Goal</b>	14	10	3	5
<b>No. Farms completing study (total=31)</b>	13	9	4	5
<b>Avg Yearly Production per study farm, cwts</b>	10,087.5	34,820.2	63,277.2	154,658.3
<b>Avg No. Cows per farm*</b>	52.4	160.2	246.5	583.2

\*Herd size estimated by owners during interviews

All relevant cost components were collected to determine the cost of milk production. Financial forms from each farm were reviewed to determine milk production expenses in 2022 including milk checks, summary reports from farm financial recordkeeping systems, and tax forms, Schedule F and Form 4562. Depreciation costs were recorded. To do some accounting adjustments, farmers were asked to report the expenses pre-paid in 2021 for 2022 and in 2022 for 2023 as well as the amounts in open accounts carried forward from 2021 to 2022 and from 2022 to 2023. Lastly, farmers were asked to estimate the number of hours of paid family labor, to estimate the hours of unpaid family labor, and estimate hours of paid nonfamily hours they had in 2022.

Cash operating costs were adjusted as previously mentioned for prepaid expenses in both years 2021 and 2023. Bills carried over into 2023 from 2022 were added to 2022 expenses, while bills carried into 2022 from 2021 were subtracted. Components of the milk production expenses included, but weren’t limited to hired labor, dairy feed, machinery rent/lease, machinery repairs, fuel, breeding, veterinary and medicine, milk marketing and promotion, dues, bedding, licenses/registration, utilities, milk room supplies, production testing, fertilizer/lime/seeds/sprays, repairs, property taxes, interest, insurance, and miscellaneous livestock expenses. Farm record systems were evaluated for non-milk production expenses and removed from the calculations when found. Please note that principal on loan payments is not included in the cost of milk production, but the interest is treated as an expense and is included in cost calculations.

For those operations that produced feed for sale, crop production expenses were adjusted to those costs that supported milk production of the farm. For example, there were some farms that produced more acres of corn silage/corn grain than they used on their farm; forage/corn grain from these extra acres was used as an additional source of income and sold to other farms. Producers were asked to estimate the crop production expenses to cover the crops that were used for milk production on the farm.

Producers were asked if every worker on the farm received a regular paycheck that was included in the hired labor expenses, especially in those farms operating as corporations and partnerships. Producers were also asked if the owner received a regular paycheck that was included in labor expenses. In past studies, this information was used to adjust corporations/partnerships/LLC to single proprietorships by removing one principal owner from the hired labor. The value used was obtained from the Farm Credit Dairy Farm study. In their current report for 2022 farm data, Farm Credit no longer has these calculations. In the current study, this procedure really did not achieve the desired effect since removing the average labor value resulted in a very low hired labor value that when spread over the other employees was not correct. The hired labor in the current study was not adjusted. Similarly, in past studies, a management fee was added to reflect pay to the owner/operator. Since a correction for sole proprietor/corporation was not done, an operator/owner management fee was not added. This is not a calculation that was requested by the Maine Milk Commission but was included for additional information.

The value of \$15.00 per hour was used for the calculation of unpaid family labor. In phase 1 of the study, producers were asked what they paid for general farm labor; the average of all responses was \$15/hr. Unpaid family labor is important for the operation of a farm; if family labor was not available for farm tasks, farm labor would need to be hired to carry out these tasks. The calculation of the value of unpaid family labor is important to help get a clearer picture of the true labor cost to run each farm. This number is consistent with what was used earlier and agrees with values for basic farm labor on dairy farms. This is not a calculation that was requested by the Maine Milk Commission, but was included for additional information.

## **Study Results**

### **Part 1 – A Demographic Summary of the Maine Dairy Industry 2022**

The initial phase of this project consisted of a short survey that was mailed to a total of 155 conventional and organic licensed Maine dairy farms that had shipped milk in 2022. Respondents were contacted up to a total of three times to collect some basic dairy industry information (see Appendix 1). For example, all 155 farms were sent coded survey forms with stamped addressed reply envelopes. Those farms not responding within a month of the mailing were sent the survey a second time. Those not responding during the second month were sent a third survey and request. A response rate of 39.4% (61/155) was obtained from the first mailing, 43.6% from the second mailing (41/94) and 28.3% (15/35) from the third mailing. This system yielded 116 total responses from the 155 farms contacted for a 74.8% response rate. The response rate of the current survey was lower than the study done on 2019 milk production that had a response rate of 79.5% (105/132 farms).

Table 2 on the next page illustrates a snapshot of the dairy industry based on the survey responses. Not all numbers add up to the total responses because not all farms answered each question.

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**Table 2. Snapshot of the Maine Dairy industry (Conventional and Organic) in 2022 based on survey responses.**

		No. Farms	Responding
<b>Average No. Milk Cows/farm</b>	169.5 cows	116	
<b>Farm Recordkeeping Used</b>	Farm Acct Book	15	
	Quickbooks or other software	67	
	Checkbook ledger	23	
	Outside Accountant	3	
	Farm Credit/other	2	
	Other	6	
<b>Use Pasture System</b>	Yes	69	Avg Acres/farm = 75.2
<b>Milk Cows</b>		63	
<b>Dry Cows</b>		67	
<b>Heifers</b>		63	
<b>Grow Corn Silage</b>	Yes	73	Avg Acres/farm=231
	No	39	
<b>Utilize Cover Crops In Fall if grow corn silage</b>	Yes	39	
	No	31	
<b>Avg Acres Hay land</b>		104	Avg Acres/farm=274
<b>Milking System</b>	Parlor	66	
	Flat barn parlor	8	
	Pipeline	37	
	Bucket	3	
	Hand milking	2	
<b>Use Production Record Program like DHIA</b>	Yes	69	
	No	45	
<b>Feeding System</b>	TMR	66	
	Grain fed Separate	43	
<b>Management Practices PFAS*</b>	Yes	13	
	No	96	
<b>Calculated Averages Based on Survey Responses</b>			
Calves per milk Cow	0.38	116	
Heifers per milk Cow	0.42	116	
Avg Lbs Milk per Cow per Year	18,224	116	

\*Per- and Polyfluoroalkyl Substances (PFAS)

In evaluating the snapshot of Maine dairy farms in 2022 with the survey done in 2019, computerized accounting software was the most frequent response with use of a checkbook ledger as the next most common form of recordkeeping. Pasture is still used by a high majority of farms in the current study at 69.5% of farms reporting some form of pasture use with their cattle. Pasture use is higher in the current study in part due to the inclusion of organic farms in the snapshot survey since they are required to utilize pasture for a portion of their dry matter intake. The number of producers raising corn for silage (73/112 respondents) was similar to the 2019 study (78/103 respondents) as was the total average acres (231 acres for 2022 compared with 226 acres for 2019) of corn for silage even though the current survey included organic producers. Use of cover crops for those farms producing corn silage did not rise appreciably between the 2019 (50%) and 2022 (55.7%) studies with approximately half of the responding farms growing corn silage using cover crops. In the current snapshot survey, the percentage of farms milking in a parlor was still the main type of milking facility followed by a pipeline system, flat barn parlor, bucket milker and two respondents using hand milking. The number of farms participating in a production recordkeeping system like the Dairy Herd Improvement Association (DHIA) was similar between the two studies with the percentage of farms participating in 2019 was 58.3% and 2022 60.5%.

Producers were asked if they had made any management changes to respond to potential Per- and Polyfluoroalkyl Substances (PFAS) levels on their land. Of 109 producers responding to that question, 13 responded that they had made management changes to evaluate their risk.

A few indices were calculated from survey responses to evaluate the replacements per milking cow and average lbs of milk per cow per year. On the average, responding farms raised less than 1.0 heifer per milking cow (.8 heifers/milking cow). The calculated average milk production per milking cow in 2022 was lower (18,224 lbs) in the current study compared with the 2019 study (20,624 lbs); this was most likely due to the inclusion of organic herds in the survey. In total, the inclusion of organic farms in the current survey reflects a more accurate snapshot of the Maine dairy industry than surveying conventional farms alone. These indices are useful to compare with other studies and will establish a base for comparison in further Maine studies.

## **Part II – Evaluation of Milk Production Expenses on individual farms**

The Maine dairy industry changed in total number of dairy farms from 247 in 2016 to 220 in 2019 and 155 in 2022. The number of conventional dairy farms decreased from 161 farms in 2016 to 132 in 2019 and 103 in 2022. As indicated earlier in the methods section, thirty-two (32) Maine dairy farms representing the four Tier levels were chosen to be interviewed to gather data for the current study.

Tables 3a, 3b, and 3c below compare the number of study farms that were initially desired, the average number of milk cows per herd, and the average production per cow for the current and previous two Cost of Production studies. The overall average number of milking cows per herd in phase two of the 2022 study was 194.35 cows. This compares with the statewide survey average from 116 farm survey responses in phase one of 169.5 (organic and conventional) compared with the 2019 average of 184.8 (conventional) cows. Evaluating the data in Table 3b below, there is a decrease in the Tier 4 milking cows per farm compared with the average in the previous Cost of Production studies, but consistent with the studies done in 2016 and 2013. Similarly, the average production of Tier 4 farms (Table 3c) is lower in the current study compared with the 2019 study, but consistent with the studies done in 2016 and 2013.

**Table 3a. Numbers of Maine farms completing the current and previous three Cost of Production studies.**

	<b>Tier 1</b>	<b>Tier 2</b>	<b>Tier 3</b>	<b>Tier 4</b>
No. Farms in Study 2013 (total=37)	16	10	3	8
No. Farms in Study 2016 (total=36)	17	10	4	5
No. Farms in Study 2019 (total=36)	16	12	3	5
No. Farms in Study 2022 (total=31)	13	9	4	5

**Table 3b. Average Number of Milking Cows on Maine farms completing the current and previous three Cost of Production studies.**

	<b>Tier 1</b>	<b>Tier 2</b>	<b>Tier 3</b>	<b>Tier 4</b>
Avg No. Cows per Farm in Study 2013	50	157	260	686
Avg No. Cows per Farm in Study 2016	53.5	108.4	215.5	555.8
Avg No. Cows per Farm in Study 2019	51	133	243	899
Avg No. Cows per Farm in Study 2022	52.4	160.2	246.5	583.2

**Table 3c. Average yearly production in hundredweights (cwts) of Maine farms (rounded) completing the current and previous three Cost of Production studies.**

	<b>Tier 1</b>	<b>Tier 2</b>	<b>Tier 3</b>	<b>Tier 4</b>
Avg Yearly Production/farm in cwts 2013	9,783	33,928	60,398	172,422
Avg Yearly Production/farm in cwts 2016	9,843	24,494	58,689	138,538
Avg Yearly Production/farm in cwts 2019	9,878	30,338	64,647	269,969
Avg Yearly Production/farm in cwts 2022	10,087	32,820	63,277	154,658

Table 4 below reports the calculated average costs of milk production per hundredweight for the 2022 study. The first line of the summary containing milk prices is representative of the definition of the short run breakeven (SRBE) cost, which is a standard number for comparison and specifically referenced in statutory language regarding the Maine Dairy Stabilization “Tier” Program (referenced earlier on p 2). Average cash operating expense is the same calculation as SRBE; this term is often used by other authors as a representative term for the cash cost of production. The second line of the table details the addition of depreciation costs to the SRBE. Typically, total depreciation which includes Section 179 depreciation is not added as a cost of production. Typically, assets are capitalized over their useful lifespan and depreciation taken based on that lifespan. Section 179 depreciation allows producers to expense certain assets in the year they were placed in service and the limits allowed under Section 179 have increased in recent years. Section 179 is used more often than in the past because of the tax benefits. Because of the changes in Section 179 depreciation and changes in how it is used, there is not an easy way to include depreciation in a retrospective study. With that in mind and recognizing this issue, total depreciation including Section 179 depreciation was included as a cost in this study as was done in the 2016 and 2019 Cost of Production studies.

The third line represents the calculated cost of production when the SRBE+depreciation+ unpaid family labor costs are considered. Unpaid family labor costs were discussed earlier. Producers were asked to estimate the unpaid work hours retrospectively for family members in each season of the year. Those estimates were modelled to a year long basis and charged a labor cost of \$15 (which was the average labor cost paid by producers in the phase 1 survey). Specifically, hours of unpaid labor were converted to 230 hour months of work and charged the \$3450 (230 hours x \$15/hour=\$3450) per month and then added as an expense per cwt milk.

**Table 4. Maine Conventional Milk Industry Cost of Production Study, 2022. Average Costs of Milk Production per Hundredweight (cwt). 2022**

<b>Maine Conventional Milk Industry Cost of Production Study, 2022</b>					
	<b>Tier 1</b>	<b>Tier 2</b>	<b>Tier 3</b>	<b>Tier 4</b>	<b>Overall</b>
No. of Farms Completing Study	13	9	4	5	31
Average Cash Operating costs – also termed Short Run Break Even (SRBE)	\$28.90	\$29.17	\$27.61	\$26.87	\$28.49
Average Cash Operating costs (SRBE) + depreciation*	\$31.43	\$30.55	\$29.93	\$28.76	\$30.55
Average Cash Operating costs (SRBE) + depreciation + unpaid family labor**	\$34.97	\$31.41	\$30.64	\$28.76	\$32.29
*A measure of total depreciation including section 179 **Unpaid family labor is valued at \$15 per hour. One tier one farm had unpaid family labor over 3X the average and was excluded from the average as an outlier. Management fee for the owner not included in the current study					

In comparing the SRBE numbers of the four tiers, you will note that the cost is higher for tier 2 (avg of 160.2 milking cows; Table 3b) compared with tier 1 (avg of 52.4 milking cows, Table 3b). This is not unexpected due to the change in cow numbers and the cost of machinery to support the larger tier 2 farm. Typically, the smaller farms feed a hay and grain ration, while the larger farms feed a silage based ration needing more mechanization. Looking at purchased feedcost per cwt milk, tier 1 farms averaged \$8.68/cwt., while the larger tier 2 farms averaged \$10.71/cwt. The second major cost is normally paid labor. Four of 13 tier 1 farms did not have any paid labor which contributed to the lower SRBE.

As a means of comparison of the current results with the last study, the calculated costs of production from the 2019 study are included in Table 5. Calculations for the two studies were done the same way except the declared differences in management fee used and value of unpaid family labor. The overall short run breakeven estimate in the current study was \$28.49 per hundredweight which was \$6.55 higher than the 2019 study of \$21.94.

**Table 5. Maine Conventional Milk Industry Cost of Production Study, 2019. Average Costs of Milk Production per Hundredweight (cwt). 2019**

<b>Maine Conventional Milk Industry Cost of Production Study, 2019</b>					
	<b>Tier 1</b>	<b>Tier 2</b>	<b>Tier 3</b>	<b>Tier 4</b>	<b>Overall</b>
No. farms completing study	16	12	3	5	36
Average Cash Operating costs – Short Run Break Even (SRBE)	\$23.05	\$21.44	\$20.93	\$20.21	\$21.94
Average Cash Operating costs (SRBE) + depreciation*	\$25.38	\$23.33	\$24.81	\$21.56	\$24.12
Average Cash Operating costs (SRBE) + depreciation + mgt** +unpaid family labor***	\$34.91	\$25.61	\$25.82	\$21.76	\$29.22
*A measure of total depreciation including section 179 **Management fee for the owner was valued at \$37,000 ***Unpaid family labor is valued at \$11 per hour					

## Discussion

### Challenges and Acknowledgements

During the conduct of the current study, collecting detailed information from farms was made more difficult by the numerous systems each business uses for accounting of costs. Some farms had non-milk producing enterprises within the farm accounting system; these farms were further interviewed to separate out these costs. Every attempt was made to normalize the costs into categories that could be used for our analysis. A big thank you goes out to the producers who cooperated in the study for the time and effort they spent to gather data for this study.

### Comparative Analysis

Costs of production on a dairy farm change with the economy. When the milk price is low, farmers tighten their belts and minimize their expenses, resulting in a decrease in the cost of production. In times of higher milk prices, producers have more income to put into improving land productivity, facility improvements, etc. and cost of production rises.

An illustration of this is shown in Table 6 which pulls numbers from the 2023 Farm Credit East Northeast Dairy Farm Summary for the years 2015 to 2019 (Laughton, Chris, 2023). It is important to note that the average herd size is much larger in these summaries than Maine herds and covers a much wider northeast geographic region. The Farm Credit East cost of production is from 267 herds with an average 600 cows (roughly 3.25 times the size of the average Maine dairy herd). The numbers are included only to illustrate that as milk price changes, the net cost of milk production changes as well (ie. when milk price increases, cost of production often increases and vice versa).

**Table 6. Cost of Production Variation and Relation to Milk Price, accrual basis. Northeast Dairy Farm Summary 2022 and 2023 Mid-Year Outlook, Farm Credit East.**

	2018	2019	2020	2021	2022
Milk Price/cwt	\$17.19	\$19.18	\$18.48	\$19.21	\$26.66
Adjusted Cash Operating Expense	\$18.60	\$18.59	\$19.29	\$19.79	\$24.29
Net Cost of Milk Production	\$17.72	\$17.81	\$18.11	\$18.60	\$22.87
Avg No. Cows per Herd	478	600	685	568	821

Farm Credit East has previously done a breakdown of New York versus New England herds in their financial summary. That calculation was not done in their 2022 Northeast Dairy Farm Summary.

In all the studies that are compared with the current Maine data, studies use the term adjusted cash operating expense and this is very close if not identical to the Maine definition of short run break even. In an effort to standardize the definition of Short Run Breakeven (SRBE) costs, we are specifying exactly what and what was not included and how each calculation was done for use with future studies. The purpose of this is to set a precedent for a clear and consistent definition for future SRBE analyses and provide an opportunity for data comparison across Cost of Production studies.

The Cornell Dairy Farm Business Summary Analysis Program (Karszes and Augello, 2023) reports summary financial information for the dairy herds enrolled in their program. Their 2022 summary evaluated 32 herds that were less than 500 milking cows with data for both 2021 and 2022. Those herds averaged 252 milking cows per herd and had an average operating expense of \$20.87 in 2022. That compares with the Farm Credit East financial summary with an adjusted cash operating expense of \$24.29

for the northeast compared with the average for Maine herds in the current Maine Cost of Production study of \$28.49, an increase of \$4.20 per hundredweight above the Farm Credit East average and \$7.62 above the Cornell average reflecting differences in variable expenses. In both studies, herd size was much larger for the Cornell program herds than the average Maine dairy herd 194.35 milking cows.

The United States Department of Agriculture Economic Research Service (USDA-ERS) calculates milk production costs using a 2021 base by state and was last calculated 10/2/2023 (<https://www.ers.usda.gov/data-products/milk-cost-of-production-estimates.aspx>). In the last study, Maine data was included, but no New England states are included in the most recent estimate.

USDA-ERS also does a comparison of milk production costs in various regions of the United States (<https://www.ers.usda.gov/data-products/commodity-costs-and-returns.aspx>) that was last calculated on 10/2/2023. Maine is included in the Northern Crescent region (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New Jersey, New York, Michigan, Wisconsin and portions of Minnesota, Ohio, Pennsylvania and Maryland). Pulling similar numbers (operating cost + hired labor + taxes and insurance + general overhead) from their estimates results in an average cash cost of production for the Northern Crescent states of \$22.69 assuming an average herd size of 170 milking cows and production per cow of 22,931 lbs of milk. That average production is \$5.80 lower than the Maine average.

It is important to compare changes in Maine with the larger geographic region that includes some Maine data. The Northeast Dairy Farm Summaries produced by Farm Credit East are the best source of that information.

Purchased grain cost is one of highest expense categories on a dairy farm. Review of the Farm Credit East data and our Maine data illustrates the higher cost of purchased feed per hundredweight (cwt) of milk produced. The Northeast Dairy Farm Summary for 2023 published by Farm Credit East reports that feed cost per cwt was lower for 139 Farm Credit East farms at \$8.04. Purchased feed cost per cwt of milk from the current study was \$9.73 for all Maine farms (purchased feed cost per cwt milk was \$8.68, \$10.71, \$9.48, and \$10.91 for Tiers 1 through 4, respectively) in the current study which is \$1.69 higher than the Farm Credit East regional average. The difference in feed cost per hundredweight is one component of a higher cost of milk production in Maine compared with herds in the Cornell summary with an average feedcost per cwt of \$8.01, a difference of \$1.72. Comparison of the change in feed cost per cwt for Northeast Farm Credit East farms saw an increase of 27.6% from 2019 (\$6.30) to 2022 (\$8.04) for Northeast Farm Credit farms while that increase for Maine farms was 31% using data from the Maine Milk Commission studies (\$7.43 in 2019 and \$9.73 in 2022). These data comparisons help illustrate the differences in cost of production across the region as well as the change over time and how relative changes in the Maine study compare with changes in a broader geographical region.

Several other universities have dairy farm financial recordkeeping programs and publish annual summaries of those farms. Most of these summaries have not been published for 2022 data as this report was written. One summary that is available is an overview of Pennsylvania dairy farms using data from Horizon Farm Credit and data collected by Penn State Extension (Pennsylvania Dairy Performance Indicators: 2022 Baseline). The net cost of production (including depreciation) for 196 conventional herds was \$22.94 which compares with the Maine data at \$30.55 for 31 project herds and Cornell data for farms with less than 500 cows of \$22.79, a difference of \$7.61 for the Pennsylvania herds and \$7.76 for the Cornell project herds.

States other than Maine compared in this report were as a result of farms being involved in a detailed farm recordkeeping program. It is difficult to accurately compare components of costs of production among state summaries due to differences in data summarization procedures. The Maine results were calculated in a retrospective study using several different recordkeeping systems so these results should

be treated as general and point to areas for further detail in future cost of production studies. Even with these differences, it is interesting to see how Maine farms compared with dairy farms in the southern northeast region of the country. The Maine study summarized data from 30.1% of the conventional farms in Maine.

## **References**

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USDA-ERS Commodity Costs and Returns. Milk <https://www.ers.usda.gov/data-products/commodity-costs-and-returns.aspx>

USDA-ERS Milk Cost of Production Estimates. Recent Milk Cost of Production Estimates-2016 Base. By State. <https://www.ers.usda.gov/data-products/milk-cost-of-production-estimates/>

**Appendix 1**

**Please fill out and return in the enclosed Stamped Envelope**

Farm Code \_\_\_\_\_

What was the average number of milking cows in your herd for the calendar year 2022? \_\_\_\_\_

What was the average number of heifers <12 mo old \_\_\_\_\_ and over 12 mo \_\_\_\_\_ in 2022?

Please indicate the pounds of milk shipped in 2022 \_\_\_\_\_ Did you also sell milk retail? If so, how many lbs were sold? \_\_\_\_\_ (this is to get total production for the year).

Which company markets your milk? \_\_\_\_\_ Which company hauls your milk? \_\_\_\_\_

From whom do you get your milk check and other payments? Co-op or Processor Name: \_\_\_\_\_

What type of financial recordkeeping system do you use? Check One.

\_\_\_\_ Farm Account book                      \_\_\_\_ QuickBooks or other software package  
\_\_\_\_ Check book ledger                      \_\_\_\_ Other? (Please indicate) \_\_\_\_\_

Do you use a pasture based grazing system? Yes \_\_\_ No \_\_\_ Number of acres of pasture \_\_\_\_\_

If Yes, do you use pasture for Milk Cows \_\_\_ Dry Cows \_\_\_ Heifers \_\_\_ (check all that apply)

Number of acres of Grass/legume for hay or silage \_\_\_\_\_

Do you grow corn silage? Yes \_\_\_\_\_ No \_\_\_\_\_ If yes, how many acres? \_\_\_\_\_

Do you purchase corn silage? If Yes, \_\_\_\_\_ tons Purchase Grass Silage? \_\_\_\_\_ tons Purchase Hay? \_\_\_\_\_ tons

If you grow corn silage, do you use cover crops in the Fall? Yes \_\_\_\_\_ No \_\_\_\_\_

Are you enrolled in a production record keeping system such as DHIA or some other computerized herd record keeping system? Yes \_\_\_ No \_\_\_ If No, why not? \_\_\_\_\_

Number of full time hired (non family) employees \_\_\_\_\_ (fulltime is 57 hr/wk for 50 wks/yr)

Number of full time family labor workers not including the owner # Paid \_\_\_\_\_ # Not Paid \_\_\_\_\_

Do you milk in/with a separate parlor \_\_\_ flat barn parlor \_\_\_ pipeline \_\_\_ or bucket milker \_\_\_?

Do you feed a total mixed ration to your milking herd \_\_\_ or feed forage and grain separately \_\_\_?

Have you made any management changes to respond to PFAS concerns? \_\_\_\_\_

What do you pay/hr for general farm labor? \_\_\_ Do you offer benefits to farm employees? Y N

Do you provide housing or transportation for farm employees? \_\_\_\_\_