Dairy Alliance

Duration: 2022-2027

Highlights

- Dairy processors and retailers are interested in improving finished product quality such as cheese color and texture.

- Managing animal feed, bedding and housing are vital components to improving animal health and welfare as well as finished product quality.

- Theme 1 will develop biotherapeutics for delivery in feed as innovative products to manage feed efficiency and reduce methane emissions.

- Theme 2 will develop more effective inoculants for silage to reduce contamination and spoilage as well as biotreatments for the farm environment to modulate the microbiota of bedding materials.

- Theme 3 aims to develop innovative process control measures and technologies in the form of molecular-based sampling tools to reduce dairy product spoilage and waste, which will support the profitability of the dairy industry.

- Theme 4 will develop strategies to control foodborne pathogens and antimicrobial resistance (AMR) gene persistence in the gut microbial community which will be tested both in a laboratory setting and in animals.

Objectives

General objective: to ensure the quality of dairy products through better knowledge and control of microbial ecosystems during production and processing.

1) Reduction in pathogen transmission and improving feed efficiency can be achieved through biocontrol agents for use in silage and bedding

2) Developing tools for monitoring process control will help to reduce spoilage and defects in milk and cheese

3) The spread of antimicrobial resistance genes through the gastrointestinal microbiota can be curtailed by reducing AMR plasmid stability

Results and potential benefits

- **Economic:**
  - Canadian dairy producers will see increased net profits through reducing losses in feed and milk production due to spoiled silage
  - Improving silage stability will keep dairy production costs lower by reducing losses due to contamination and spoilage
  - Reducing waste related to spoilage and downgrading of dairy products will improve the competitiveness of the processing sector.

- **Environmental:**
  - Reduction in GHG for more sustainable dairy production

- **Social:**
  - Improved animal health & welfare
  - Improved safety and functionality of dairy products for consumer health
  - Help alleviate antimicrobial resistance issues by accelerating the loss of antimicrobial resistance genes

Innovative aspects

- This project builds upon a multidisciplinary approach that leverages the latest molecular science and technologies to address the research priorities established by the dairy sector.
- State-of-the-art *in vitro* models of the cow hind gut and of human microbiota will be used to develop new technologies for reducing the prevalence of AMR genes and bacteria in agriculture.

Professional trained

Recrutement of graduate students is in progress.

For further information

Results will be shared through written communication (theses and articles), as well as through oral presentations and posters at national and international conferences.

Knowledge transfer activities are planned with the participation of *Dairy at Guelph*, the Dairy Farmers of Ontario, Dairy Farmers of Canada and Novalait Inc. (Forum techno).

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- Novalait
- Dairy Farmers of Canada
- Dairy Farmers of Ontario
- Lactalis Canada
- Lallemand Inc.

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