



PROJECT 2016-2018

MILK AND DAIRY PRODUCTS, OUTSTANDING SOURCES OF VITAMIN B₁₂: A FARM TO FORK APPROACH

Principal Investigator:

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

2

TOTAL BUDGET

\$495,927

INVESTMENT PARTNERS



Agriculture and Agri-Food Canada



OBJECTIVE:

Dairy products are considered to be important sources of vitamin B₁₂ in the human diet. However, the concentration and absorption (bioavailability) of B₁₂ in various dairy products is unclear.

This study examined B₁₂ content and bioavailability in a number of dairy products, compared the availability of B₁₂ in dairy products with that of a vitamin supplement and examined the possibility of estimating milk B₁₂ concentrations from the infrared spectra produced in the routine analysis of milk.

KEY OUTCOMES:

- Using a simulated digestion system, the stability of vitamin B₁₂ in a gastrointestinal environment was demonstrated.
- Different dairy products showed different vitamin release profiles during simulated digestion, which could influence their absorption.
- Cheddar cheese had the best bioavailability of vitamin B₁₂ among the tested dairy products or compared to synthetic B₁₂.
- Using the pig as an experimental model of human digestion, it was demonstrated that B₁₂ present in cheddar cheese is ~ 2 times more available than the same amount of B₁₂ provided by a synthetic vitamin supplement.
- A new method was developed to reliably estimate the content of vitamin B₁₂ in milk.

BENEFITS TO THE DAIRY INDUSTRY

- Confirmed that dairy products are good and reliable sources of vitamin B₁₂ in the diet of Canadians.
- Demonstrated that vitamin B₁₂ from cheddar cheese is ~ 2 times more available than a vitamin supplement.
- Developed a new rapid, low-cost method that can be used to reliably estimate the content of vitamin B₁₂ in milk.

SCIENTIFIC PUBLICATIONS

Bioavailability of vitamin B₁₂ from dairy products using a pig model. 2018.
ncbi.nlm.nih.gov/pubmed/30134590

Impact of diet management and composition on vitamin B₁₂ concentration in milk of Holstein cows. 2019.
ncbi.nlm.nih.gov/pubmed/30774051