



SUSTAINABLE MILK PRODUCTION

Research Highlights
2017 – 2018



Dairy Farmers of Canada, in partnership with Agriculture and Agri-Food Canada, and provincial partners, is supporting six research projects in sustainable milk production through the Dairy Research Cluster 2.



Key Outcomes:

- Models to balance dairy rations for proteins and amino acids (AA) were improved; providing a breakthrough to update the feeding systems currently used. The findings will be used in the next revised version of the NRC Nutrient Requirement of Dairy Cattle- a guide used by dairy nutritionists in North America. When implemented in dairy rations, estimates are that Canada can cut its nitrogen emissions by 17,000 tonnes a year and Canadian farms will save \$77.5 million annually.
- New data generated showed that cows in Canada emit less enteric methane than reported. The result produced a new factor of 5.79%, which is lower than the default value of 6.5% used by the Intergovernmental Panel on Climate Change (IPCC) for the calculation of inventories of enteric methane emissions from dairy cows. The new factor of 5.79% will be included in the IPCC's methodology that will be released in 2019.
- The concentrations in milk of six specific fatty acids were correlated with methane emissions suggesting that it may be possible to predict a cow's methane emissions based on the fatty acid profile of her milk.
- Key findings from field experiments showed that growing alfalfa in a mixture with grasses, instead of pure stands, may increase annual milk production per hectare by 8% in major milk production regions in Canada.
- New genetic materials with high concentration of energy have been selected and will be used to develop new high energy alfalfa cultivars.
- On a whole-farm basis, over 99% of all water loss from rain-fed dairy farming is from crops and pastures, with the remaining from cattle intake. Nutrient leaching loss was reduced by applying manure in spring, avoiding fall manure application, and minimizing the use of mineral fertilizer.
- Drinking water consumption is highly correlated with maximum air temperature therefore minimizing heat stress on cows can reduce the water footprint of milk production by reducing water demand and increasing milk yield.



Ongoing Projects:

1. Agri-environmental assessment of Canadian dairy farms: Towards eco-efficient management of forage crops and manure – PIs: Martin Chantigny, AAFC-Quebec and Doris Pellerin, Université Laval
2. Mitigation of enteric methane production from dairy cows and impact on manure emissions: Filling knowledge gaps – PIs: Chaouki Benchaar, AAFC-Sherbrooke and Rachel Gervais, Université Laval
3. Balancing dairy rations for protein: filling the gaps and updating formulation models to reduce protein intake sensibly – PIs: Hélène Lapierre, AAFC-Sherbrooke and John Cant, University of Guelph
4. Water footprint assessment and optimization for Canadian dairy farms – PIs: Andrew VanderZaag, AAFC-Ottawa and Robert Gordon, University of Guelph /Wilfrid Laurier
5. Development of an online interactive self-assessment and improvement tool (footprinter) to assess and compare production/management systems – PI: Edouard Clément, Groupe AGECO
6. Increasing the energy of Canadian forages fed to high producing dairy cows – PI: Annie Claessens, AAFC-Quebec

RESEARCH SUCCESS STORIES

A dynamic online tool called Dairy Farms + linked with the Canadian DHI database enables Canadian dairy farmers to voluntarily measure and track their farm's environmental footprint, act and apply Best Management Practices to reduce the farm's environmental footprint, meet sustainability goals and evaluate continuous improvement over time.

Dairy Farms +
www.dairyfarmsplus.ca

A new web-based decision support tool on the Agrométéo Québec platform was developed and is being tested to help forage producers make informed decisions on the optimal time of cutting timothy forage given its digestibility and yield under climatic conditions.

Agrométéo Québec
www.agrometeo.org

"As Canadian dairy farmers, we are proud that our carbon footprint continues to decrease, with a reduction of 28% on a per litre of milk basis between 1990 and 2015."

***Ron Maynard, Board member,
Dairy Farmers of Canada***

For information: info@dairyresearch.ca

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