DairyPrint model: Paving pathways for dairy farmers towards higher sustainability

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INTRODUCTION
- Quantifying greenhouse gas (GHG) emissions (i.e., CH₄, N₂O, and CO₂) from all significant sources in dairy farms is difficult and prohibitively expensive.
- The same applies to nutrient balance and management.
- Therefore, farmers must rely on mathematical models to achieve this.
- However, available models are cumbersome and overwhelming to use.

OBJECTIVE
To develop a simple, minimalistic, user-friendly, and scientifically sound whole-farm decision support model to assess environmental tradeoffs of dairy farming.

MATERIALS AND METHODS
- The DairyPrint model is composed of herd, barn, manure, crops and purchased feeds, and economic modules (Figure 1).
- Equations to predict animal outcomes (DMI, Milk Yield, Manure Excretion, etc.) and GHG emissions (herd and other modules) from well known references as NRC (2001), IFSM (2015), IPCC (2006), and others.

RESULTS – Inputs: Herd and Manure

RESULTS – Outputs: Herd

RESULTS – Outputs: Manure

RESULTS – Outputs: Dashboard: carbon footprint, nutrient balances, and economics

CONCLUSIONS
- The DairyPrint model is capable of helping farmers move toward higher sustainability, providing a user-friendly and intuitive graphical user interface allowing the user to respond to "what if" questions.

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