

**PROJECT 2013-2018**

BALANCING DAIRY RATIONS FOR PROTEIN: FILLING THE GAPS AND UPDATING FORMULATION MODELS TO REDUCE PROTEIN INTAKE SENSIBLY

Principal Investigators:

HÉLÈNE LAPIERRE

Agriculture and Agri-Food Canada (AAFC), Sherbrooke

JOHN CANT

University of Guelph

COLLABORATORS:

Daniel Ouellet
AAFC - Sherbrooke

Mark Hanigan
Virginia Tech, VA, USA

James France
University of Guelph

Doris Pellerin
Université Laval

Michael E. van Amburgh
Cornell University, NY, USA

**Number of students trained
(MSc, PhD, Post-Doc):**

9

TOTAL BUDGET

\$1,080,709

INVESTMENT PARTNERS

Agriculture and
Agri-Food Canada

**OBJECTIVE:**

When formulating diets for lactating dairy cows, most nutritionists in North America use one of two mathematical models to calculate protein requirements—either the National Research Council (NRC) Dairy model or the Cornell Net Carbohydrate Protein System (CNCPS). The protein requirements calculated by each of these models are based on many old assumptions to estimate the amounts of proteins on both the supply side and the output side and their amino acid (AA) composition. The objective of this project was to update and provide more accurate estimates of these amounts and respective AA concentrations in order to improve the match between supply and requirement and thus increase the overall efficiency of protein utilization by the lactating cow and reduce feeding costs and nitrogen excretion into the environment.

KEY OUTCOMES:

- This activity improved the models to balance dairy rations for proteins and amino acids thus providing a breakthrough to improve the feeding systems currently used to balance dairy rations for proteins and AA.
- The amino acids composition 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.
- Global calculations showed that reducing the protein in dairy rations from the current average at the initiation of the project of 18.1% to the doable 16.5% would reduce annual N excretion by 17 000 tons and save 1.01\$/hl of milk, for an approximately yearly economy of 77.5 M\$ in Canada.

LINK TO KTT TOOLS**VIDEO:**

Dairy cows: From the dairy ration to the mammary gland
youtu.be/sV5hy0AT50M