Process for the Annual Cost of Production Survey and Pricing Milk at the Farm Level

by the Canadian Dairy Commission

Canadian Dairy Commission | Commission canadienne du lait

This document presents an overview of the annual Cost of Production (COP) survey conducted by the Canadian Dairy Commission (CDC), outlining how the survey is conducted, and how the annual COP results impact the annual price adjustments announced by the CDC. For more information on the results, click here.

1 - About the Cost of Production Survey

In accordance with the *Canadian Dairy Commission Act*, the Canadian Dairy Commission (CDC) carries out the COP survey annually to measure the on-farm cost of producing a hectolitre of milk (100 litres). The indexed cost of production (iCOP) figures are used to set milk prices.

There is a lag between the time the COP survey is completed and the time the data is used in pricing calculations. To ensure the COP data are representative of the time period in which they are used, results are indexed forward using the latest available data.

Two independent accounting agencies collect, verify, and organize the data from sample farms: Groupe Agéco for the Eastern provinces, and MNP for the Western provinces.

CDC Mandate

Provide efficient producers of milk and cream with the opportunity of obtaining a fair return for their labour and investment and to provide consumers of dairy products with a continuous and adequate supply of dairy products of high quality.

2 - Sample design

The COP sampling methodology was designed in consultation with Statistics Canada to ensure its validity. A minimum of 220 farms participate in the survey. Furthermore, there is a minimum regional sample size to ensure representation from each region of Canada.

The sample is divided based on regions and farm sizes to be representative of milk production across Canada. There are four regions:

*Newfoundland and Labrador does not take part in the COP survey.

Each region's farms are then divided into small, medium, large, and extra-large farms, except in the Maritimes, where the small number of farms make it difficult to maintain confidentiality if divided into more than small, medium, and large.

The COP survey is only statistically significant at the national level and cannot be broken down into regional costs of production. A larger sample would be needed to have regional validity.

3 - Farms included in the sample

Farms commit to participate in the survey for five years, with approximately 20% of each year's sample being newly added farms. Provincial milk marketing boards provide a list of all farms in Canada along with their monthly production to the CDC. To be eligible, farms must:

- Have produced milk in every month of the previous dairy year.
- Not be located in excluded zones. Excluded zones are areas that are considered too remote for data collection and are typically home to few dairy farms.
- Not be amongst the 3% largest farms by production or the 3% smallest farms by number of farms in their region.

Recruiting

- New farms are recruited in the fall for next year's survey.
- For each farm needed, the COP website randomly generates a list of 7 farms.*
- Data collection agencies contact farms, starting with the first in the list.

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Farms

- Farms that decline to participate are not eligible to be contacted again for 3 years.
- Farms that are not contacted go back into the main pool and can be randomly selected again at any time.
- Farms that agree sign a letter of agreement with the CDC.

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Agreement

- Farms commit to taking part in the annual study for 5 years.
- The agreement ensures that their data will be kept confidential.
- After 5 years the farm cannot be contacted during the following 3 years.

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*For example, if a region needs to recruit two small farms to reach its minimum requirement, a random list of 14 small farms in that region is generated.

To assist farms in compiling data, the data collection agencies conduct in-person and/or virtual visits to farms at least twice in their first year in the survey and at least once a year after that. Data collectors assist producers in providing accounting information that is required in the survey.

At the end of the calendar year, they collect full data required for the COP (much of the data is organized when taxes are done).

These agencies must carefully follow the methodology contained in the manual for COP data collection, which includes detailed methodology on accounting and COP costs.

The data collection agencies verify, organize, and enter farm data into a template that is forwarded to the CDC. They use an assigned identification number that keeps their identity confidential.

4 - Type of costs

Included costs

The COP encompasses three main types of costs directly related to the dairy enterprise: cash costs, capital costs, and producer labour.

A fourth element - government grants relating to the cost of production - is then subtracted from the other costs to arrive at the total cost of production. These only include amounts that reduce the cost of production, such as crop and livestock insurance premiums. Recently, some COVID-19 relief programs were included.

Cash costs

- Purchased feeds
- Veterinary services
- Electricity
- Taxes
- Milk transportation
- Machinery and equipment
- Custom work
- Fuel and lubricants
- Fertilizers, herbicides, pesticides
- Seeds
- Other crop costs
- Hydro and telephone
- Land and rebuilding (repair and maintenance)
- Purchase and sale of animals

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Capital costs

- Interest paid
- Return and equity (currently based on Bank of Canada rate for 5-year mortgage)
- Building and land depreciation

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Producer labour costs

- Management hours (valued at the mid-range salary of a person working in agriculture for the Government of Canada)
- Manual labour hours (costed using a provincial weighted average of the industrial wage rate as published by Statistics Canada)
- Survey participants keep time sheets to track the hours worked by the producer and his or her family.
- Fifteen percent of labour hours constitute management hours, and the remainder are treated as manual labour hours.

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Government grants

- Grants or rebates that directly reduce the cost of producing milk.
- These include crop and livestock insurance premiums, subsidies for certain activities and more recently, COVID-19 relief programs directly affecting milk production costs.

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Cost of Production

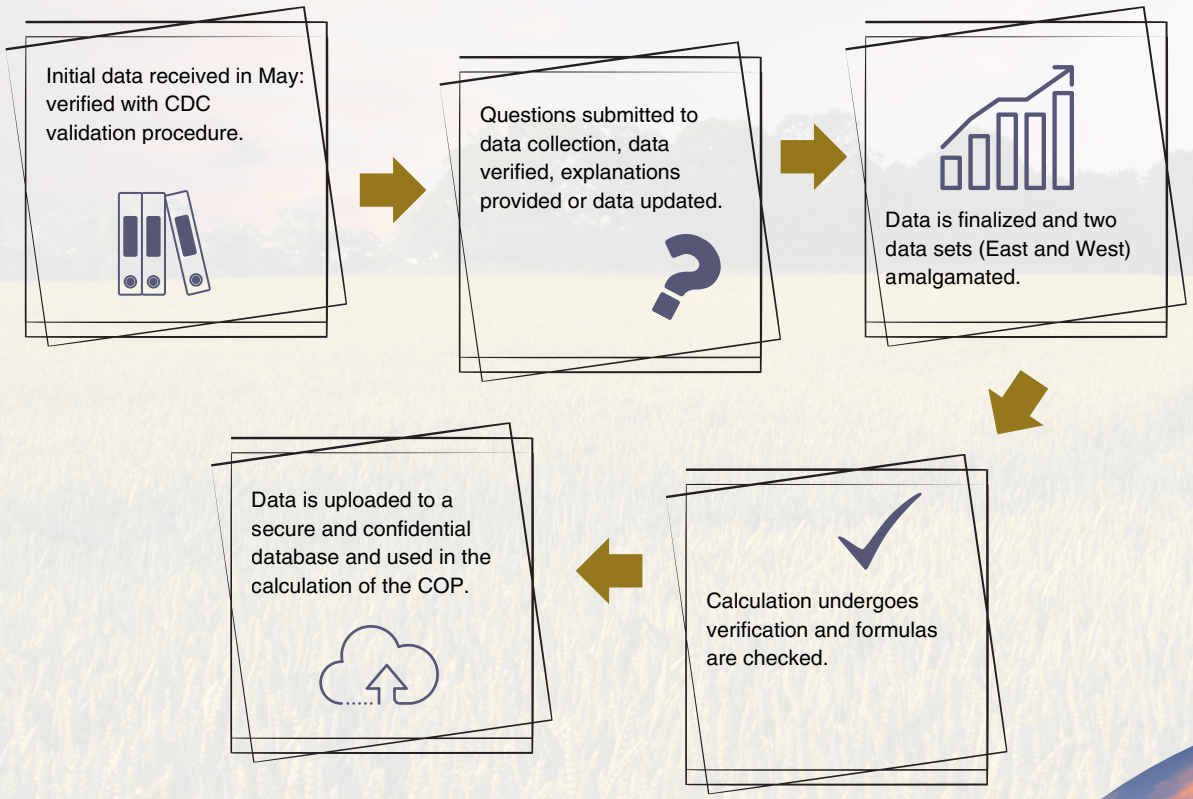
Excluded costs

The COP does not include the purchase of quota. Furthermore, if a farm has other business operations besides dairy, only figures directly related to the dairy enterprise are included in the COP data.

5 - COP calculation method and process

The CDC receives the initial COP data from the previous calendar year around May. The anonymous farm data is verified using the CDC's validation procedure. For example, data are compared with those of the previous year(s) for farms that are in their second year or more in the survey. Any questions regarding the data are submitted to the data collection agencies. Agencies verify the data and provide explanations or updates when necessary. When data have been finalized, the two datasets (East and West) are amalgamated and an automated calculation of the COP occurs. The calculation then undergoes thorough verification, including formula and reasonability checks.

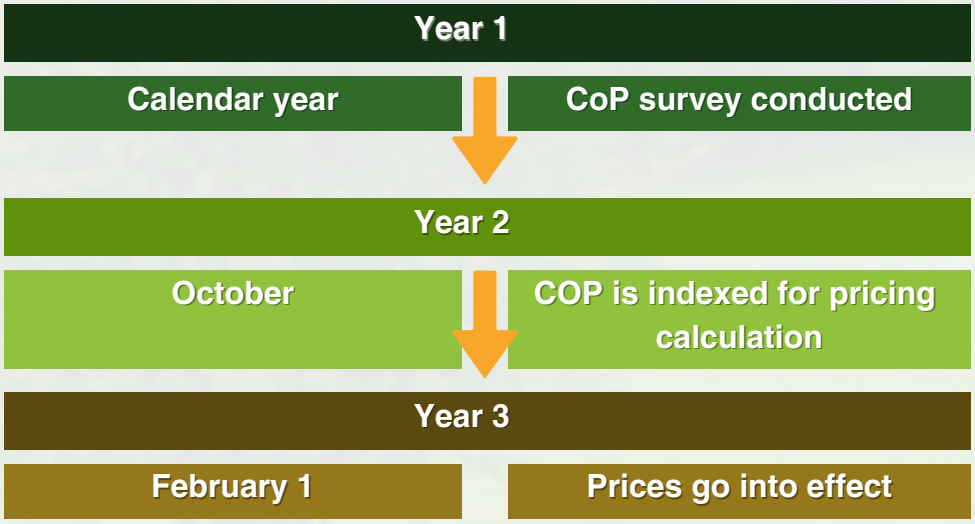
During the calculation, each farm is individually weighted. Correction factors are applied to ensure that each farm in the survey accurately represents its overall farm size and region based on actual production in its regional and size group. Farms that fall outside two standard deviations are deemed as outliers and are removed from the final calculation. The result is the COP for the year, the cost of producing one hectolitre of milk on the farm (not the cost per farm). For comparison and pricing purposes, this figure must be standardized*, then indexed.



*The use of a standard milk composition allows for year-over-year, international, and interprovincial comparisons. Actual figures are converted to standardized figures using milk standard composition (BF 3.6 kg/hl, SNF 8.9177 kg/hl). The COP data are provided to the CDC based on actual costs recorded. Standardization is only performed at the end of the process using the most recent component standards.

Indexation

Indexation is necessary to account for the lag between data collection and the timing of the pricing calculations performed by the CDC. Indexation is the process of updating data collected in one period to reflect the realities of another period. The COP process, from data collection to pricing implementation, occurs over a 25-month period.



Each year, certain costs in the COP are indexed to reflect cost variability over time, using data from Statistics Canada. The data in the COP survey were collected in the previous calendar year, but will be used the following fall to calculate a price adjustment that will be effective the next February 1, which is two years after data collection. Statistics Canada's Industrial Product Price Indices for June through August are used to index COP cost elements (for example, 2020 COP gets indexed through August 2021 to be used in February 2022 pricing). The final August indices are generally available the first week of October.

Other inputs to be updated include the rate of return on equity, as per the Bank of Canada 5-year mortgage rate, and the salary for return to management (aligned with an AG-03 mid-range salary in the federal public service).

See below the list of Statistics Canada indices used for the indexed Cost of Production, also available in the COP booklets.

- Dairy cattle feed
- Custom work
- Property taxes and insurance
- Hired labour
- Machinery and equipment repairs
- Fertilizer and herbicides
- Electricity
- Transportation
- Fuel and oil
- Land and building parts
- Telephone

6 - National Pricing Formula and Exceptional Circumstances

The National Pricing formula (NPF) is a pricing mechanism that was determined by the industry. It is typically calculated once a year for price adjustments in February. The indexed result of the cost of production survey, along with the Consumer Price Index (CPI), determines the change in percentage to producer revenues, whether the change is an increase or a decrease.

The NPF takes 50% of the year-over-year change in the indexed COP (iCOP), plus 50% of the year-over-year change in CPI. Thus, it is the change between years that matters, not the absolute value of the iCOP.

(50% of the variation in the iCOP) + (50% variation in the CPI)
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Price adjustment in %

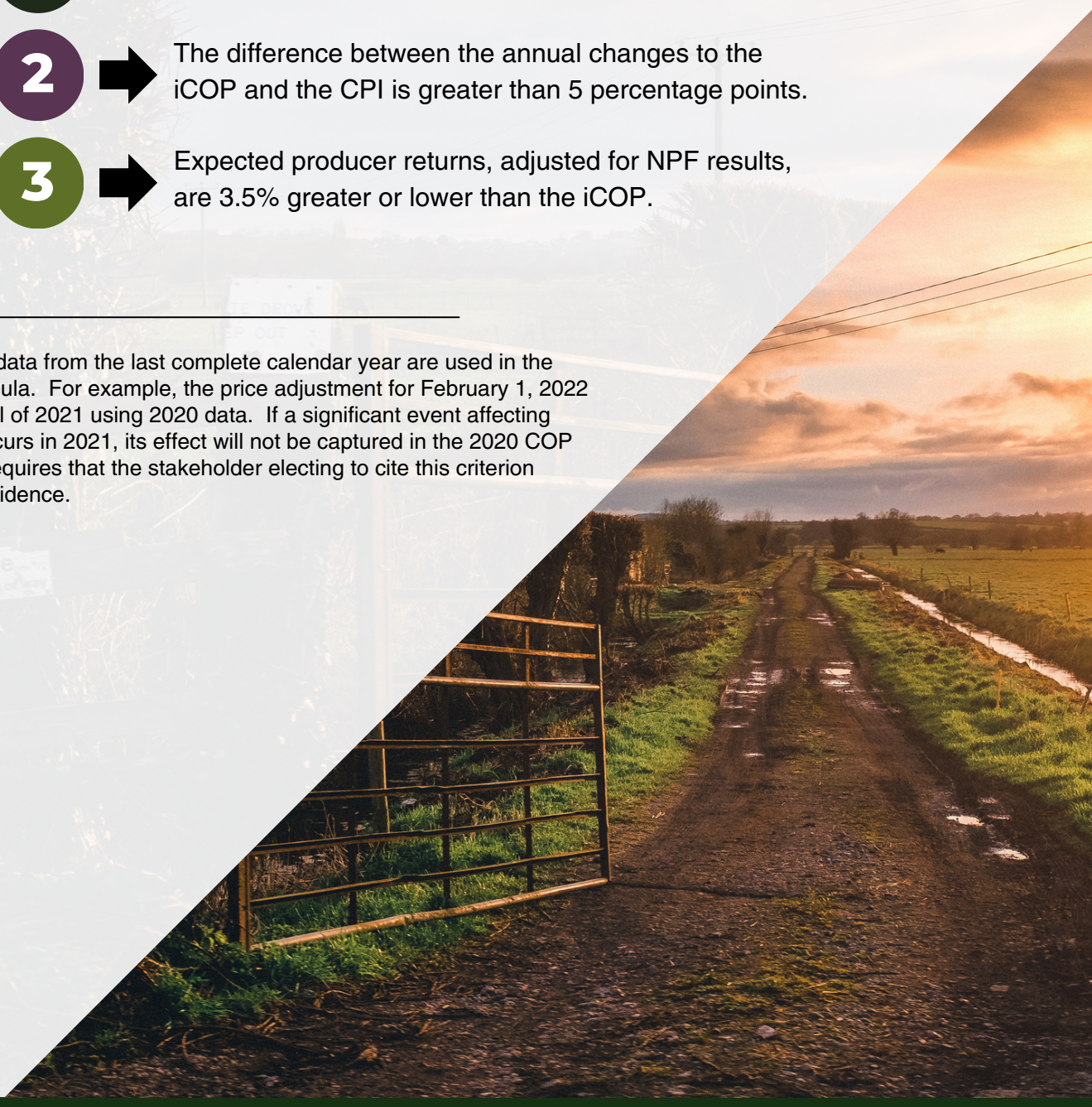
Example	iCOP	CPI
Year 1	100	100
Year 2	101	102
% variance	1%	2%
Weight in NPF (50%)	0.50%	1%
NPF	0.50% + 1% = 1.50%	

The result of this formula provides the percentage by which expected producer revenues should be adjusted to stay in line with iCOP and CPI changes. In Canada, milk is sold according to a harmonized milk classification system that is based on what the milk components are used for. When prices are updated, the milk price adjustment formula is applied to the price of milk components (protein, butterfat and other solids) in classes 1 to 4 except for class 4(m) and solids non fat in class 4(a), the price of which depends on world prices.

The NPF results are then evaluated against the three Exceptional Circumstances criteria. These criteria are in place to ensure that there is no disconnect between the formula results and the marketplace. Exceptional Circumstances criteria are used to initiate a discussion process. They do not automatically result in a change to the agreed annual price adjustments.

Exceptional circumstances can be invoked when:

1. An unexpected event occurred that has not been accounted for in the latest COP data.*
2. The difference between the annual changes to the iCOP and the CPI is greater than 5 percentage points.
3. Expected producer returns, adjusted for NPF results, are 3.5% greater or lower than the iCOP.



*Cost of production data from the last complete calendar year are used in the National Pricing Formula. For example, the price adjustment for February 1, 2022 is calculated in the fall of 2021 using 2020 data. If a significant event affecting cost of production occurs in 2021, its effect will not be captured in the 2020 COP data. This criterion requires that the stakeholder electing to cite this criterion provide supporting evidence.

If one or more of these criteria apply, industry stakeholders* can request to invoke the Exceptional Circumstances process and to suspend the application of the results of the NPF.

If at least one stakeholder wants to suspend the results of the formula, the CDC Board consults with stakeholders and examines market information before deciding on a price adjustment. Furthermore, any stakeholder can request that the exceptional circumstances mechanism be invoked any time during the year if one of the three criteria above is met.

If Exceptional Circumstances are not invoked, the results of the NPF are applied and implemented for the next price change.

7 - Effective prices

Whether the new prices are decided by the application of the NPF or through a pricing consultation led by the CDC Board, the price adjustment is announced at the latest on November 1. Following this, the CDC calculates the price change for each milk class and submits the new prices to provincial authorities who then approve them based on their own process. Annual price revisions come into effect on February 1. This gives the industry and consumers a three-month notification period. Should a mid-year price occur, the CDC makes every attempt to provide a similar three-month notification period.

Although dairy producers sell milk, dairy processors purchase the components 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 price. The retail price of dairy products is not regulated in Canada. However, some provinces do regulate the retail price of fluid milk.

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*Stakeholders include Dairy Farmers of Canada, Dairy Processors Association of Canada, Retail Council of Canada, Restaurants Canada and the Canadian Federation of Independent Grocers.

8 - Annual Timeline for February 1 Price Adjustment

Timing	Task
COP recruitment	
October (Year 0)	• Data collectors verify current work lists (farms already in the survey) • Set up targets in each region and sub-region • Start COP recruitment process
End-October - early November)	• Initial recruitment letters go out • Data collectors begin contacting potential participants
Data collection	
January - December (Year 1)	• Costs of this period are used in the following year's COP process
COP data compilation, calculation, and indexation for pricing	
January - April (Year 2)	• Data collectors collect, verify and organize data
May	• The CDC receives initial COP data from data collectors
June	• The CDC reviews COP data and corresponds with data collection agencies to investigate any anomalies
July	• The CDC shares draft pricing schedule for the upcoming pricing cycle with stakeholders
August	• The CDC reviews COP and prepares preliminary results indexed to July
September	• The CDC Board reviews preliminary results • Preliminary results are shared with stakeholders
October	• COP indexation is finalized and reviewed by CDC Board • Release results of the pricing formula and exceptional circumstances to the industry • Pricing consultation with all stakeholders
November 1st	• Publication of price adjustment and CDC support price for butter
December	• Effective milk component prices pre-approved by the joint P5 Supervisory Body and WMP Coordination Committee and then approved by provincial authority
Implementation of new pricing	
February 1st (Year 3)	• Price change using NPF goes into effect