Measuring methane emissions and feed intake for Norwegian Red cows in commercial herds

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Aim

Dairy production based on Norwegian feed resources

- Better utilization of roughage
- More roughage
- Improved feed efficiency
- Lower methane emissions

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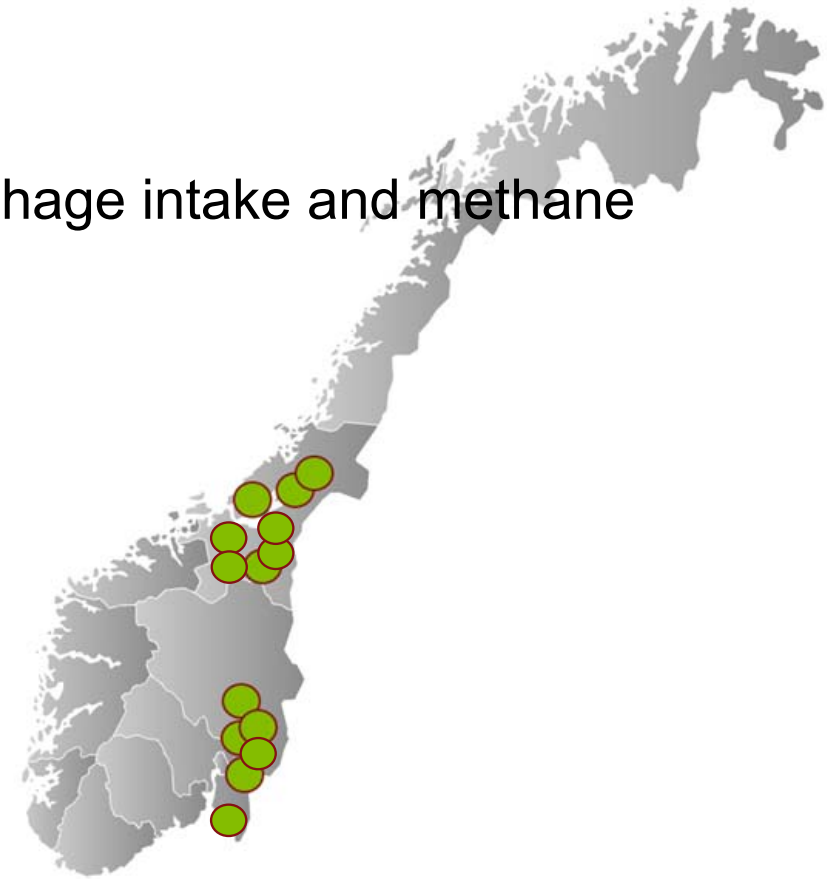
How to achieve our goals ?

- Geno has equipment to measure individual roughage intake and methane
- Commercial dairy herds (**14**) + 2 research herds
- Farms with AMS
- Norwegian Red dairy cows
- Data collection ongoing
- All cows are genotyped (**~ 1.000** pr. Year)



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Measure feed intake (and enteric methane)

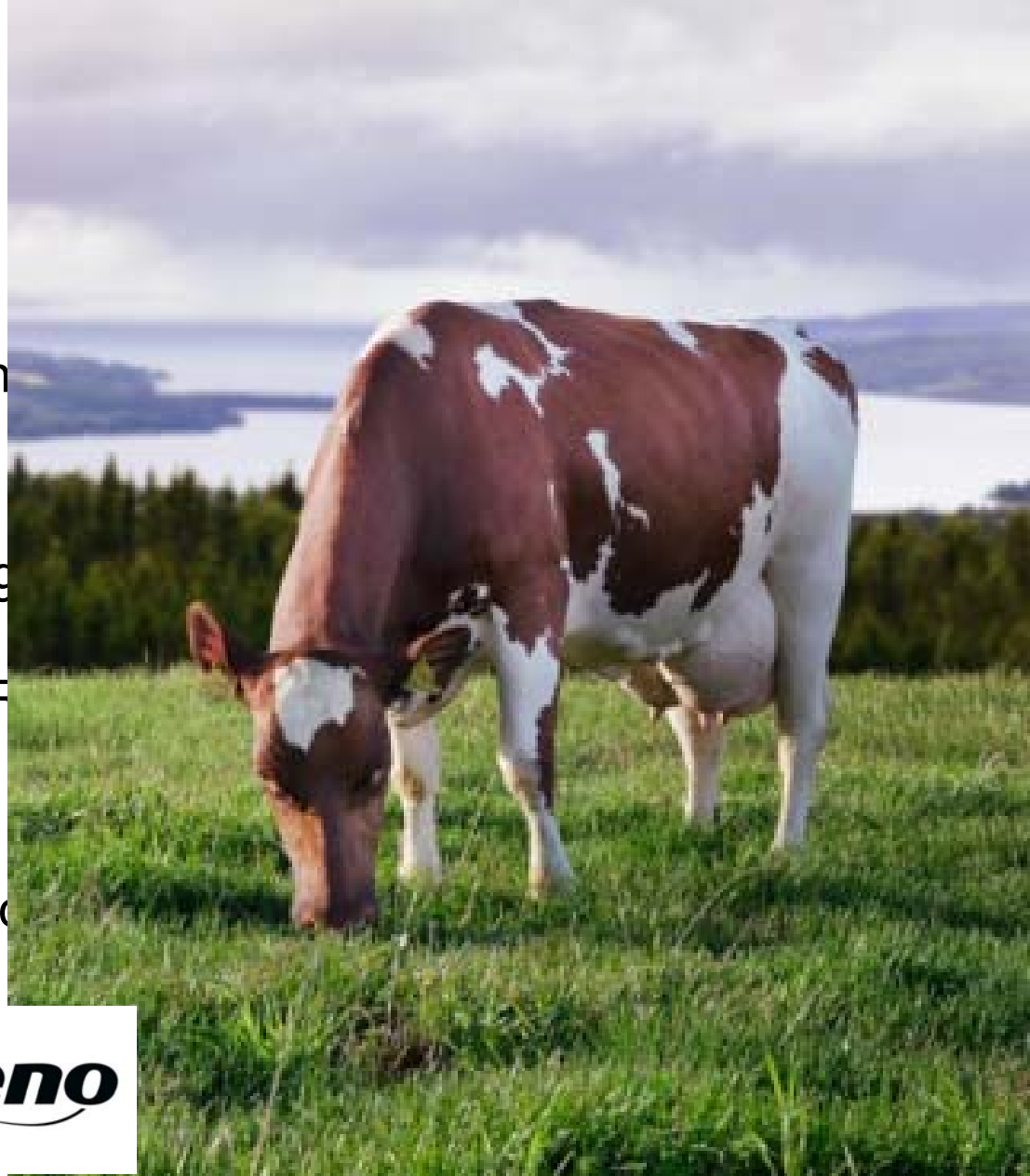
Photo Espen Solli


Photo Espen Solli

Phenotyping of methane

- GreenFeed equipment for CH_4 recordin cows at commercial dairy farms
- Total of **17** GreenFeed units since 201
- **Aim**: Phenotyping ~ **1.000** Norwegian F cows per year

→ Genetic evaluation of methane emissi



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Promising results so far…

- First results gave heritability of **0.22** (~ 250 cows)

Heritability of methane emission in Norwegian Red cows based on measures from GreenFeed in commercial herds

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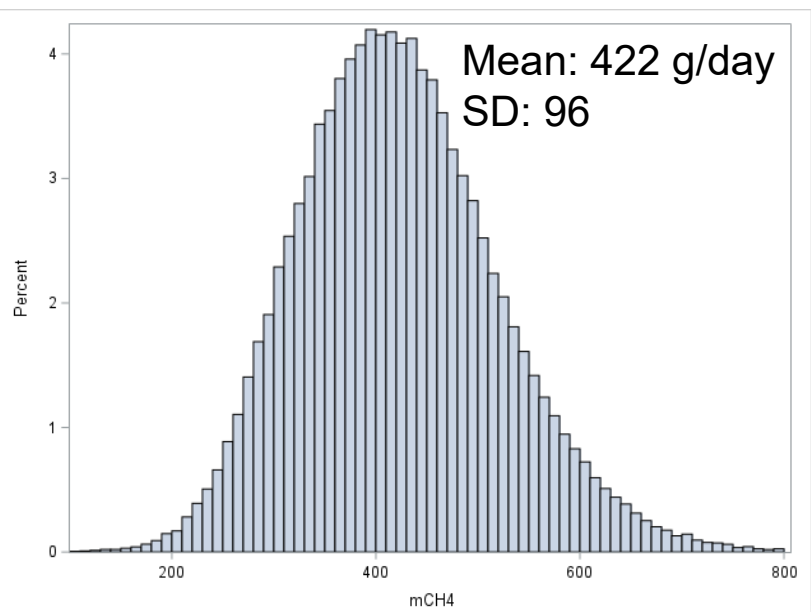

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More data are collected and analyzed…

Methane data from 2020 and 2021:

15 GreenFeed units

814 Norwegian Red cows

370.642 CH4 measures

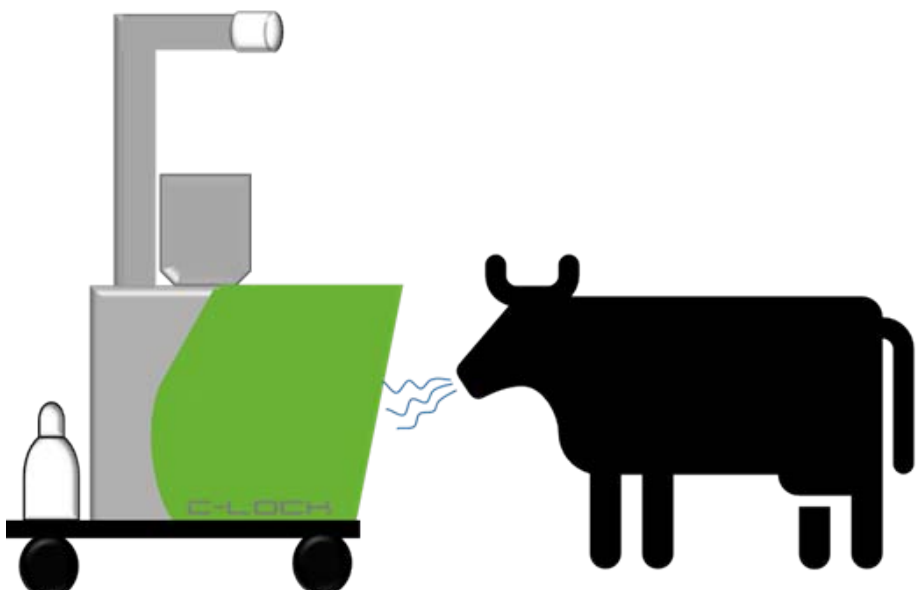


Figure by Kirsti Winnberg

Heritabiliy of methane emissions

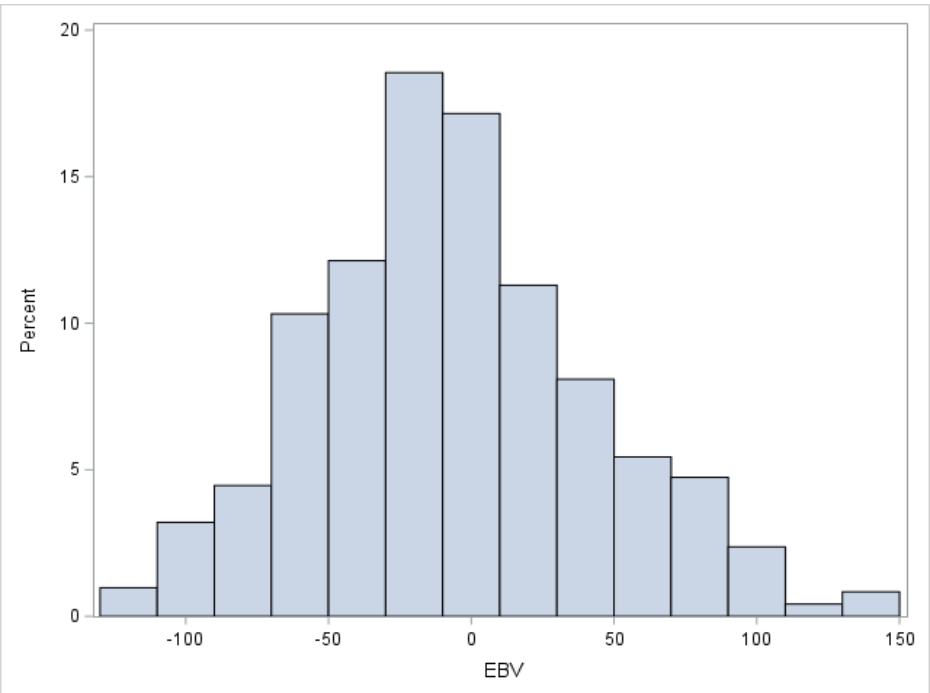
CH4 g/day average per cow per day:

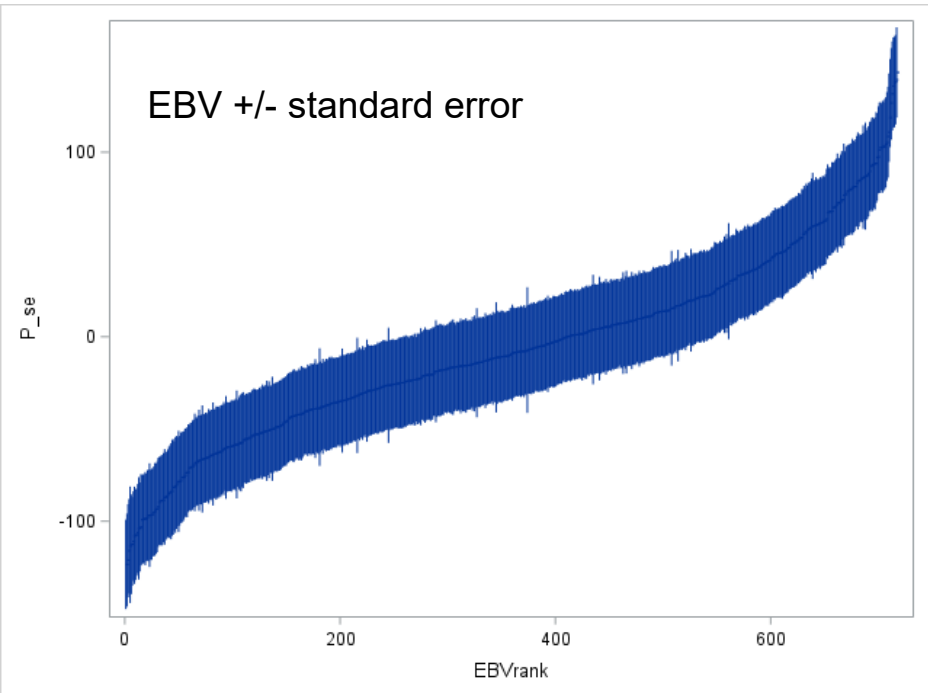
Variance component	estimate	se
Herd-Testday	910	23
Additiv genetic	2969	430
Permanent environment	630	296
Residual	4062	18

Heritability: 0.34

Photo Nathalie Bjørnebye

Breeding values of methane production in Norwegian Red cows





EBV given as CH4 g/day

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Heritabiliy of feed intake - DMI

Dry matter intake (roughage + concentrate)
kg/day per cow per day:

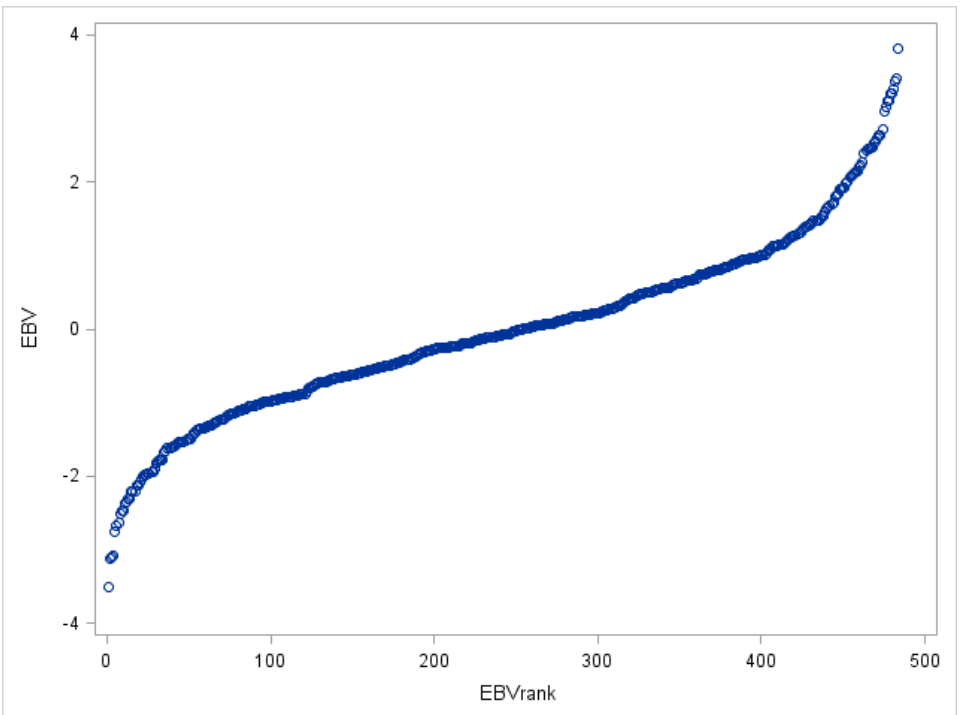
Variance component	estimate	se
Herd-Testday	4.42	0.19
Additiv genetic	2.81	0.79
Permanent environment	2.33	0.64
Residual	5.75	0.03

Heritability: 0.18

Breeding values daily dry matter intake

Dry matter intake (roughage + concentrate)
Kg/day per cow per day:

Number of Cows	Mean (sd)	Min	Max
484	-0.01 (1.22)	-3.49	3.81



EBV given as DMI Kg/day

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Further research

- Trait definition CH4 (and feed efficiency)
- Accuracy of genomic breeding values
- Genetic associations to other important traits
- Feed efficiency, milk yield, health and fertility…

We aim to balance climate effects, feed efficiency, production, health and fertility in a sustainable breeding goal for Norwegian Red

Conclusion: *Data collection of CH4 & feed intake works !*

Photo Nathalie Bjørnebye

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