

INTRODUCTION

- \circ 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). as NRC (2001), IFSM (2015), IPCC (2006), and others.

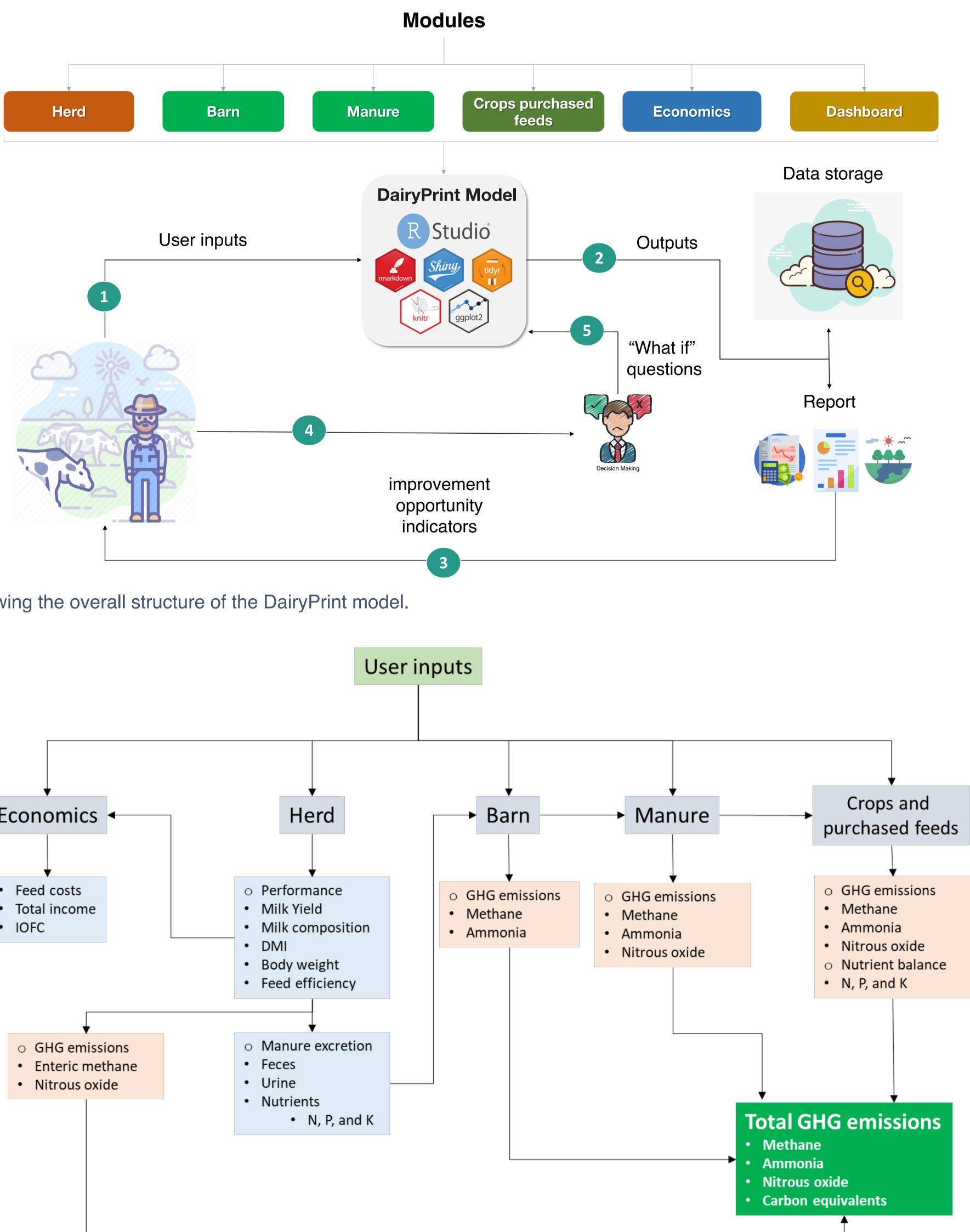
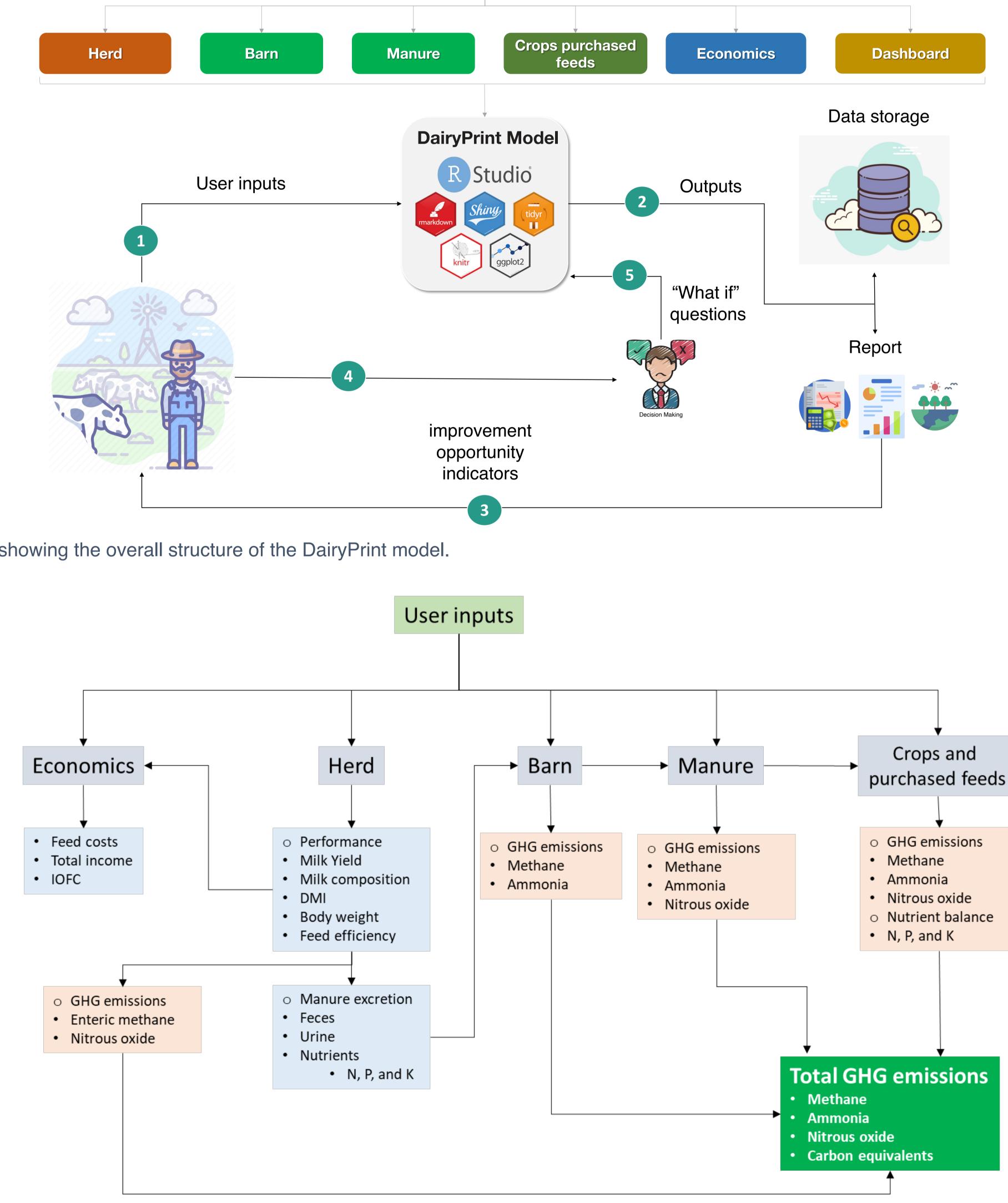


Figure 1. Diagram showing the overall structure of the DairyPrint model.

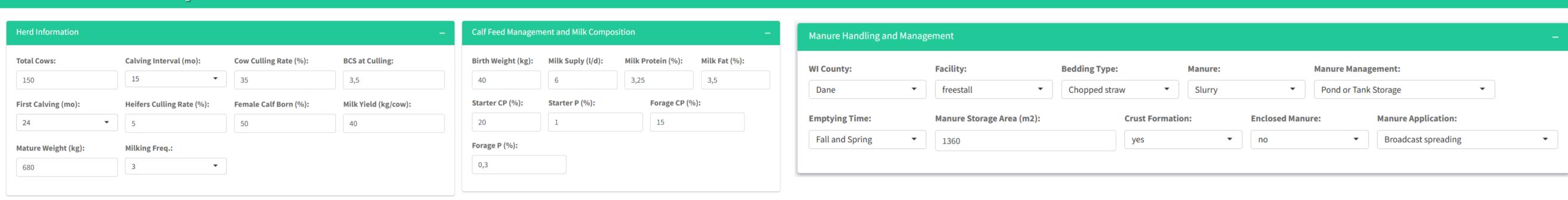


DairyPrint model: Paving pathways for dairy farmers towards higher sustainability Tadeu E. Da Silva¹ and Victor E. Cabrera¹

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• Equations to predict animal outcomes (DMI, Milk Yield, Manure Excretion, etc.) and GHG emissions (herd and other modules) from well known references

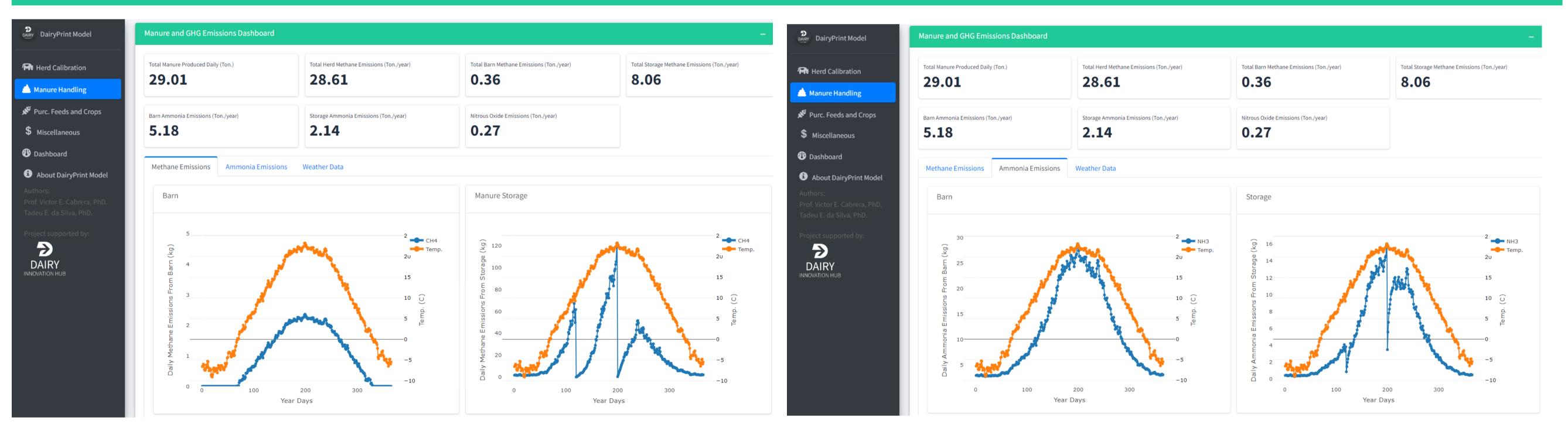
RESULTS – Inputs: Herd and Manure



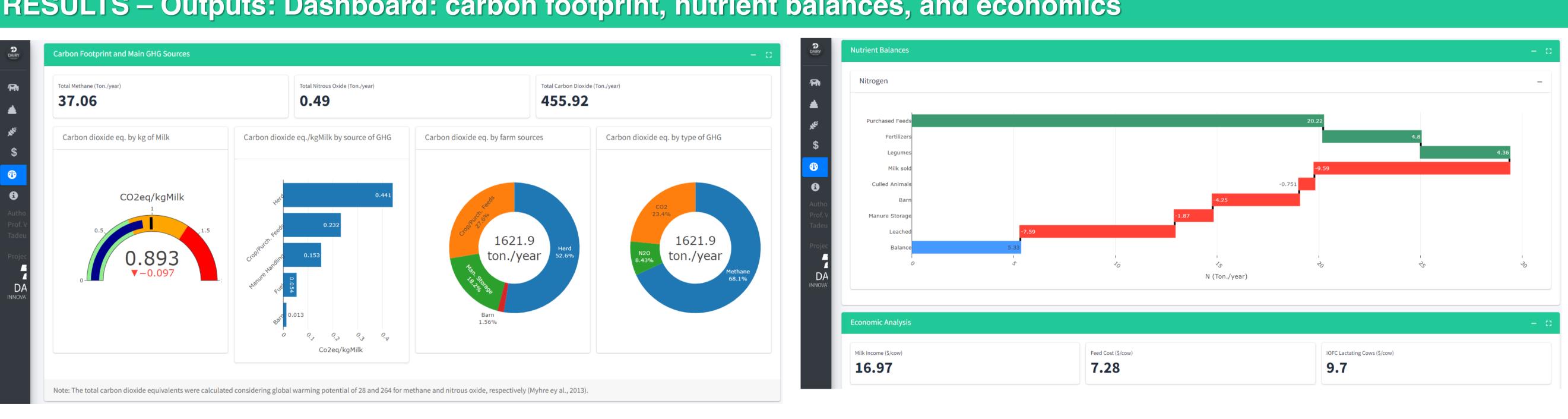
RESULTS – Outputs: Herd

DairyPrint Model	Herd Dashboard		- 🦛
Herd Calibration			
Manure Handling	Herd Inventory Performance Metrics Mar	nure Excretion and GHG Emissions Nutrient Excretion	
Purc. Feeds and Crops	Heifer DMI (kg/d)	Dry Cows DMI (kg/d)	Milking Cows DMI (kg/d)
Miscellaneous	7.25	12.41	24.26
Dashboard			
About DairyPrint Model	Heifer Water Intake (l/d)	Dry Cows Water Intake (I/d)	Milking Cows Water Intake (I/d)
ors: Victor E. Cabrera, PhD.	29.35	51.64	80.79
eu E. da Silva, PhD.	Milk Yield (kg/d)	Milk Yield Corrected for 4% Fat and 3.3% Protein (kg/d)	Feed Efficiency
ect supported by:	39.9	37.1	1.53
DAIRY	Milk Yield	Dry Matter Intake	

RESULTS – Outputs: Manure



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



CONCLUSIONS

o 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.

ACKNOWLEDGMENTS

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LAND & WATER



