Canadian Dairy Commission

Commission canadienne du lait

Cost of Production

Result based on 2023 survey data

Indexed to three months ending August 2024

2024

CANADIAN DAIRY COMMISSION

Canada

2023 Cost of production (COP) Summary

The Canadian Dairy Commission (CDC) carries out the cost of production **(COP)** survey annually to measure the on-farm cost of producing milk.

The results of the COP survey are measured in dollars per hectolitre (100 litres) of milk produced. The 2023 COP results are **indexed to August 2024**, and along with the Consumer Price Index (CPI), are used to determine the adjustment (as a percentage) to be applied to producer revenues. The National Pricing Formula (NPF) is calculated as 50% of the year-over-year change in the iCOP plus 50% of the year-over-year change in CPI. This means that an increase in the **indexed cost production (iCOP)** does not necessarily lead to an increase in the price of milk at the farmgate, or vice versa.

It is important to note that it is the *change* between years that determines the price change, not the absolute values of the iCOP and CPI.

As shown in **Table 1**. the iCOP for one standard hectolitre of milk indexed to August 2024 is **$90.36/std hl**. This result is used in the annual adjustment to the farmgate price of milk, which is announced no later than November 1 each year and takes effect the following February.[1]

For more information on how the COP survey is conducted, the COP methodology, calculation, efficiency measures, and how the results affect pricing, please read the CDC's publication on COP process.

Table 1. iCOP results

	iCOP indexed to August ($ / std hl)
2024 iCOP	$90.36
2023 iCOP	$93.09
% Change year-over-year	-2.93%

[1] Although farms sell milk, dairy processors purchase the components (protein, butterfat, and other solids) of milk. Processors in turn process those components into finished dairy products. From there, prices are determined by the market where supply, demand and other factors influence prices. The retail price of dairy products is not federally regulated in Canada. However, some provinces do regulate the retail price of fluid milk.

Non-indexed 2023 COP results

The data used in calculating the cost of producing milk in Canada are collected from farms by two independent accounting agencies who then verify and organize the data. The CDC uses this data to calculate the COP.

The first figure calculated is the non-indexed 2023 COP shown in **Table 2.** This figure is expressed in standardized hectolitres.

Table 2. Non-indexed COP

	COP ($ / std hl)
2023 non-indexed COP	$92.60

2023 sample

A total of 254 farms across the country were sampled for data collection during the 2023 calendar year. Of those, 244 farms were used for the final calculation (10 outliers in the data were excluded). The sample size increased by 16 farms compared to the previous year as part of a plan to increase the sample size to 270 farms over the course of three years. National production shares of the sample are shown in **Table 3**. More information on the COP sampling methodology can be found here.

Table 3. Non-indexed COP

	Maritimes	QC	ON	West	Canada
Farms sampled					254
Excluded farms					10
Number of farms selected	13	100	81	60	244
National production share of sample 2023	5.0%	37.5%	32.9%	24.6%	100%
Butterfat content of milk (kg/hl)	4.34	4.17	4.12	4.33	4.20
Solids non fat content of milk (kg/hl)	9.14	9.00	8.85	9.21	9.01

Table 4 below shows the distribution of the COP sample by housing system, milking system, business type, and income tax filing type. The final column demonstrates the percentage change in the share of each attribute in the sample, year over year.

The 2023 results show a continued evolution in farming methods used in the dairy sector. Significant changes took place in housing systems in sampled farms as a new Code of Practice for the Care and Handling of Dairy Cattle was finalized by the National Farm Animal Care Council. This mandatory code of practice prohibits cows from being tethered continuously through the production cycle and requires that new barns allow freedom of movement year-round.[2]

At the same time, farms in the sample continued to implement robotic milking systems at a steady pace, motivated by potential productivity gains associated with the new milking systems.

Table 4. Attributes of farms in COP sample*

System	Type	Number	Change in Share of Total, 2023 vs 2022
Housing System	Tie Stall	80	-14.1%
	Free Stall	164	26.1%
	Loose Housing	9	-11.9%
	Other	1	0.0%
Milking System	Manual milking	0	0.0%
	Automatic milking and pipeline	100	-4.9%
	Automatic milking and parlour	68	1.9%
	Robotic milking	57	3.8%
	Other	1	-0.8%
Business Type	Standard	247	0.8%
	Organic	6	-0.3%
	DHA	1	-0.5%
	Other	0	0.0%
Income Tax Type	Sole proprietor	13	-0.6%
	Partnership	53	-6.6%
	Incorporated	173	5.7%
	Other (Colony)	15	1.5%

The information shown in **Table 4 represents the COP sample only. For select farm statistics for all farms in Canada, visit the CDIC website.*

[2] National Farm Animal Care Council: Updated code of practice

Standardization

Data is provided to the CDC based on the actual composition of milk on the farm. However, the composition of milk varies from farm to farm and year to year. The use of a standard milk composition allows for direct comparisons. Actual figures are converted to standardized figures at the end of the process using the most recent component standards included in **Table 5**.

Table 5. Standards used in the 2023 COP calculations

	Butterfat	Solids non fat
Allocation of COP[3]	45%	55%
Milk standard composition	3.6 kg/hl	8.9177 kg/hl
Sample milk composition[4]	4.202 kg/hl	9.012 kg/hl

To illustrate the standardization calculation using the data from **Table 5**, we calculate the adjustment needed for a hypothetical non-standardized cost of $1.25:

$$\$1.25/hl \times \left(\left(45\% \times \frac{3.6}{4.202}\right) + \left(55\% \times \frac{8.9177}{9.012}\right)\right)$$

$$= \$1.16/std\ hl$$

Margin of error

The COP survey uses a random sampling of farms throughout the country with specific targets for regions and farm sizes. Because the COP results are based on a sample, and not the full population of dairy farms in the country, it is expected that there will be a slight difference between the population level COP and the sample-based COP.

The margin of error is a statistical indicator. It indicates that 19.5 times out of 20, a different random sample of farms would be within the defined range. The margin of error for the 2023 COP was 2.28%.

Table 6. Margin of error for 2023 COP sample

2023 sample	%	$/hl
Margin of error	2.28%	$2.27

[3] The allocation between butterfat and SNF is determined by the rolling three-year average butterfat portion of total revenues and SNF portion of total revenues, which together equal 100% of revenues.

[4] Weighted average composition of all eligible farms.

To note

This is the first year that the sample size has increased towards the new target of 270 farms. The CDC will continue its goal of increasing the number of farms in the sample over the coming two years. Over time, the CDC anticipates increased stability within the sample and an improved margin of error. The ultimate objective is to reduce the margin of error below 2% and improve the representativeness of the farms.

COP Highlights ($/std hl)

The unindexed cost of production for one standard hectolitre of milk in 2023 was **$92.60/std hl**. This represents a decrease of -0.4% compared to the unindexed 2022 cost of production (see Table 7).

This small overall change is the effect of two trends that largely cancel out: an increase in capital costs driven by higher interest rates and an easing of producer labour and some cash cost pressures, on a per hl basis.

Table 7. 2023 COP costs* compared to 2022

	2022 COP $/std hl	2023 COP $/std hl	$/std hl change	% change
Cash costs	55.81	55.16	-0.65	-1.2%
Capital costs	17.69	19.44	+1.75	+9.9%
Producer labour costs	19.46	18.17	-1.29	-6.6%
Government rebates and other	-0.01	-0.16	-0.15	1,500%
Total COP	**92.95**	**92.60**	**-0.35**	**-0.4%**

*The results shown in **Table 7** are the result of the survey, **non indexed**, in $/standard hectolitre. Non-indexed results **must be indexed** before they can be used for pricing.

Costs which changed the most in $/hl terms in 2023 compared to 2022 are shown in **Table 8**. For the full table of costs, see **Appendix 1**.

Table 8. 2023 COP results - Select costs, 2023 compared to 2022

2023 COP	2022 COP $/std hl	2023 COP $/std hl	%change 2023/2022	$/std hl change 2023/2022
Purchased feed	22.98	23.26	1.2%	0.28
Fuel & lubricants	2.92	2.51	-14.0%	-0.41
Fertilizer, herbicides, pesticides	2.60	2.37	-8.8%	-0.23
Transportation, fees and promotion	5.63	5.92	5.2%	0.29
Machinery & equipment repairs & maintenance	3.55	3.72	4.8%	0.17
Hired labour	3.73	4.28	14.7%	0.55
Interest paid	3.71	5.11	37.7%	1.40
Producer labour	19.46	18.17	-6.6%	-1.29
All other costs	28.37	27.26	-3.9%	-1.11
Total COP	**92.95**	**92.60**	**-0.4%**	**-0.35**

As seen in **Table 8**, increases in certain costs such as interest and hired labour were offset by other costs that decreased, notably producer labor as well as the prices of fuel and fertilizers, leading to a slight overall reduction in production costs.

Between 2022 and 2023, interest rates in Canada increased to combat rising inflation, reaching a rate of 5% by the summer of 2023. This had a significant impact on mortgage rates and borrowing costs, causing interest paid by farms in the sample to rise from $3.71/hl to $5.11/hl in 2023, a 37.7% or $1.40/hl increase.

The costs related to producer labor decreased by 6.6%, from $19.46/hl to $18.17/hl, a reduction of $1.29/hl. This decrease can be attributed to easier access to hired labour compared to conditions in 2022, and to improvements in labour productivity. The decrease in producer hours was partially offset by an increase in the hourly rate used to assign a cost value to producer labour, as the hourly wage for a Government of Canada employee working in agriculture increased by 8.5% in 2023.

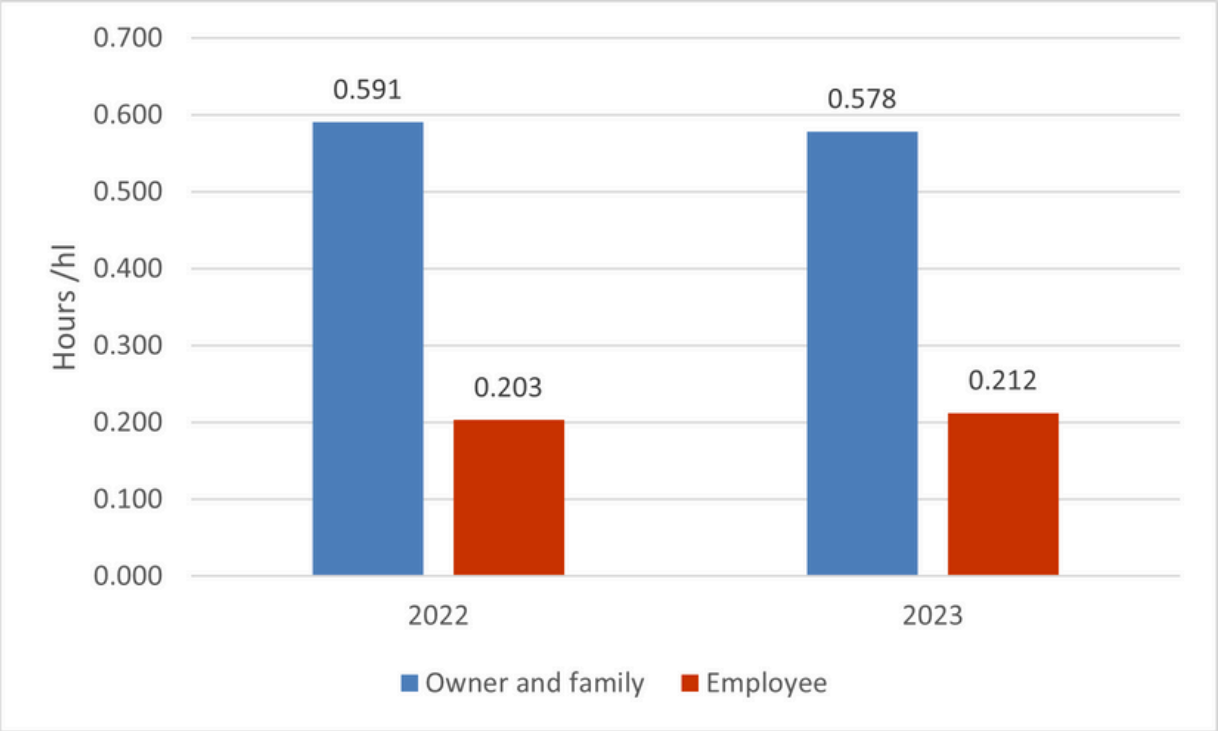
Conversely, the costs related to hired labour increased by 14.7%, from $3.73/hl to $4.28/hl, an increase of $0.55/hl. This is explained by a transfer of working hours from owners to employees and by an increase in average wage rates from 2022 to 2023. Several producers in the sample mentioned that, to ensure they retain their employees they had transferred some of their working hours to the latter. Additionally, shifts in the labour market made it easier for producers to hire, as the job vacancy rate in the animal agriculture sector dropped significantly between 2022 and 2023.[5]

5 AAFC Report: *The state of labour in agriculture and agri-food*

The changing structure of on-farm labour is seen in **Figure 1**, demonstrates how the use of labour has changed year-over-year on farms within the sample. The modest gains in productivity as well as the transfer of producer labour towards hired labour are both seen in the indicators.

In 2023, milk production increased by 1.5% compared to 2022 on a fluid basis[6] in order to meet growing market demands. For many producers this increased volume would have reduced fixed costs on a per hectolitre basis, especially if the increased volume was produced using the same livestock and capital asset base. The apparent gains in productivity associated with increased volumes would not necessarily carry forward into the future, as production volumes tend to show some volatility year-over-year.

Figure 1. Labour and productivity indicators - Hours reported per hl produced



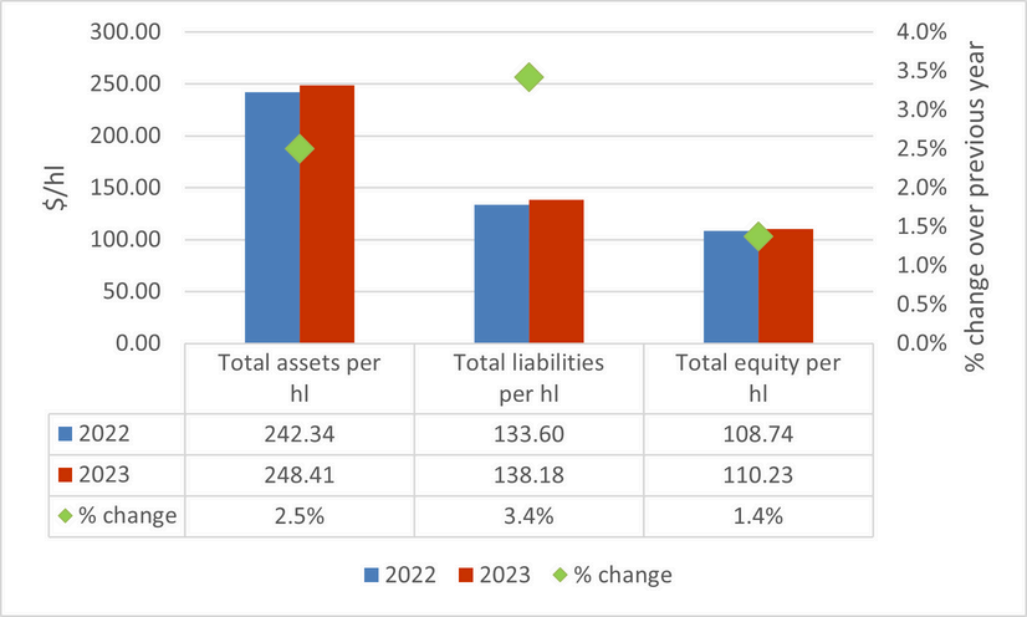
*Source: Canadian Dairy Commission calculations.

Another factor contributing to a reduction in total costs was a strong market for cull cows, as revenues from the sale of surplus livestock are deducted from the COP (after an adjustment to account for the change in capital assets).

Figure 2 shows the typical financial position of surveyed farms, which are showing results in 2023 that are very consistent with data from 2022. This stability suggests that the rate of net new investment was slow in 2023, which is unsurprising given the interest rate environment. The results also show good financial health for many of the surveyed farms, as liabilities and net equity were stable year-over-year.

[6] Canadian Dairy Information Centre: *Historical Milk Production*

Figure 2. Financial indicators - evolution of assets, liabilities and equity



	Total assets per hl	Total liabilities per hl	Total equity per hl
2022	242.34	133.60	108.74
2023	248.41	138.18	110.23
% change	2.5%	3.4%	1.4%

*Source: Canadian Dairy Commission calculations.

Efficiencies found on farm, strong market for cull cows, and lower input costs helped to alleviate inflationary pressures in the COP, despite 2023 being an environment above Canada's target inflation rate.

Indexation of the 2023 COP to August 2024

The 2023 COP survey is used to calculate milk prices effective February 1st, 2025. To ensure that results from 2023 reflect the most recent trends available in specific cost variables, the 2023 COP is indexed to reflect today's reality more accurately (iCOP). The three-month period ending August 2024 is used for pricing calculations for February 1st, 2025.[7]

The following cost elements are indexed to the three months ending August 2024:

- Cash costs are indexed using Statistics Canada indices (see Appendix 2).
- The interest component is indexed using the Bank of Canada five-year mortgage rate (see Appendix 2).
- Producer labour and remaining components of capital costs are not indexed.

Highlights from COP indexation (iCOP) ($/std hl)

The 2024 iCOP result is **$90.36/std hl** (indexed to August). Relative to 2022 and 2023, 2024 trends indicate a slower pace for rising input costs, and for some indices, decreases compared to the base period (2023). The indexation of the 2023 COP ($92.60/hl) to the most recent 3 months ending August 2024 yields a reduction to the COP of -2.42%. In absolute terms, **Table 9** shows that the COP decreases by $2.24/std hl due to indexation.

Table 9 outlines select costs which were impacted the most in $/hl terms by this year's indexation. For the full table of indexed costs, see **Appendix 1**.

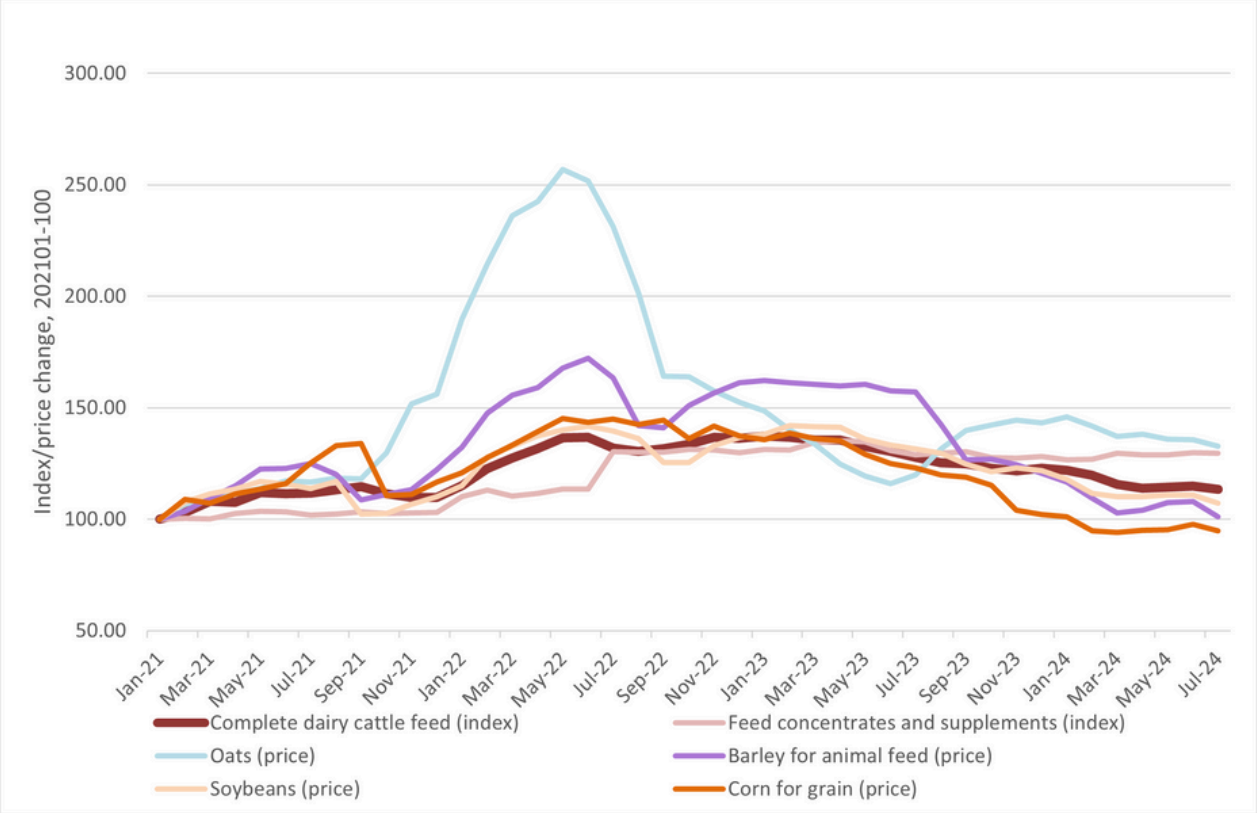
Table 9. COP Indexation

2023 COP - Select costs, indexed	2023 COP $/std hl	2023 iCOP $/std hl Indexed to August 2024	$/std hl change 2023/ August 2024
Purchased feed	23.26	20.41	-2.85
Transportation fees and promotion	5.92	6.16	+0.24
Fuel and oil	2.51	2.40	-0.11
Fertilizer and herbicides	2.37	2.25	-0.12
Land and building repairs	3.46	3.54	+0.08
Property taxes and insurance	2.53	2.63	+0.10
Hired labour	4.28	4.46	+0.18
Interest paid	5.11	5.18	+0.07
All other costs	43.15	43.33	+0.18
Result of COP formula	**92.60**	**90.36**	**-2.24**

[7] As per industry decision taken in 2019.

Purchased feed indexed downward by 12.3% compared to 2023 as strong crop yields reduced prices commonly used for feed, as seen in **Figure 3**. Corn prices steeply declined in 2023 to $220/tonne from $290/tonne in 2022. In 2024, the Chatham corn price declined further to $200/tonne.[8] Given that purchased feed accounted for 42% of the total cash costs and 25% of the overall standardized COP, this drop has a significant effect on the iCOP results, which are reduced by $2.85/std hl as a result in indexation.

Figure 3. Long term progression of feed index and component prices

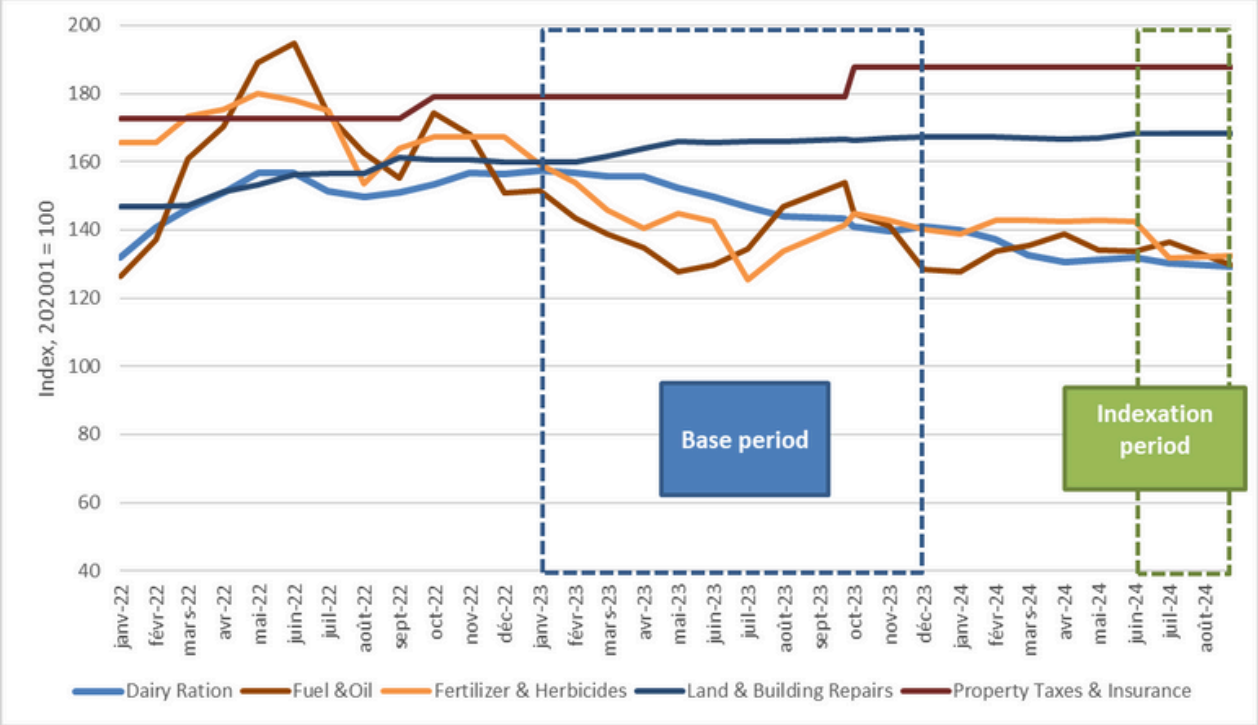


8 Source: Agriculture and Agri-Food Canada, Outlook for Principal Field Crops 2024

Figure 4 illustrates the evolution of selected indices, including purchased feed. Many inputs, including transportation costs, interest paid, property taxes, and insurance continue to index upwards. The magnitude of these increases, however, is small compared to the reduction in the iCOP caused by lower feed prices. For example, fuel and oil costs moved downward by 4.5%, fertilizer and herbicides down by 5.1%, while the hired labour index was up by 4.2%, property taxes and insurance increased by 3.6%, and transportation and fees increased by 3.9%.

While retail prices for gasoline in June-August 2024 remain above the base period, average retail prices for diesel have declined by 4% in the indexation period.[9] Potash, an important ingredient in fertilizer, decreased by 22% in the indexation period compared to the 2023 average.[10]

Figure 4. Evolution of selected indices



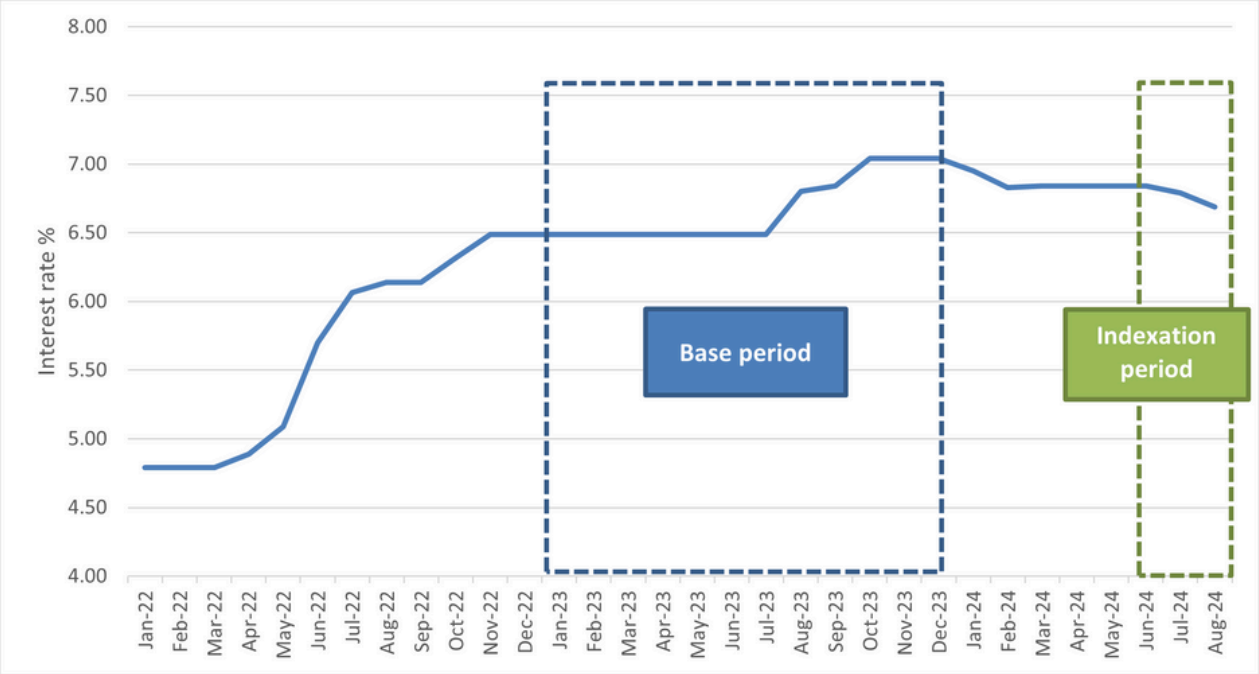
*Source: Statistics Canada

9 Statistics Canada: Monthly average retail prices for gasoline and fuel oil
Natural Resources Canada Average Retail Fuel Prices in Canada

10 Statistics Canada: Raw Materials Price Index

Figure 5 shows the monthly average interest rates for a conventional 5-year mortgage in Canada from the base period of the 2023 calendar year compared to the most recent 3 months available data, i.e., June through to August 2024. This reference is used as an index to adjust interest paid under capital costs in the COP. The rate increase compared to the base period of 2023 indexes the COP upwards by $0.07/std hl (see Appendix 1).

Figure 5. Monthly average interest rates, conventional 5-year mortage



*Source: Bank of Canada conventional 5-year mortgage rates. https://www.bankofcanada.ca/?p=205791

Prices for the majority of inputs have been stable from 2023 through 2024, the overall impact of the indexation process excluding purchased feed is small, especially in comparison to previous years where inflation rates were higher. The drop in feed prices, fertilizers, herbicides, pesticides, and fuel and lubricants were the primary drivers in this year's indexation, leading to a modest reduction between the 2023 COP and iCOP.

Certain COP costs are not indexed. For example, wages for return to management and producer direct labour along with interest rates applied to the return on equity are anticipated to increase in 2024 but are not captured in the 2023 iCOP.

Appendix 1

National Cost of Production Calculation
2023 Results

CASH COSTS	2023 COP $/hl	2023 COP Indexed to August $/hl	2022 COP Indexed to August 2023 $/hl	% change August 2024/August 2023
Purchased feed	23.26	20.41	22.44	-9.1%
Artificial insemination*	3.31	3.31	3.30	0.3%
Transportation, fees & promotion	5.92	6.16	5.76	7.0%
Machinery, equipment repairs	3.72	3.75	3.87	-3.3%
Fuel & oil	2.51	2.40	2.45	-2.2%
Custom work	2.81	2.89	2.95	-2.0%
Fertilizer & herbicides	2.37	2.25	2.05	9.7%
Seed & plants*	1.30	1.30	1.33	-1.7%
Other (Misc): Professional fees	0.89	0.90	0.82	9.8%
Other (Misc): Animal costs	1.97	2.00	1.84	8.6%
Other (Misc): Crops costs	0.60	0.61	0.69	-11.6%
Land & building repairs	3.46	3.54	3.65	-3.0%
Property taxes & insurance	2.53	2.63	2.66	-1.2%
Hydro & telephone	1.79	1.82	1.87	-2.8%
Hired labour	4.28	4.46	3.86	15.4%
Purchase/sale of animals*	-5.32	-5.32	-3.56	49.3%
Dairy Inventory Value adjustment*	-0.24	-0.24	-0.65	-62.8%
Total Cash Costs	**55.16**	**52.85**	**55.32**	**-4.5%**
CAPITAL COSTS				
Interest paid	5.11	5.18	4.33	19.5%
Building depreciation*	3.81	3.81	3.59	6.2%
Machinery & equipment depr*	5.45	5.45	5.10	6.9%
Return on equity*	5.07	5.07	5.30	-4.4%
Total Capital Costs	**19.44**	**19.51**	**18.32**	**6.5%**
PRODUCER LABOUR				
Direct labour*	12.93	12.93	14.25	-9.3%
Return to management* (1)	5.24	5.24	5.21	0.5%
Total Producer Labour	**18.17**	**18.17**	**19.46**	**-6.6%**
GOV'T REBATES & OTHERS*	-0.16	-0.16	-0.01	-1613.7%
RESULT OF COP FORMULA	**92.60**	**90.36**	**93.09**	**-2.93%**

* Not indexed
(1) The rate of $53.14 per hour was used. It represents the mid-range AG-3 salary in 2023 .

Appendix 2

Description of indices used to update cash costs and interest component

COST COMPONENTS	2023	August	% change August / 2023
Dairy Ration	148.6	130.3	-12%
Transportation,fees & promotion	3.58	3.7	4%
Mach,Equip Repairs	130.4	131.2	1%
Fuel &Oil	139.6	133.4	-4%
Custom Work	157.1	161.8	3%
Fertilizer & Herbicides	142.8	135.6	-5%
Other (Misc)	125.6	127.5	2%
Land & Building Repairs	164.7	168.3	2%
Property Taxes & Insurance	181.2	187.8	4%
Hydro & Phone	148.0	150.6	2%
Hired Labour	43.2	45.0	4%
Interest	6.7	6.8	1%

Dairy Ration		Statistics Canada. Table 18-10-0266-01 Industrial product price index, by product, monthly. Complete dairy cattle feed [1811211]. Index, 202001=100.
Transportation		P5 Transportation Pooling Figures/Chiffres du pooling P5 pour le transport
Mach,Equip Repairs	v1230996240	Statistics Canada. Table 18-10-0266-01 Industrial product price index, by product, monthly. Canada; Agricultural, lawn and garden machinery and equipment. Index, 202001=100.
Fuel &Oil	v1230996147	Statistics Canada. Table 18-10-0266-01 Industrial product price index, by product, monthly. Canada; Energy and petroleum products. Index, 202001=100.
Custom Work	v41690973	Statistics Canada. Table 18-10-0004-01 Consumer Price Index, monthly, not seasonally adjusted. Canada;All-items. 2002=100.
Fertilizer & Herbicides	v1230996090	Statistics Canada. Table 18-10-0266-01 Industrial product price index, by product, monthly. Canada; Fertilizers, pesticides and other chemical products. Index, 202001=100.
Other (Misc)	v1230996007	Statistics Canada. Table 18-10-0266-01 Industrial product price index, by product, monthly. Canada; Total, Industrial product price index (IPPI). Index, 202001=100.
Land & Building Repairs	v41691060	Statistics Canada. Table 18-10-0004-01 Consumer Price Index, monthly, not seasonally adjusted. Canada;Homeowners' maintenance and repairs. 2002=100.
Property Taxes & Insurance	v41691058	Statistics Canada. Table 18-10-0004-01 Consumer Price Index, monthly, not seasonally adjusted. Canada;Property taxes and other special charges. 2002=100
Electricity	v41691063	Statistics Canada. Table 18-10-0004-01 Consumer Price Index, monthly, not seasonally adjusted. Canada;Electricity. 2002=100. The indice accounts for 80% in the indexation of the Hydro and Phone.
Telephone	v41691070	Statistics Canada. Table 18-10-0004-01 Consumer Price Index, monthly, not seasonally adjusted. Canada; Telephone services. 2002=100. The indice accounts for 20% in the indexation of the Hydro and Phone.
Hired Labour	v1602417	Statistics Canada. Table 14-10-0209-01 Average hourly earnings (including overtime) for salaried employees, by industry, monthly, unadjusted for seasonality. Canada; Industrial aggregate excluding unclassified (Dollars).
Interest		The interest component is indexed using the Bank of Canada 5-year mortgage rate.

Appendix 3

Farms number and total production share

	# of farms [1]	National production share (litres) 2023
Maritimes	12	4.98%
Quebec	99	37.54%
Ontario	74	32.87%
West	60	24.61%
Canada	245	100.00%

[1] Excluding outliers