The Environmental and Socioeconomic
Life Cycle Assessment of Canadian Milk Production

Canadian dairy farmers are leading the way in sustainable dairy farming

The Canadian dairy sector operates in a fast evolving environment:

Consumers are more and more concerned about the sustainability of food products.

Citizens expect Canadian companies in the agri-food sector to be responsible corporate citizens.

Dairy businesses operating in supply chains need to work together to meet the challenge of sustainable growth.

The global **dairy industry** is continuously improving sustainable dairy production.

In an effort to meet these expectations and to clarify the path towards sustainable milk production in Canada, the Dairy Farmers of Canada commissioned a **Socioeconomic and Environmental Life Cycle Assessment (LCA) of Canadian Milk Production.**

What is LCA?

LCA is a world-renowned methodology used by various organizations in the agri-food sector – from individual companies to sectoral associations. In this project, environmental impacts and social performance were evaluated at every life cycle stage, from raw material extraction up to the processing plant gate, to offer a global and comprehensive profile of Canadian milk production.

Life Cycle Perspective

About the study

This LCA study is part of a research cluster that brings universities, government and the dairy sector together on research to drive innovation in the dairy industry.

The assessment involved the participation of 300 farmers and several stakeholders from different regions. The results thus account for geographical and regulatory differences across Canada.

An important milestone for the Canadian dairy industry

This diagnostic provides useful information for the Canadian dairy industry.

For dairy farmers

- Data to support comparison and benchmarking;
- Identification of potential areas of focus for further improvement.

For industry members

(feed manufacturers, processors, policymakers, retailers)

- Sound and representative quantitative data about the social and environmental performance of Canadian milk production to use in their own assessments and reports;
- Opportunities for collaboration to improve the industry's overall footprint;
- Information to differentiate their Canadian brands from imported products.

A study funded by:

Dairy Research for a Healthy World. | Dairy Farmers of Canada | Les Producteurs laitiers du Canada | Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada | Canadian Dairy Commission | Commission canadienne du lait

A study conducted in 2012 by:

Quantis | GROUPE AGÉCO | CIRAIG

An evaluation of dairy farmers' socioeconomic performance

Canadian dairy farming: An engine for jobs

The Canadian dairy sector is a stable and consistent contributor to the economy in every province; there is reinvestment and economic spin-offs throughout the agri-food value chain and the social fabric of Canada's rural communities.

Source: http://www.dairyfarmers.ca/what-we-do/our-economic-contribution

12,746 farms

$7.8 Billion to Canada's GDP

129,273 jobs

(Data from 2011)

The socioeconomic performance

The study considered 40 different indicators of socioeconomic performance, from working conditions to animal welfare and agri-environmental practices. The results indicate that the average Canadian dairy farm performs positively with its stakeholders, such as farm workers, local communities and society in general. For instance, among the producers consulted:

Beyond economic contributions
Canadian dairy farmers are corporate citizens whose individual and collective interactions with their stakeholders can contribute to the overall well-being of society.

60% provide working conditions that go beyond provincial labour standards. In regards to hourly wage, more than 95% of them offer a wage that is beyond those standards.

87% are actively engaged in their community – whether by being involved in local organizations, hosting trainees or opening up their farms to public tours.

78% have adopted sound agri-environmental practices – through their use of manure management methods, soil conservation techniques and water protection systems.

Provincial dairy organizations are also committed to their communities, as evidenced by milk donations to food banks, school milk programs, sponsorship programs, and contributions to research. Provincial dairy organizations are working collaboratively to implement improved animal care and sustainable development initiatives across the country.

Areas for improvement

The assessment also pointed to areas for improvement:

- Avoid long working hours for better worker health and life quality (i.e. > 48h per week as established by the International Labour Organization's standards).
- Adopt manure spreading technology (e.g. low spreading, conventional low boom, dribble bars, injection) and windbreaks to minimize odour during manure application.
- Participate in training activities and improve housing installations as recommended in the Code of Practice for the Care and Handling of Dairy Cattle to improve animals' well-being.
- Adopt alternatives to the use of chemical pest control (e.g. cultivation methods, mechanical control and biological control) to limit the potential environmental risks associated to those products.

The environmental impacts of milk production in Canada

From cradle to processors' gate

The environmental performance

This LCA provides an environmental profile of an average kilogram (.97 litre) of milk produced in Canada. The main results are:

Carbon footprint
Livestock management, manure management and feed production are the main contributors to the carbon footprint. More specifically, methane and nitrous oxide emissions are highest from enteric fermentation, manure storage and fertilizer use in feed crop production.

Water footprint
The water footprint of milk production in Canada varies widely by region. In some regions, irrigation is required for feed production; in such cases, it represents the largest contributor to the water footprint. For all other farms, the main contribution to the water footprint comes from water evaporation during upstream production of the energy that is used on the farm, and also from direct on-farm use (drinking and cleaning water).

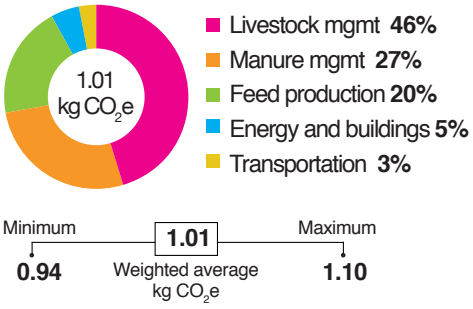
Land Use
Land use is a measure of the amount of land required for feed production.

The environmental profile of a kilogram (.97 litre) of milk

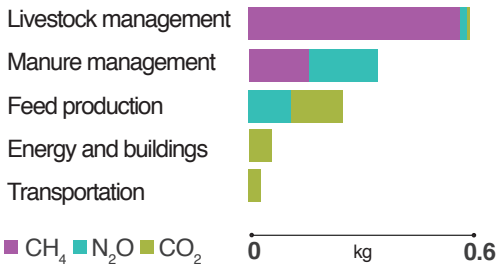
In the following figures, the average, minimum and maximum values are presented to show regional differences across the country.

Carbon footprint

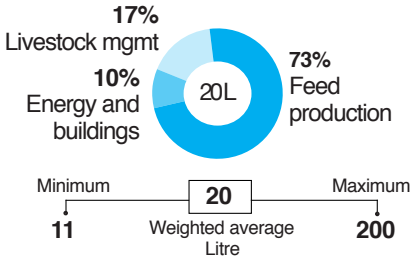
Contribution of each life cycle stage



Breakdown of GHG emissions

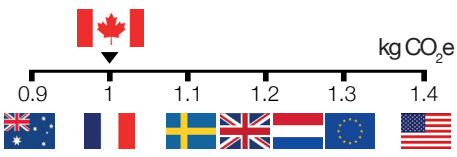


Water consumption



Average land use

A carbon footprint among the best in the world
By referring to comparable studies in other countries, it can be shown that the GHG emissions generated per unit of milk produced in Canada are among the lowest globally.



Areas for improvement

As part of efforts to continuously improve the sustainability of dairy farming, the study identified best practices that farmers can use to improve their environmental performance such as:

- Improved tracking of fertilizer use for crop production.
- Improved manure storage and spreading techniques to lower the carbon footprint.
- Improved feed efficiency with better cattle diets, to reduce methane emissions from enteric fermentation.

The future of sustainable milk production in Canada

Looking ahead

The LCA contributes to an ongoing commitment towards sustainable dairy farming in Canada. Specifically, the LCA framework will be used for:

Measurement and improvement

The LCA supports farmers and their organizations in understanding the source of impacts, identifying areas for improvement, and implementing best practices. The model provides a baseline of environmental and socioeconomic performance to measure improvement over time.

Knowledge transfer and capacity building

The LCA provides a wealth of knowledge on best management practices (BMP), which are part of environmentally and socially responsible business management. These BMPs foster the sustainability culture within the sector.

Communication and collaboration

This study is an example of Dairy Farmers of Canada's commitment to share and communicate in a transparent way with industry members in order to foster collaboration and synergy. The objective is to improve the overall social and environmental performance of the Canadian dairy industry.

Next steps

Drawing on these results, Dairy Farmers of Canada has already taken several concrete steps to lead the way in sustainable dairy farming, including the development of an online interactive self-assessment tool within the Dairy Research Cluster (in progress) and the implementation of the proAction Initiative for customer assurance.

Online interactive self-assessment tool

Project objectives:

- Help dairy farmers assess and understand the environmental and socioeconomic impacts of their own farm;
- Inform and encourage dairy farmers to adopt more BMPs;
- Provide data to Dairy Farmers of Canada and provincial dairy organizations that will support sustainability reporting and define action plans.

A certification program

A customer assurance program to validate the actions of dairy farmers in six areas of sustainable milk production:

- Environment
- Milk quality
- Food safety
- Traceability
- Biosecurity
- Animal welfare

For more information:

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Access to the executive summary