Efficient farming & Carbon footprint

Tasmanian Dairy Conference

Tony Fransen

18 March 2021

There's always room for improvement

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Who am I?

There's always room for improvement

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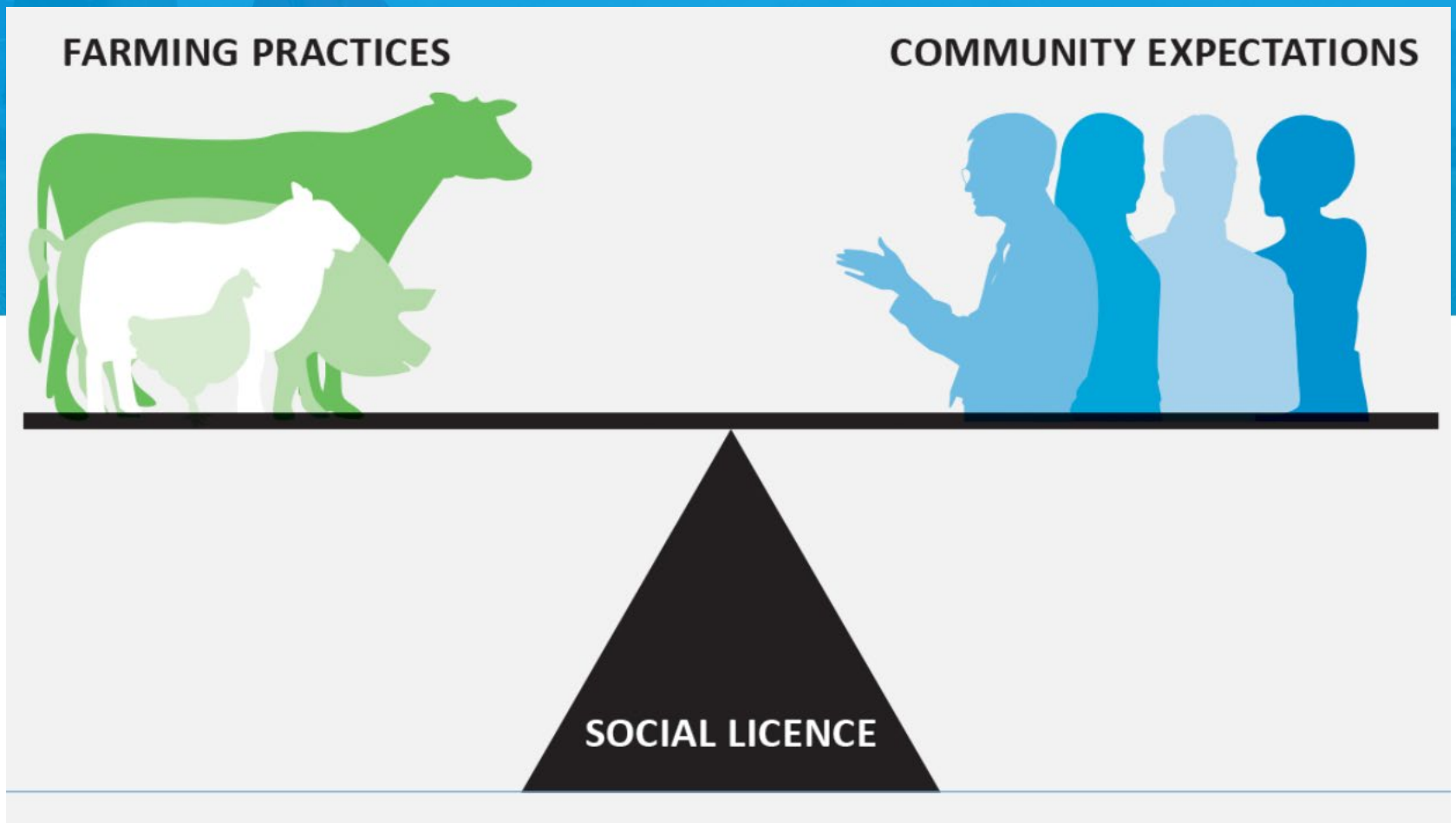
Getting the Balance Right



There's always room for improvement

1. Farm System

Good Farm Practice

1. Benchmark and track your performance
    - Plan, Do, Review
2. Farm for profitability not production
3. Ensure resource use (water, energy, fertiliser, feed) is focused on maximising profitability

There's always room for improvement

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Good Farm Practice

4. Breed animals that optimise profitability
    - Good reproductive performance
    - Efficient production (Kg MS/Kg Liveweight)
    - High longevity

5. Be ready to showcase your farm every day

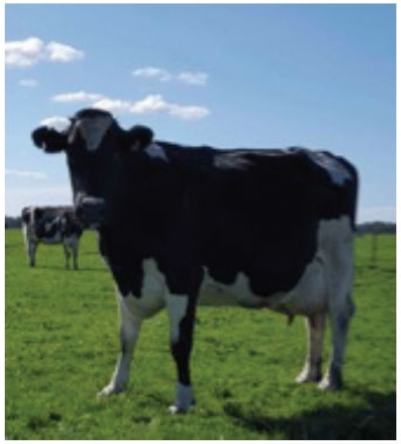
Australian dairy farm emissions

Energy - 10%

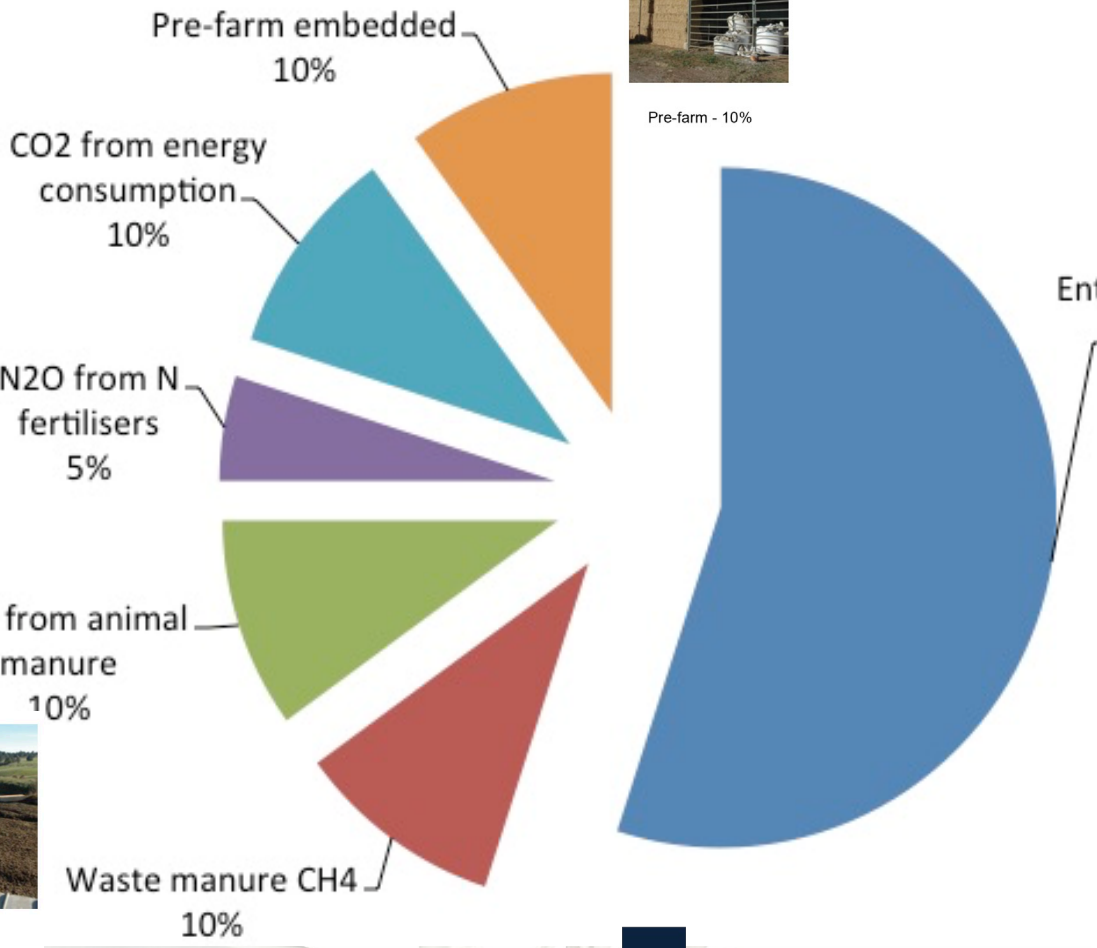
N fertiliser - 5%

Dung, urine, effluent - 20%

Pre-farm - 10%



Cows - 55%



Dairy Australia

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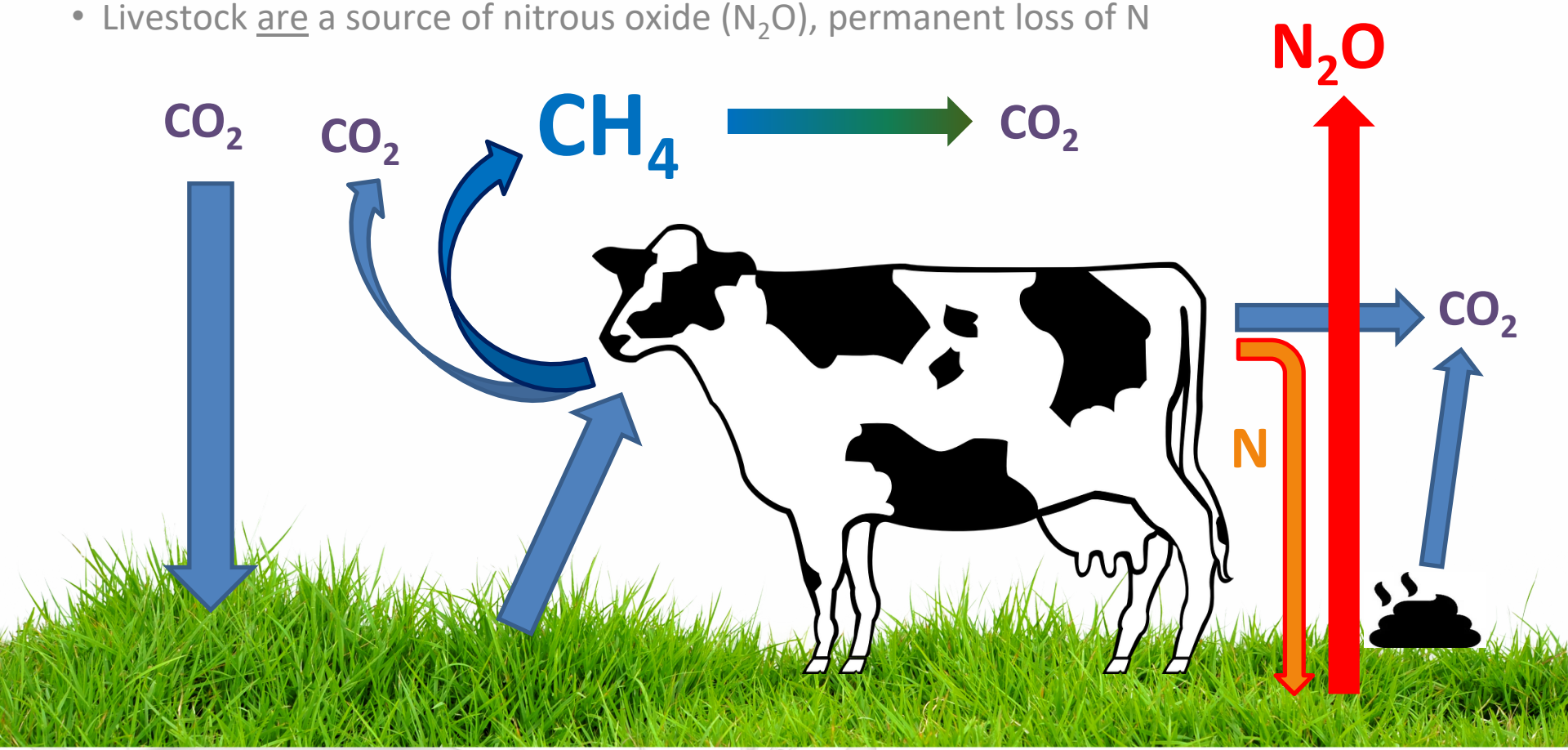
Where do livestock emissions come from?

- Livestock are neither a source nor a sink of carbon dioxide (CO_2)
- Livestock <u>are</u> a source of methane (CH_4), which eventually decays back into CO_2
- Livestock <u>are</u> a source of nitrous oxide (N_2O), permanent loss of N



NEW ZEALAND
AGRICULTURAL GREENHOUSE GAS
Research Centre

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Lowering Emissions

NZ regulations to reduce gross biogenic methane emissions below 2017 level by:

- 10% by 2030
- 24-47% by 2050

All other Greenhouse gases to net zero by 2050.

Australian industry goal of reducing emissions intensity by 30% by 2030

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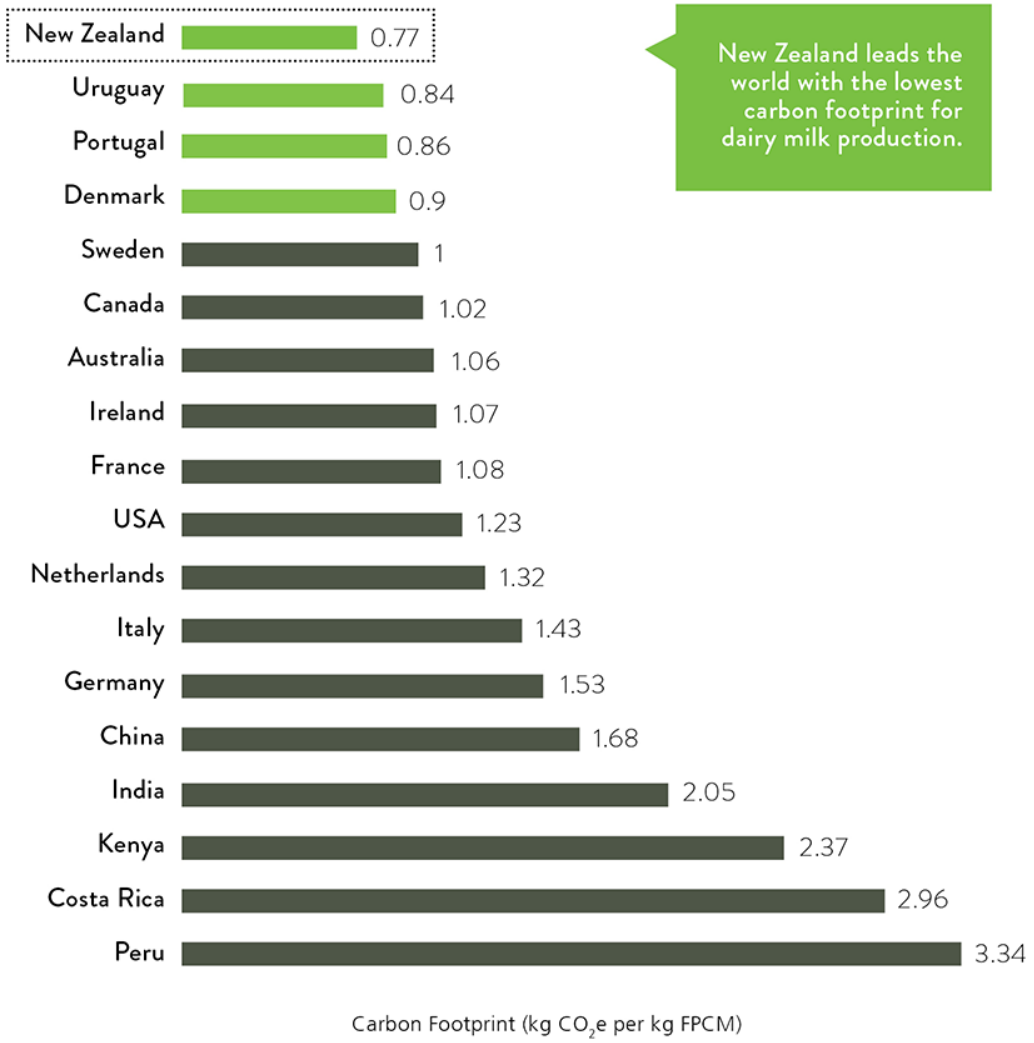
National Average Emissions

Carbon footprint of milk production



New Zealand leads the world with the lowest carbon footprint for dairy milk production.

AgResearch Report 2021

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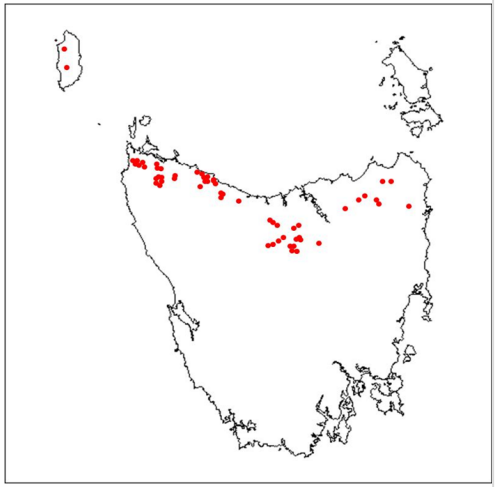
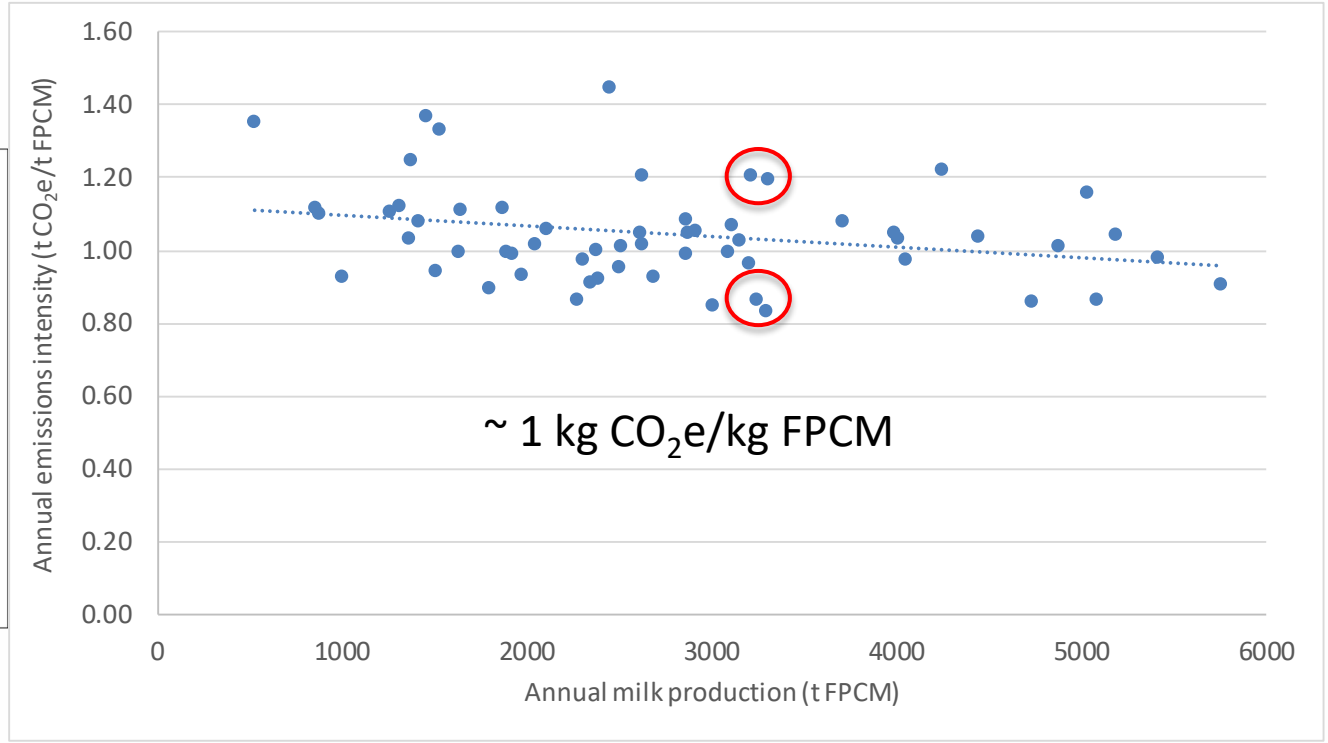
Tasmanian dairy farm emissions

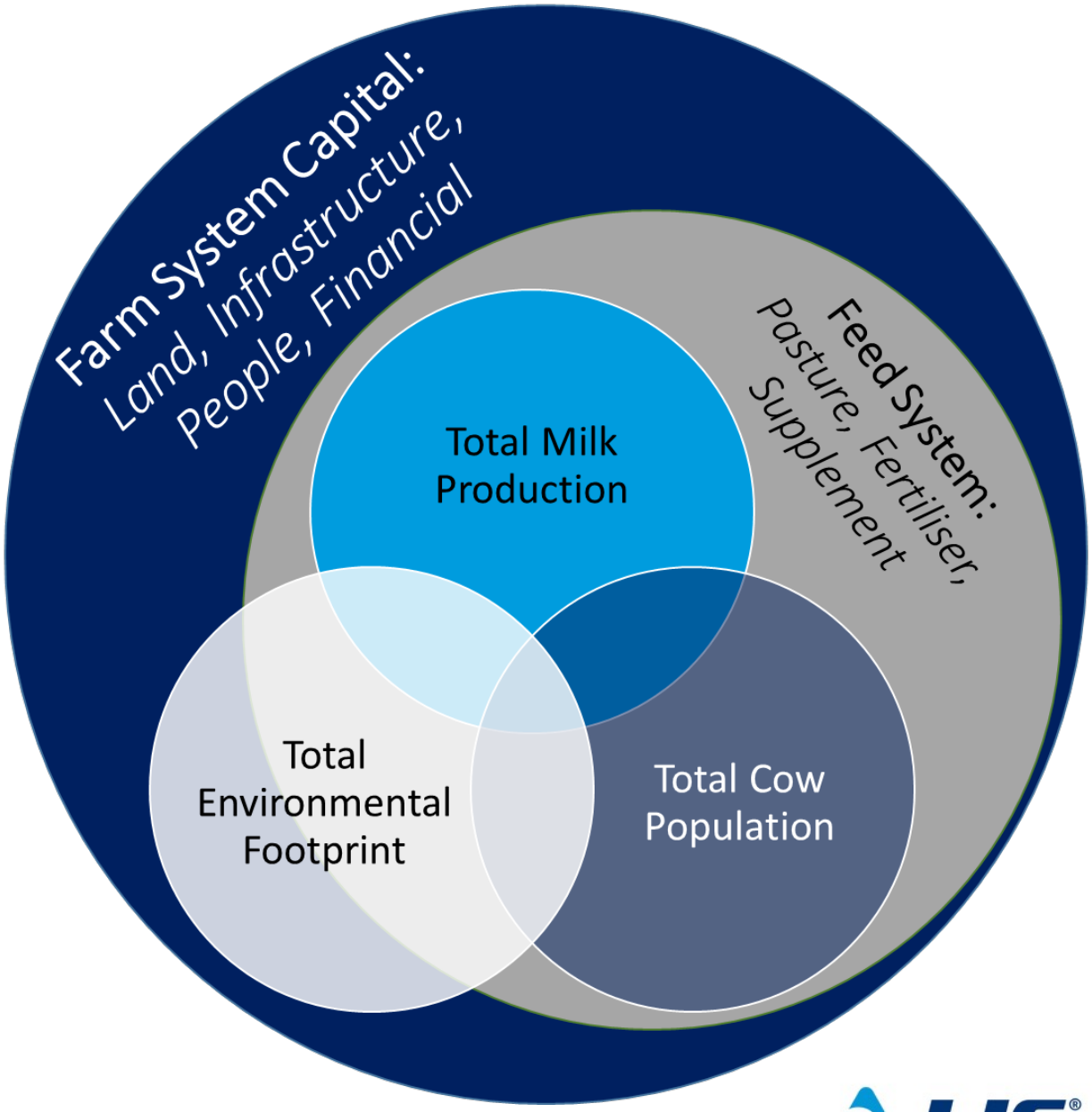
TM60 dataset





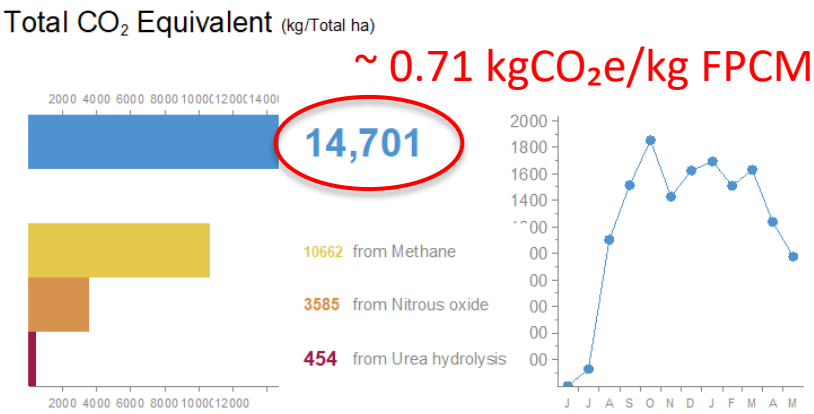
Christie et al. (2011)

Dairy Farm System

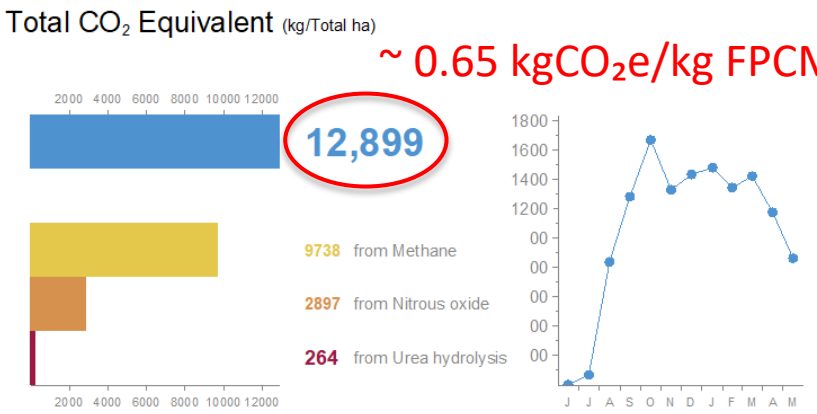


Lincoln University Dairy Farm

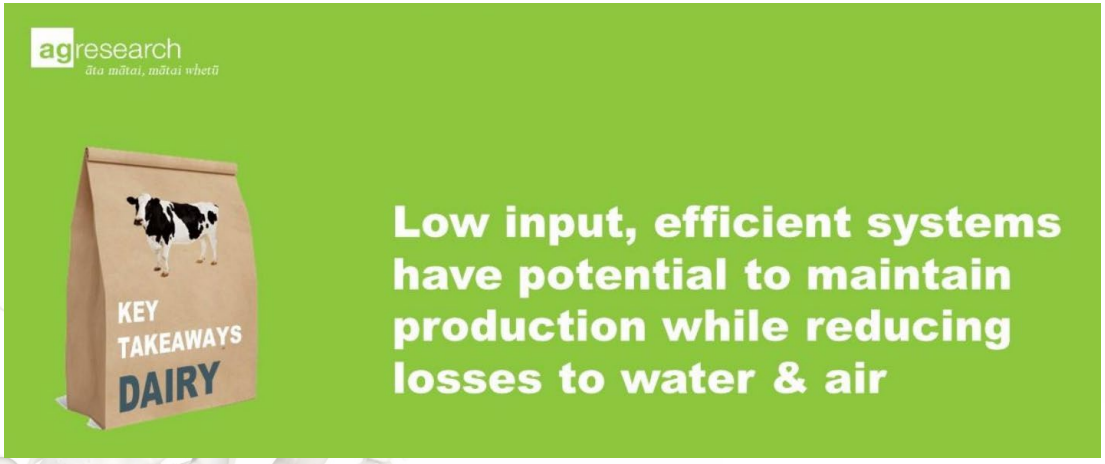
Previous System



Current System



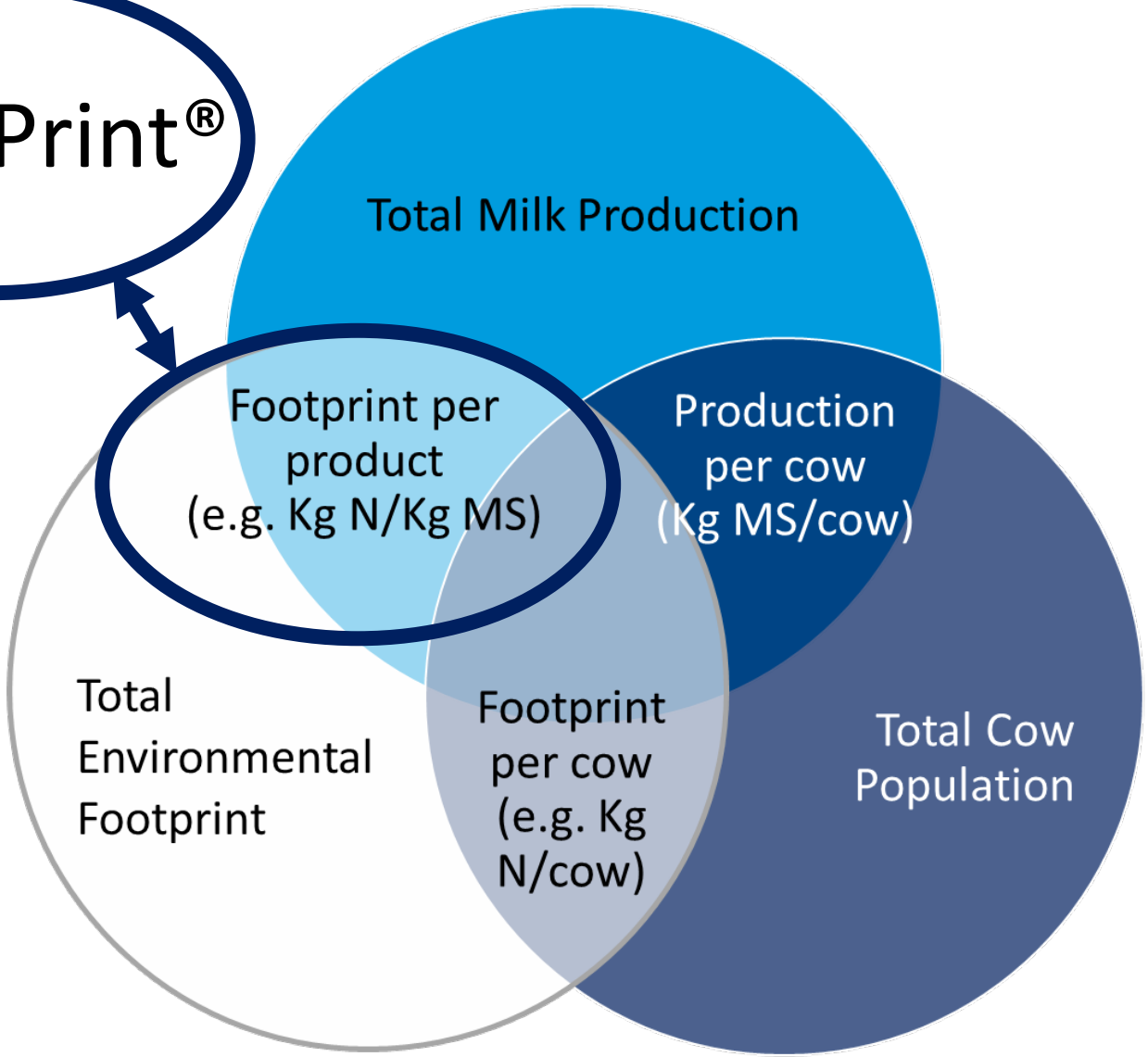
1. Fewer, higher producing cows
2. Reduced N fertiliser & Imported feed
3. Improved pasture management



2. Genetics

HoofPrint®

Environmental Efficiency



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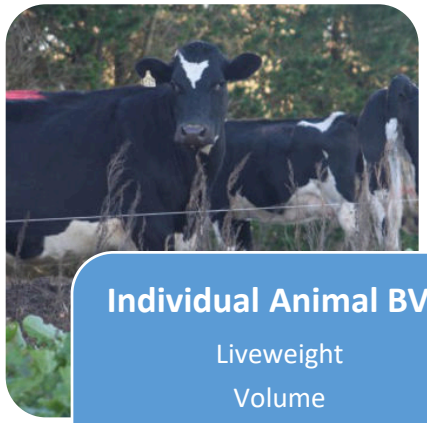
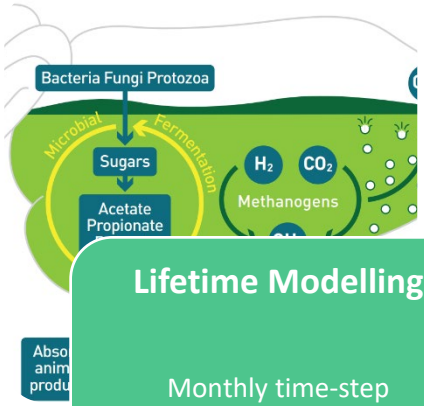
HoofPrint® Model



Individual Animal BV's

Liveweight
Volume
Fat
Protein
Fertility
Total Longevity
Gestation Length



Lifetime Modelling

Monthly time-step
Energy model
Partitioning model
Calving spread
Lactation curves
Culling/Replacement model

Individual Animal Output

Milk production
Urinary Nitrogen
Greenhouse gas emissions (Methane)

There's always room for improvement

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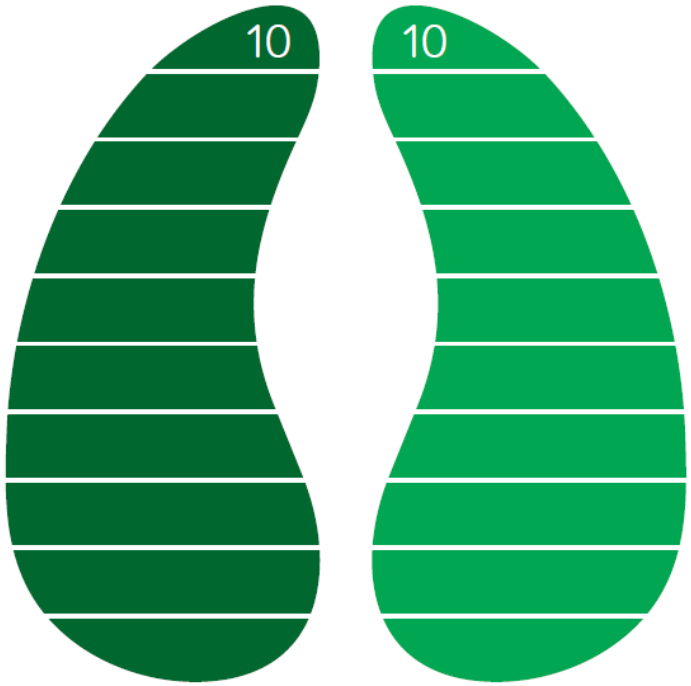
HoofPrint® – 10 point scale



Lifetime enteric methane per lifetime milksolid produced.

Lifetime urinary nitrogen per lifetime milksolid produced.

There's always room for improvement

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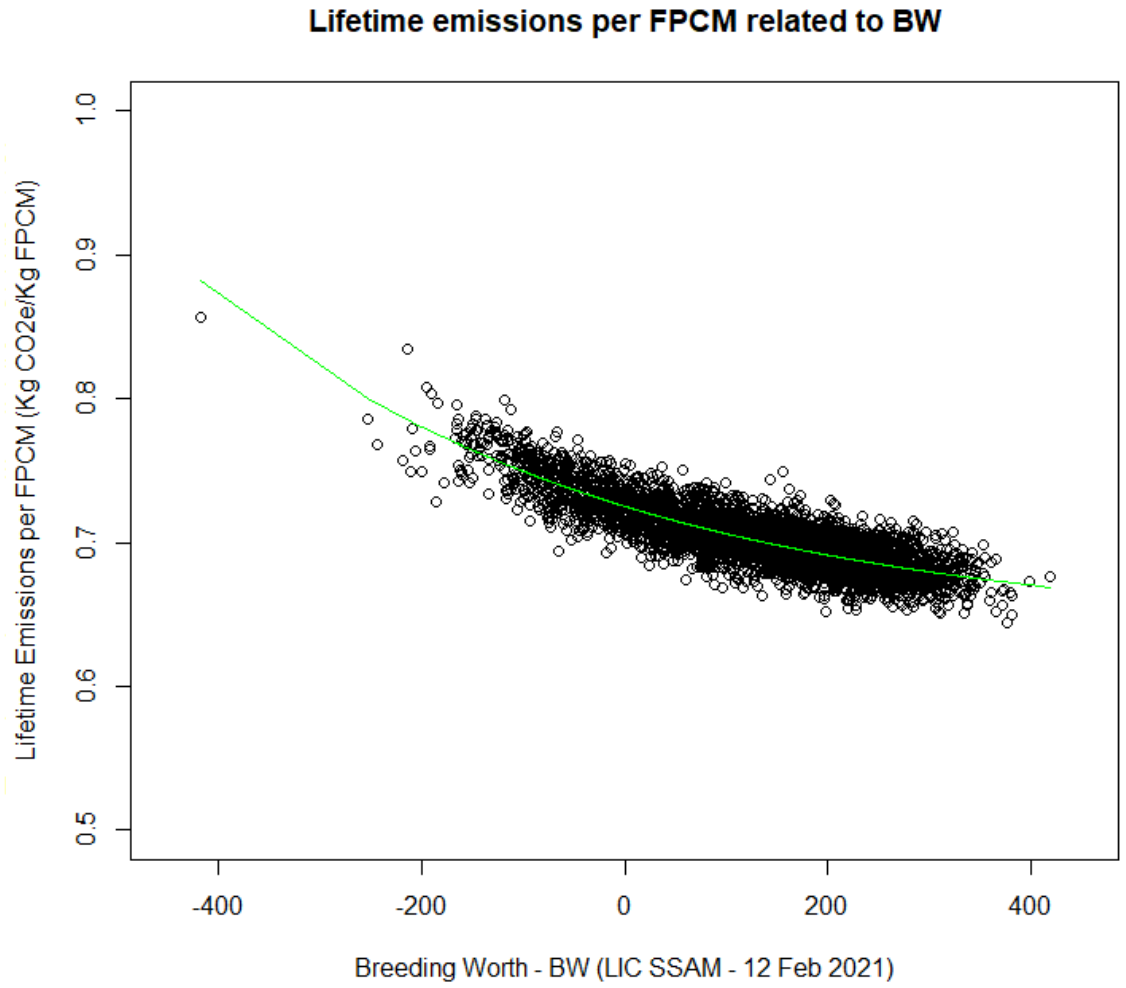
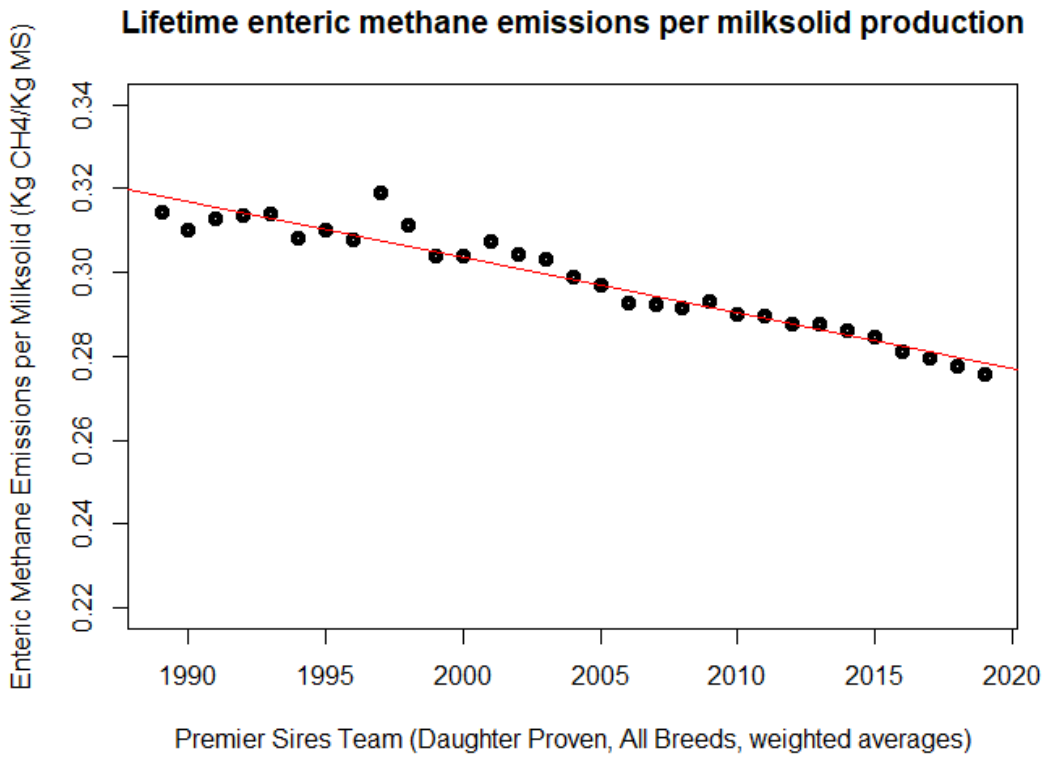
Quantifying enteric methane



For every $10BW increase ~2.0g less methane per Kg of milksolid is produced.

There's always room for improvement

Premier Sires® Daughter Proven Team - Methane



A 13% reduction in methane per Kg of milksolid over 30 years from genetics

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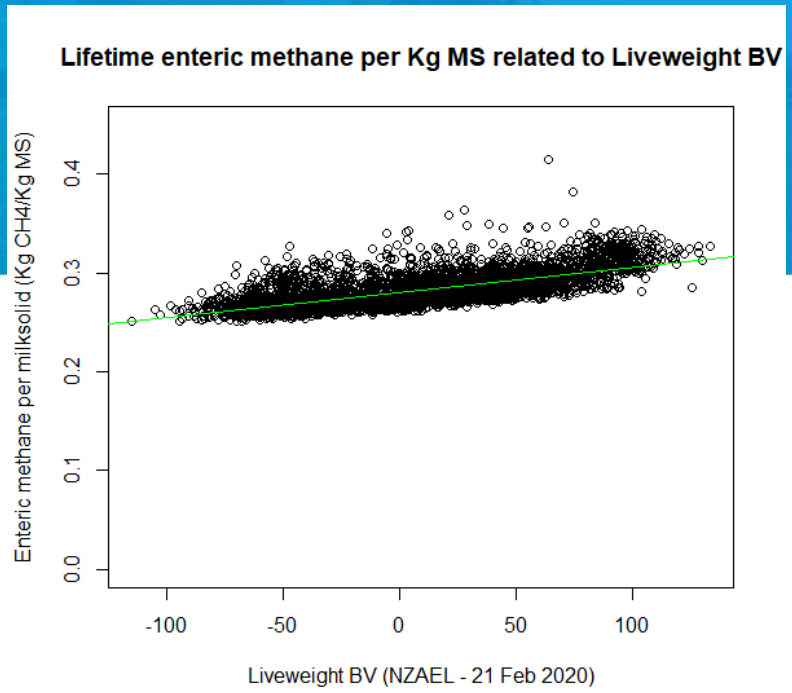
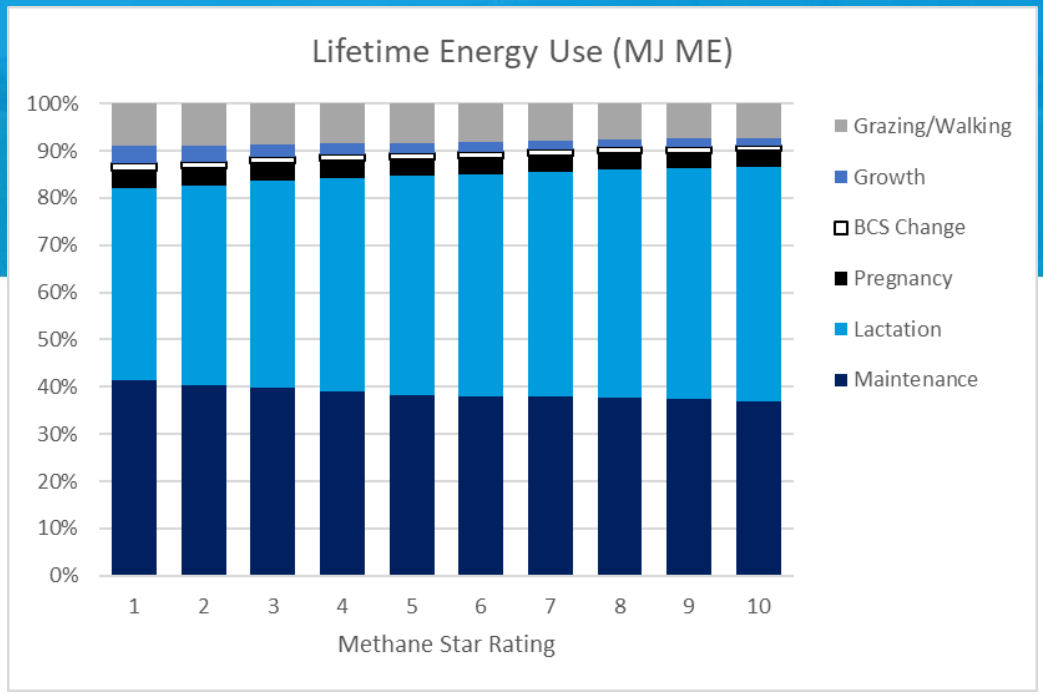
Liveweight & Energy





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Enduring Cows

Increasing the herd average number of lactations from 4 to 5 can:

- Reduce urinary nitrogen per Kg milk solid by 5.2%
- Reduce methane per Kg milk solid by 4.5%

Through:

- Lower replacement rate
- Higher production

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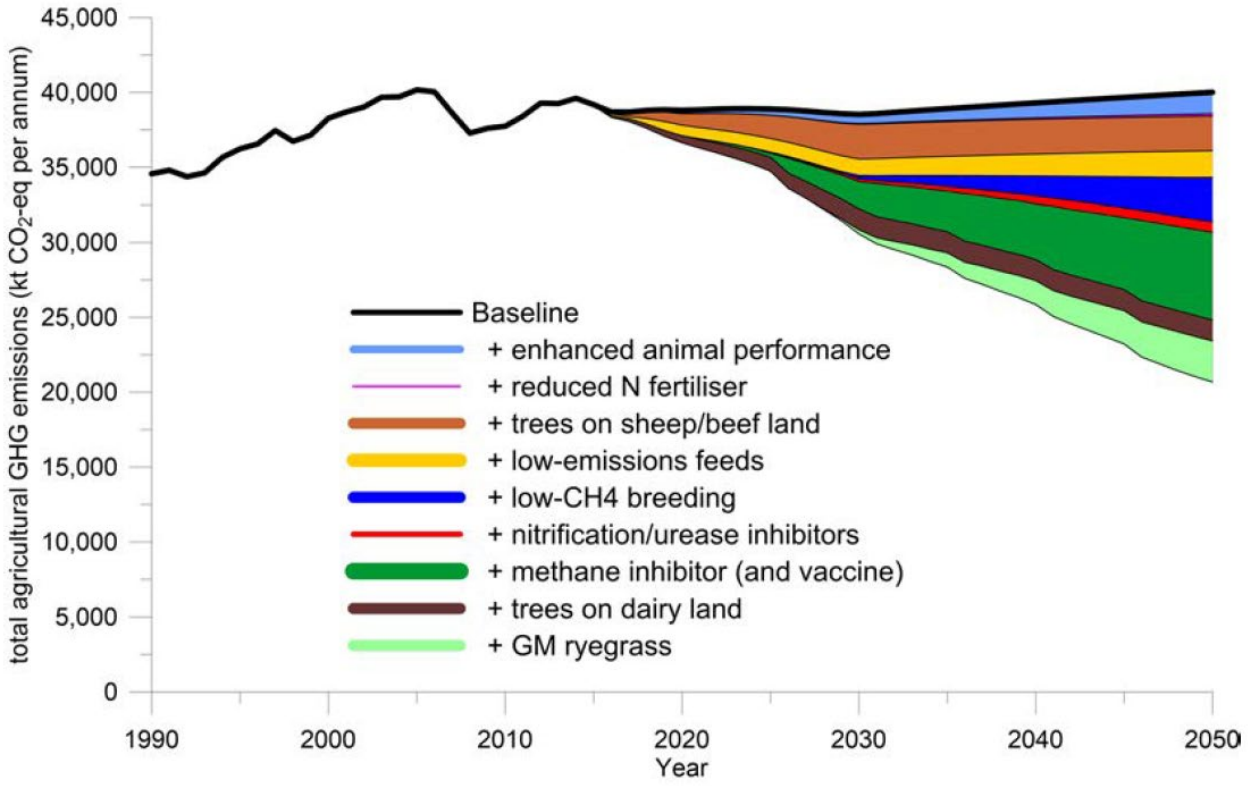
3. Further Research

Possible Ag Emissions Reductions

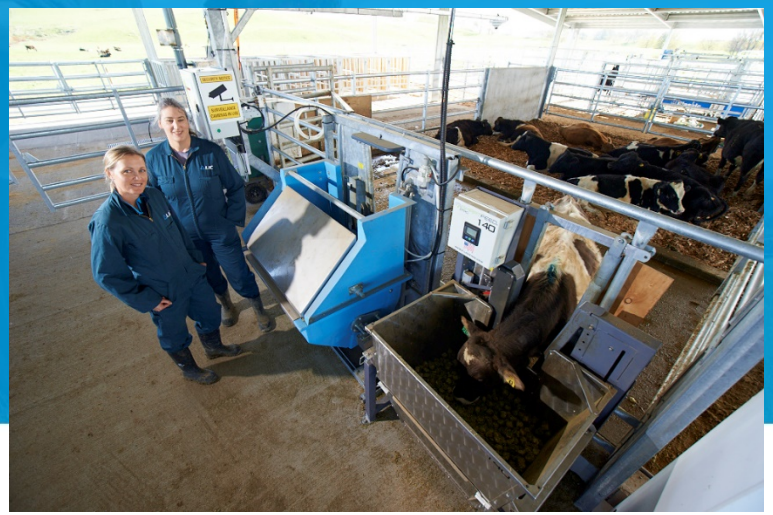
Figure 7: An example of the cumulative effects for a future package of interventions for dairy, sheep and beef



Note: These numbers are based on the most ambitious assumptions about the mitigation potential relating to different options, and farmer uptake of these options.

From: Report of the Biological Emissions Reference Group (BERG), (2018)

Young Bull Methane Project



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Resilient Dairy

Innovative breeding for a sustainable dairy future

Livestock Improvement Corporation Ltd, DairyNZ Ltd and the Ministry for Primary Industries

Thank you ☺

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