Lactanet
RÉSEAU CANADIEN POUR L'EXCELLENCE LAITIÈRE
CANADIAN NETWORK FOR DAIRY EXCELLENCE

MÉTHANE
– QUÉBEC –

Variation of enteric methane intensity predicted from bulk tank in commercial dairy herds

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Background

- We have recently developed a FTIR-based **prediction model** to monitor herd-level enteric methane emission intensity (CH_4 per unit of FPCM) from **bulk tank** milk samples

- Since April 2026, all Quebec herds can consult their enteric CH_4 emission daily (awareness)



Objectives

1. Provide a better understanding of herd level factors & management practices affecting predicted enteric CH_4 output

2. Provide understanding and interpretation guidelines for farmers and advisors

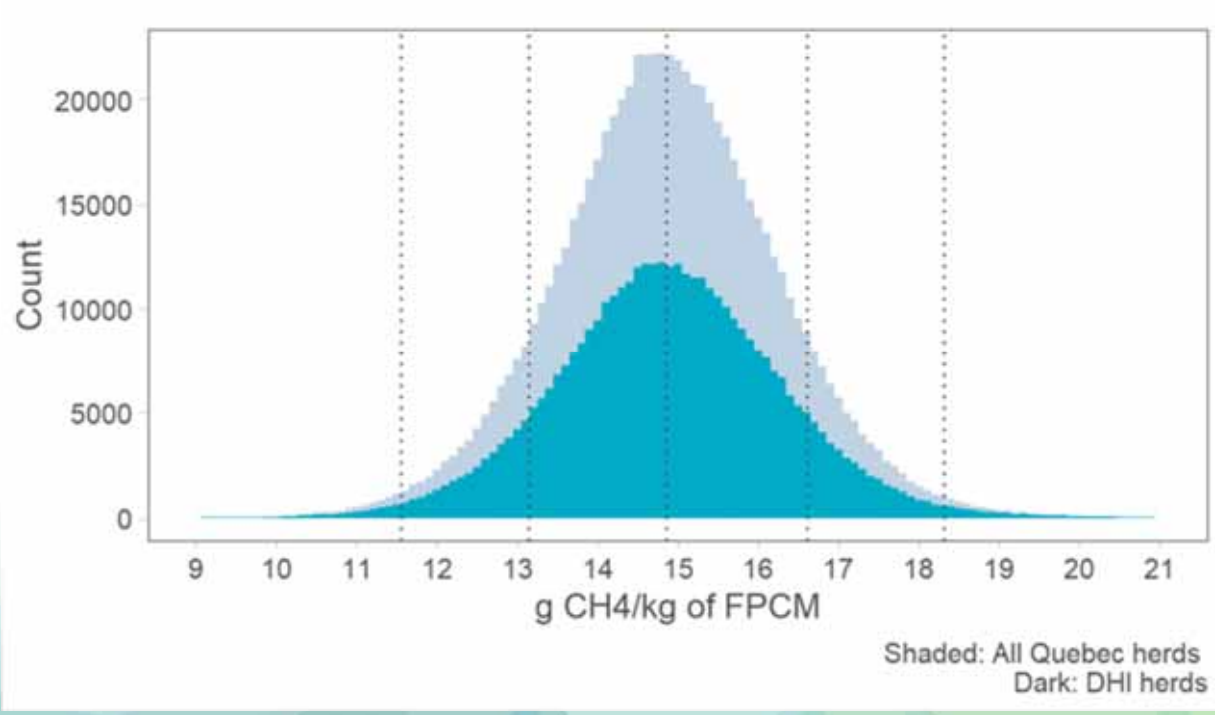
Material & Methods

- Bulk tank enteric CH4 predictions (g CH4/kg of FPCM)
- 4033 dairy farms in Québec, Canada, of which, 2291 herds on DHI
  - Herd management & housing information
  - Herd performance data
  - Ration information (401 herds)
- 12 months of data, every truck pickup (Jan-Dec 2025)
- Descriptive stats for now, deeper analysis to come

Results

Enteric CH_4 predictions in line with literature values

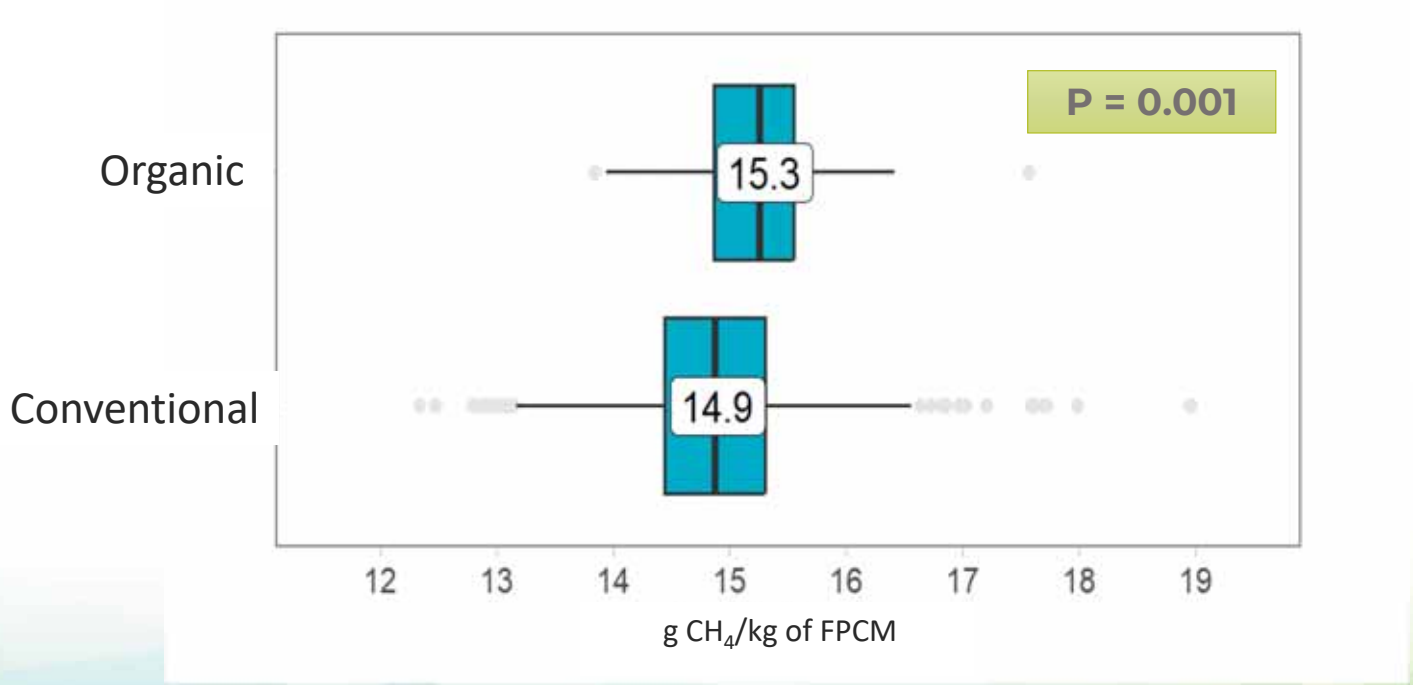
- Average: **14.9 g** (SD = 1.39 g)
- Range: 11.8–18.2 g (1^{st}–99^{th})



Units = g CH_4/kg of FPCM

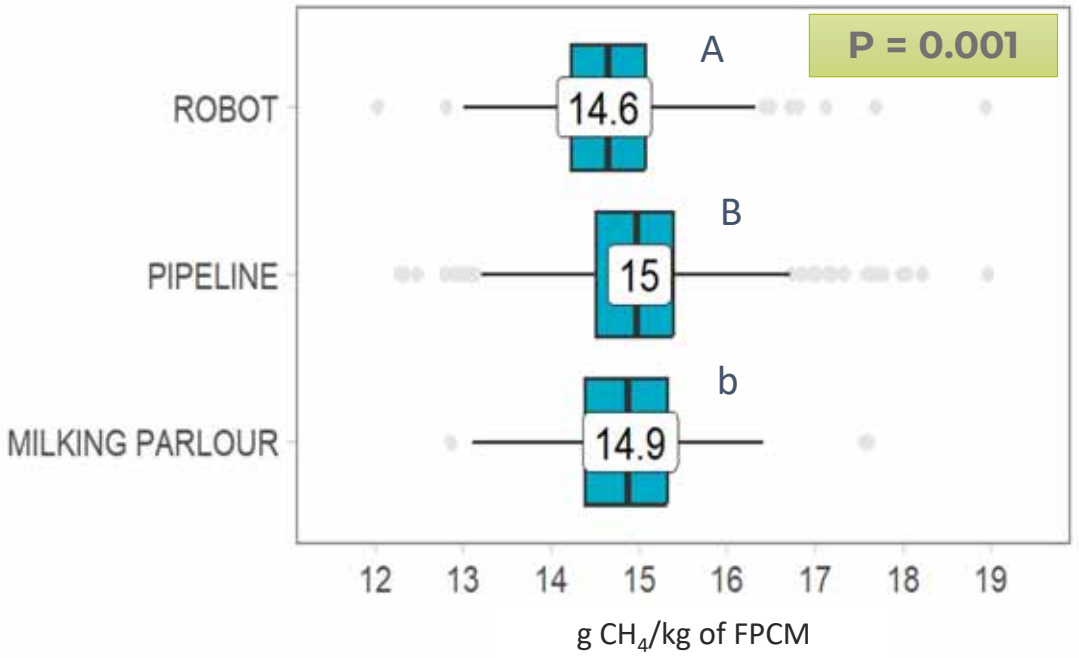
Results – Management Type

Lower enteric CH_4 for conventional herds



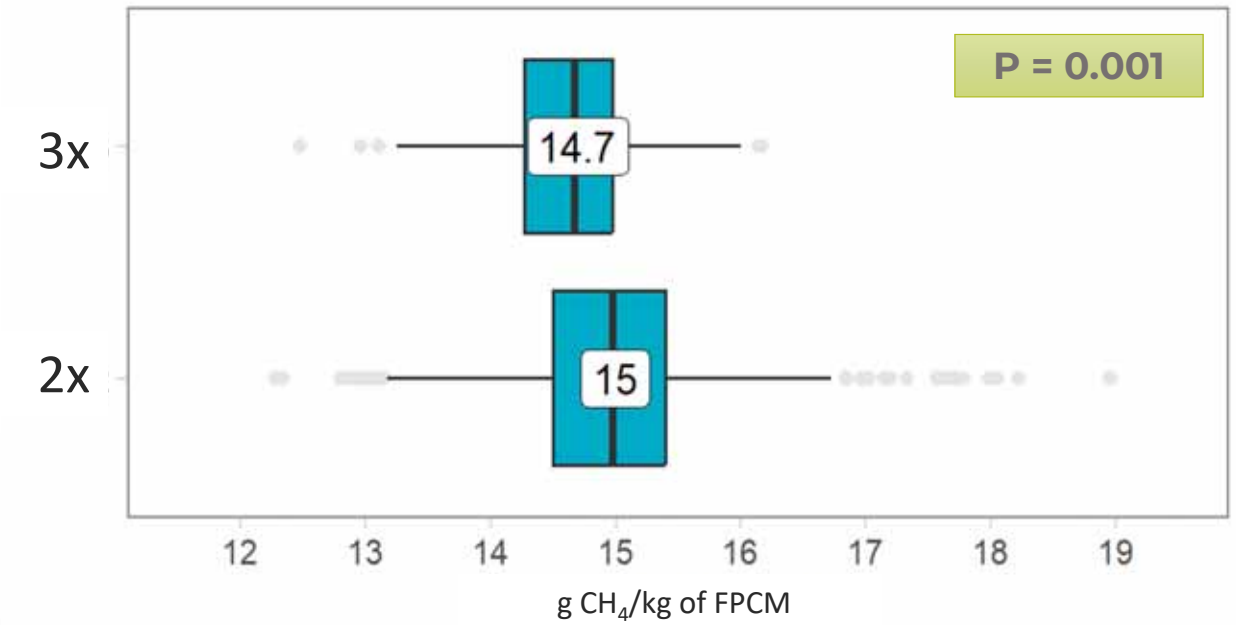
Results – Milking system & Housing

Lower enteric CH_4 for AMS herds



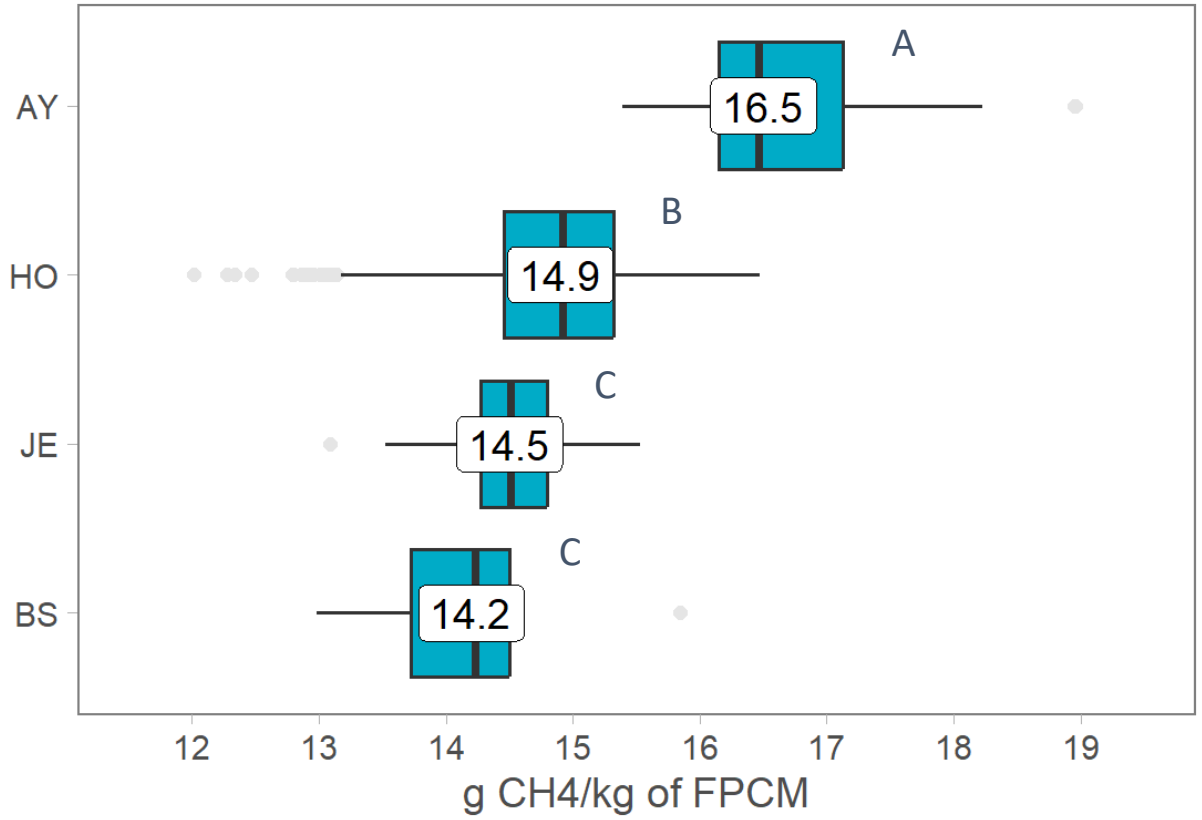
Results – Milking Frequency

Lower enteric CH_4 for herds milking more frequently



Results – Breed

Higher enteric CH_4 for AY cows, lowest for BS and JE



P = 0.001

Results – Herd performance

2291 herds on DHI

Herd test averages for 2025

HIGH = top 10% → highest emitters: > 16.6 g CH_4/kg FPCM

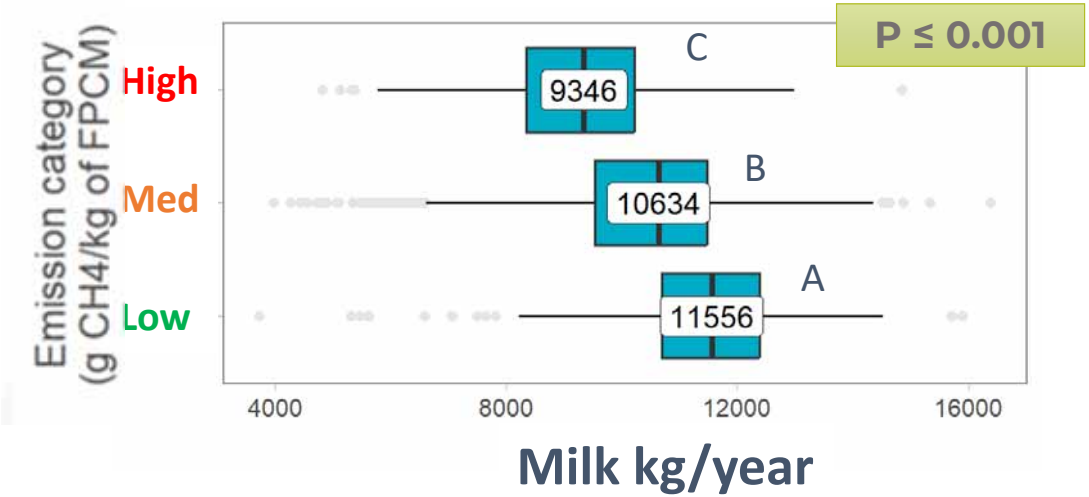
MED = 10-90% → 13.1-16.6 g CH_4/kg FPCM

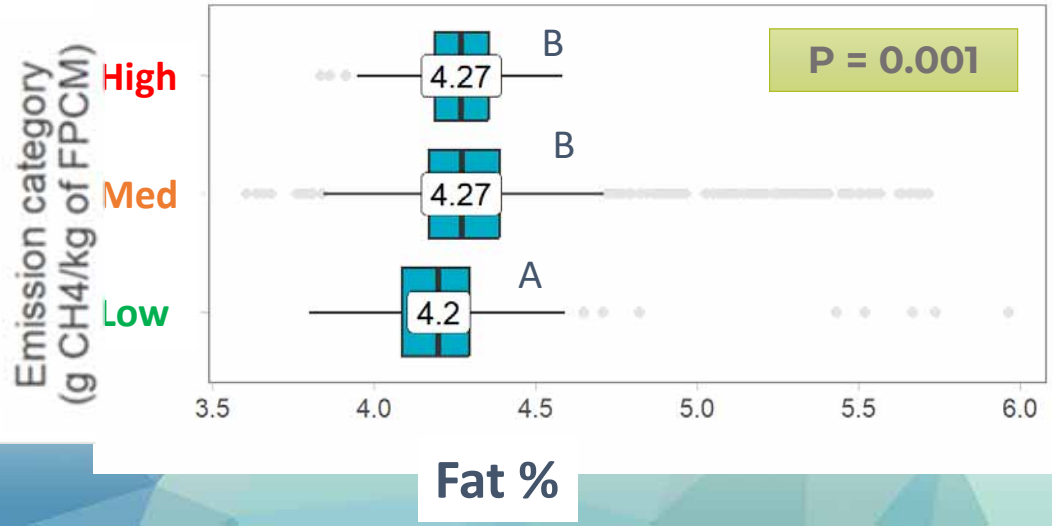
LOW = bottom 10% → lowest emitters: ≤ 13.1 g CH_4/kg FPCM

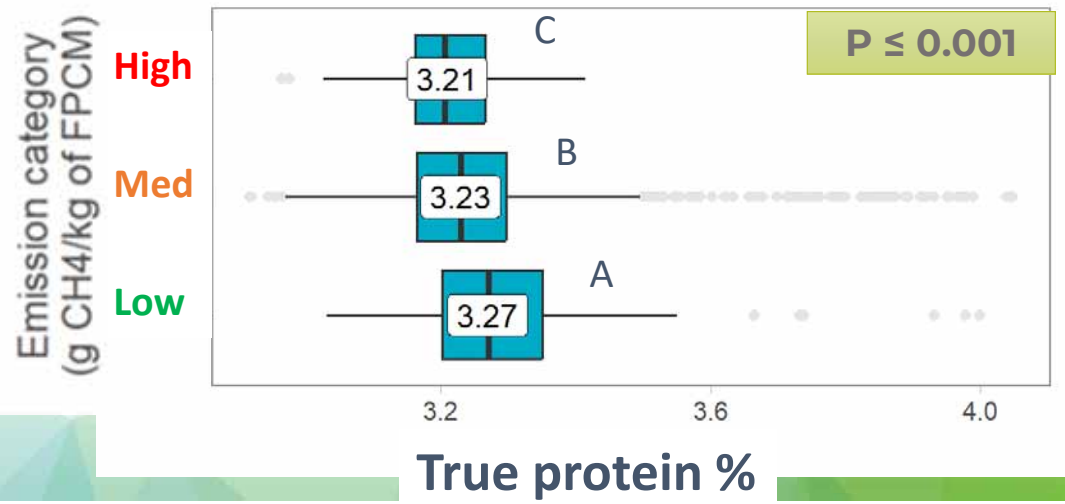
Results – Milk & Composition

Lower enteric CH_4 emission

- ↑ Milk yield kg
- ↓ Fat %
- ↑ True protein %



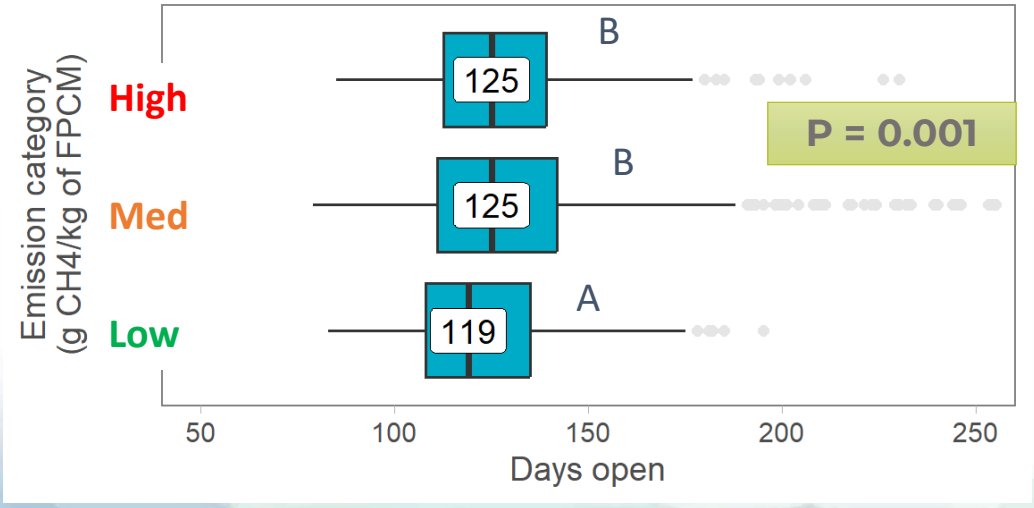


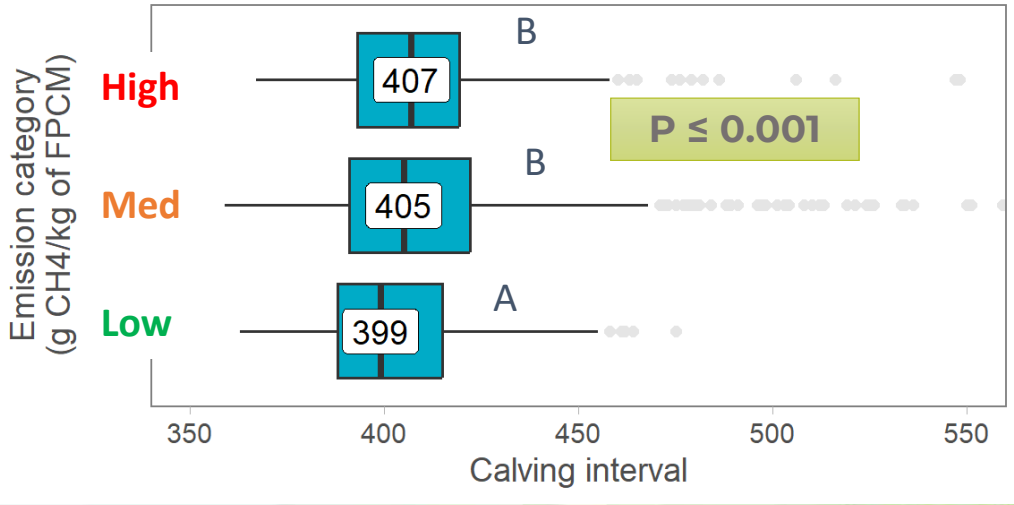


Results – Reproduction

Lower enteric methane emission is associated with

- ↓ Days open
- ↓ Calving interval

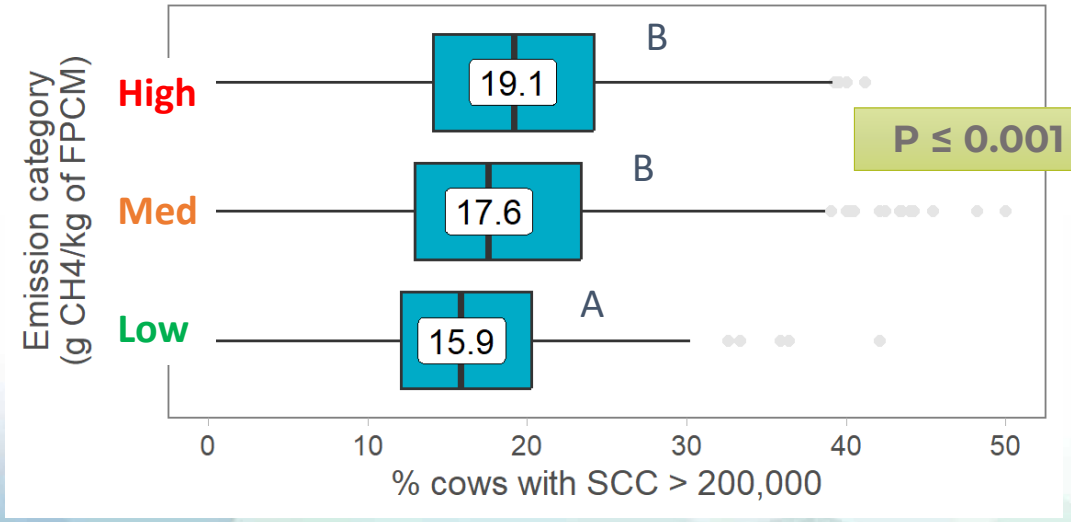


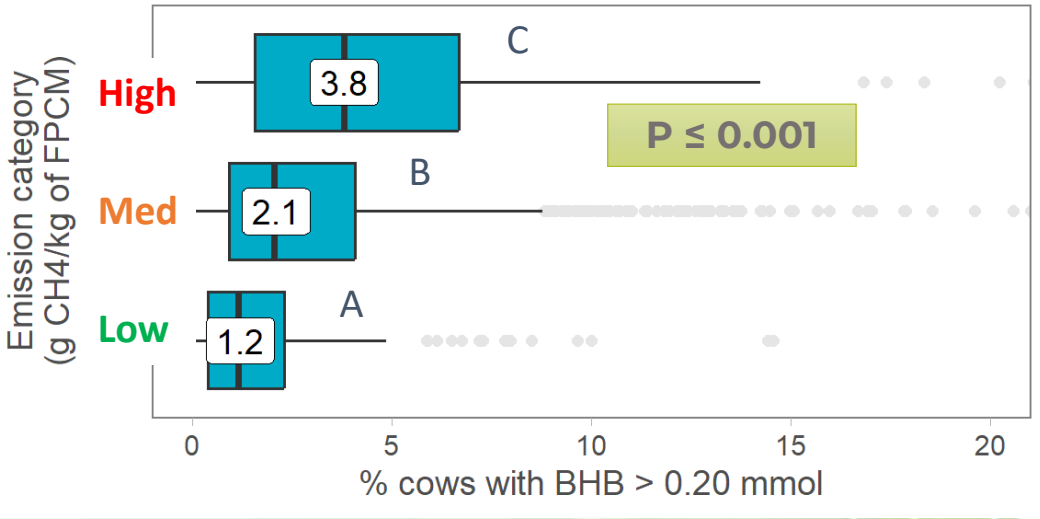


Results – Herd Health

Lower enteric methane emission is associated with

- ↓ Prevalence of cows with high SCC
- ↓ Prevalence of cows with high BHB

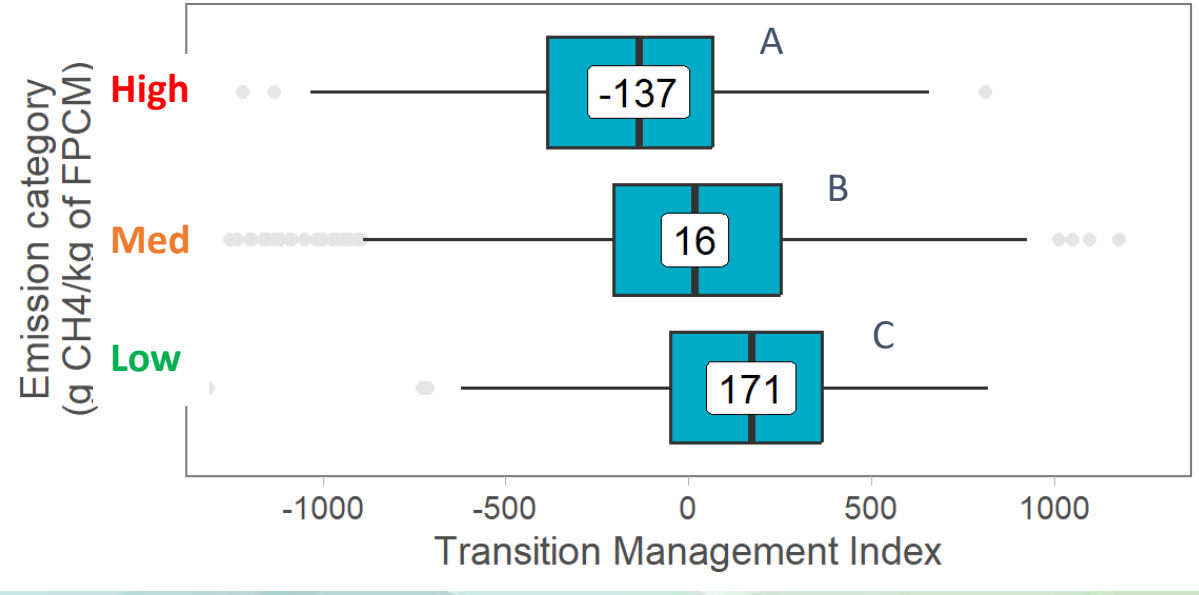




Results – Transition Period Success

Lower enteric methane emission is associated with

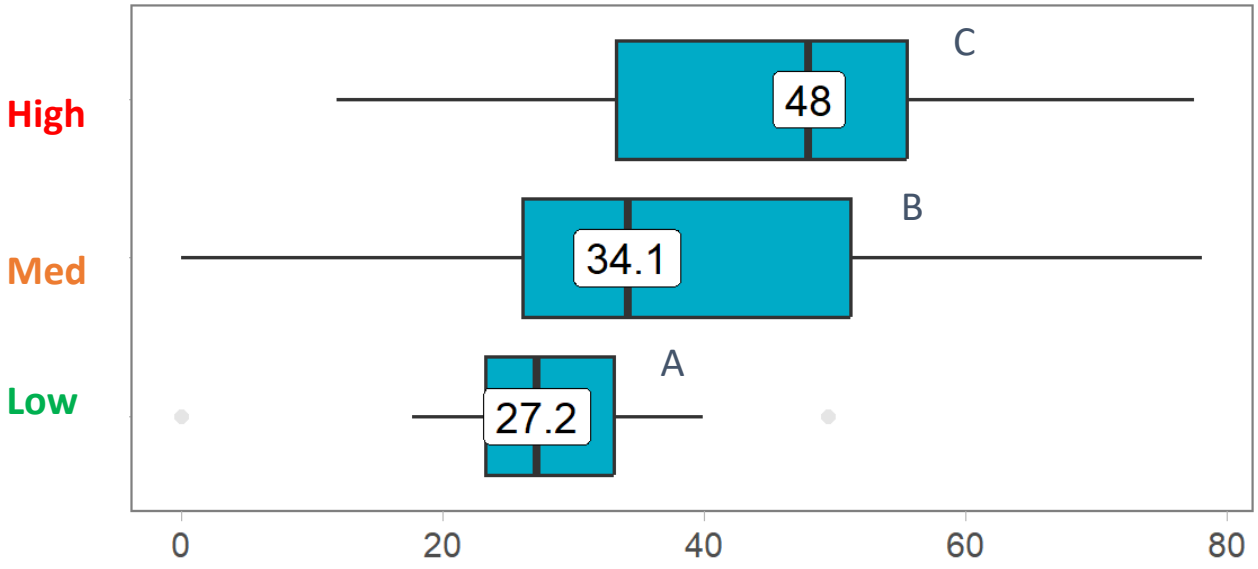
- ↑ Transition management index



P ≤ 0.001

Results – Feeding Management

Low emitting herds feed less grass silage

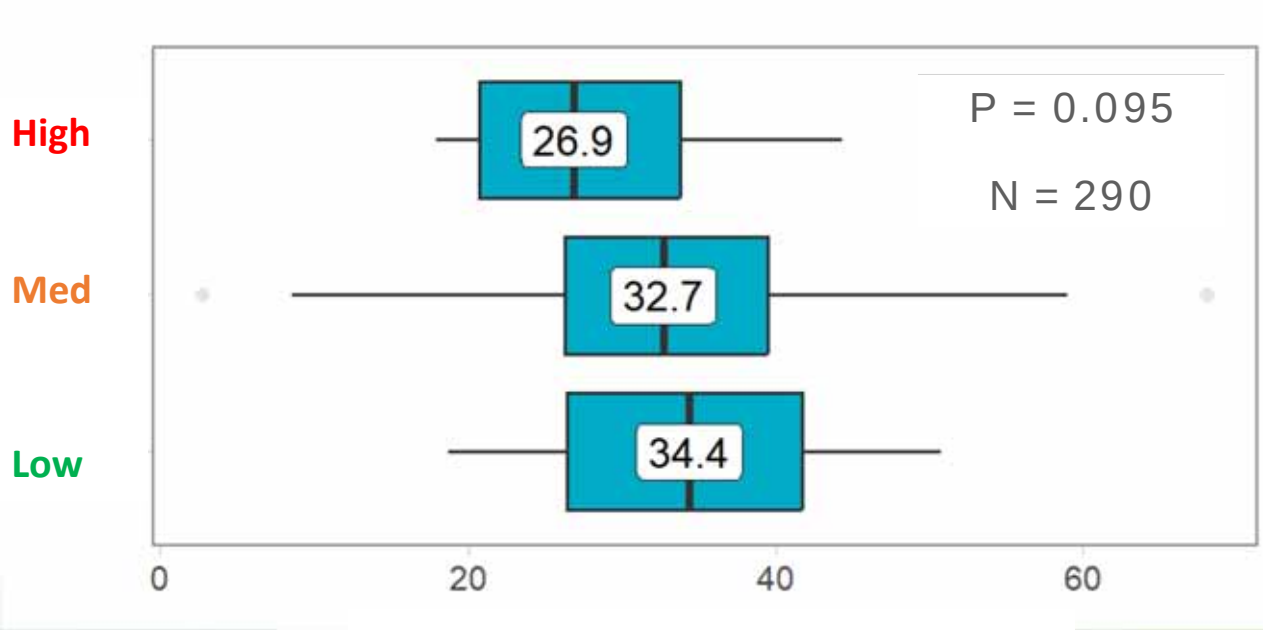


P = 0.001

N = 391

Results – Feed management

Proportion of corn silage has little effect



Report currently available to dairy farmers

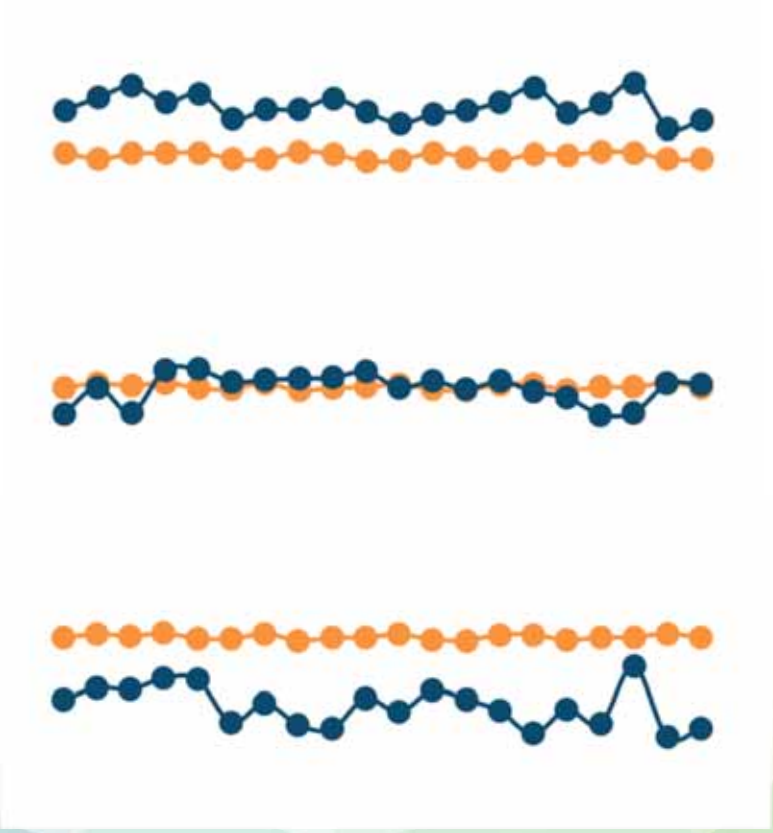
Objective: Raise awareness

Data interpretation

Above average emissions

Average emissions

Below average emissions



Herd

Provincial average

UNITS:

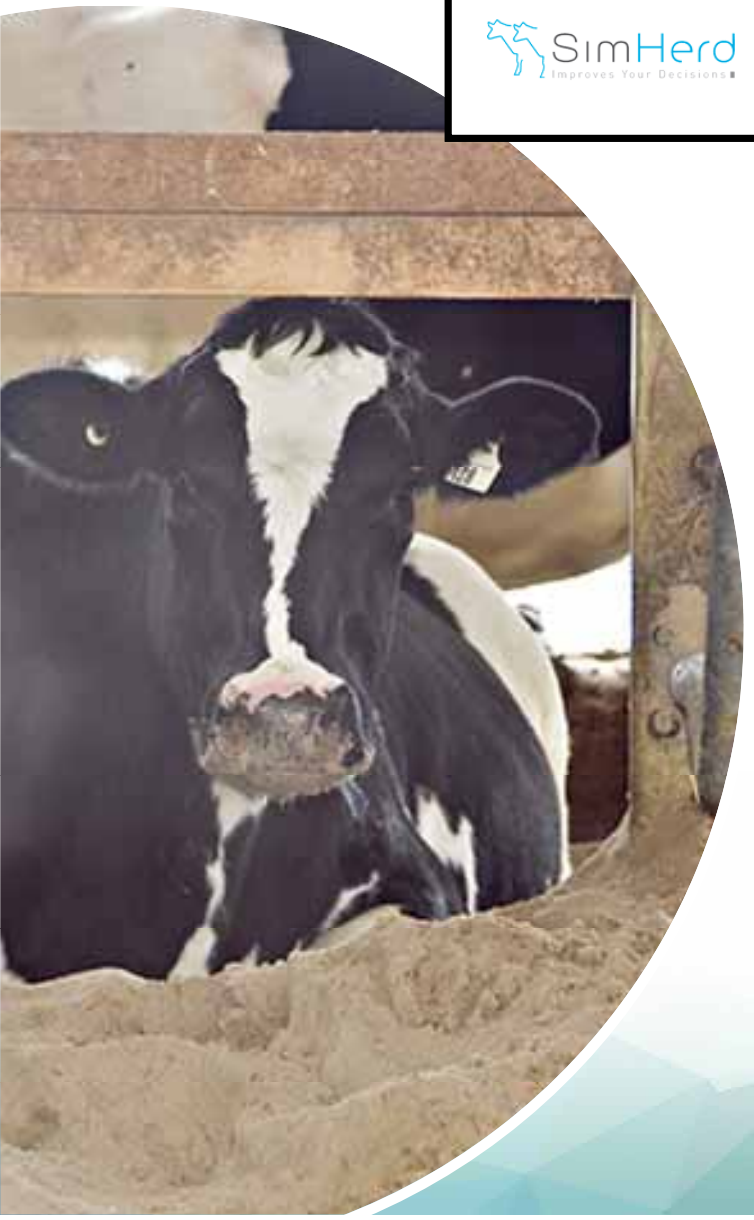
$\frac{\text{g CH4}}{\text{Kg FPCM}}$

Data interpretation guidelines

- Compare to provincial average
- Look at trends
- Understand impacts of feeding or management changes

Data interpretation guidelines

- ❌ Try to interpret variation from one day to the next
- ❌ Over-interpret data
- ❌ Use for carbon credit calculations



Economics of on-farm strategies

Feed efficiency

+0,05

16 000$

-5,5%

Reducing heifer inventory

-10% heifers

5000$

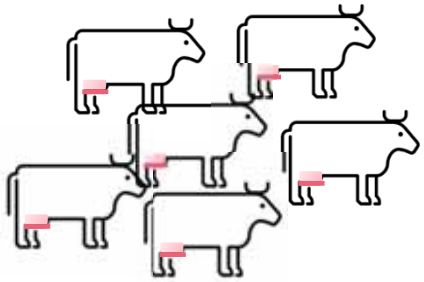
-3%

Operationnal margin ($)

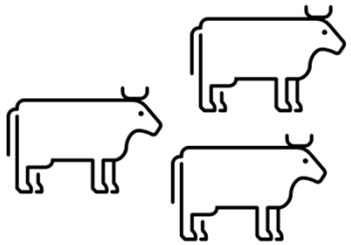
Methane (%)

In progress...

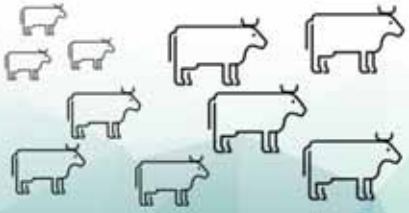
Lactating cows



Dry cows



Calves and heifers



Bulk tank

Herd inventory

CH4 Herd level

Take Home Message

CH_4 predictions from bulk tank milk samples via FTIR are in line with literature findings and can be used to **increase awareness**, **monitor** and **classify** herds in a cheap, non-invasive, no paperwork way

Acknowledgements

Les Producteurs de lait du Québec

14 participating farmers

Plan pour une économie verte

Québec

This project is carried out with the financial support of the Government of Quebec as part of the 2030 Plan for a Green Economy.
https://www.quebec.ca/gouvernement/politiques-orientations/plan-economie-verte

Thank You