Feed & Gas

ICAR Working Group Who? Why? What?

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Feed & Gas working group who?

<table>
<thead>
<tr>
<th>Chair</th>
<th>Roel Veerkamp</th>
<th>Yvette de Haas</th>
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<tr>
<td><strong>Members working group</strong></td>
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<tr>
<td>Jennie</td>
<td>Pryce</td>
<td>Australia</td>
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<td>Filippo</td>
<td>Miglior</td>
<td>Canada</td>
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<td>Nina</td>
<td>Krattenmacher</td>
<td>Germany</td>
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<td>Raffaella</td>
<td>Finocchiaro</td>
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<td>Birgit</td>
<td>Gredler</td>
<td>Switzerland</td>
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<td>Phil</td>
<td>Garnsworthy</td>
<td>United Kingdom</td>
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<td>Rouillé</td>
<td>Benoît</td>
<td>France</td>
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<td>Jan</td>
<td>Lassen</td>
<td>Danemark</td>
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<td>Gilles</td>
<td>Renand</td>
<td>France</td>
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<td><strong>Industry liaison group</strong></td>
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<td>Marco</td>
<td>Winters</td>
<td>UK</td>
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<td>Daniel</td>
<td>Abernethy</td>
<td>AUS</td>
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<td>Juan</td>
<td>Pena</td>
<td>Spain</td>
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<tr>
<td>Andrew</td>
<td>Cromie</td>
<td>Ireland</td>
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<tr>
<td>Sijne</td>
<td>Van Beek</td>
<td>The Netherlands</td>
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Why?

Feeding 9 billion people within the carrying capacity of planet earth

Livestock 18% of total global anthropogenic GHG emissions

Globally resources efficiency important
Why? Economic importance farm level

UNIVERSITY OF ILLINOIS
Agricultural Experiment Station.

URBANA, NOVEMBER, 1901.

BULLETIN No 66.

INDIVIDUAL DIFFERENCES IN THE VALUE OF DAIRY COWS.

BY WILBER J. FRASER, INSTRUCTOR IN DAIRY HUSBANDRY, COLLEGE OF AGRICULTURE AND CHIEF IN DEPARTMENT OF DAIRY HUSBANDRY, AGRICULTURAL EXPERIMENT STATION.

Common observation teaches us that different cows produce different amounts of milk and butter-fat in the same period of time, but it does not inform us whether the food consumption differs in proportion to yield, or whether one cow may actually manufacture more than another out of the same amount of feed. The question then arises, will two cows fed on the same feeds make the same returns, and, if not, will the yield be in the ratio of the feeds consumed.

Journal of Heredity (1911) os-6:295-300

COW-TESTING ASSOCIATIONS.

countries. They have become widely disseminated in Sweden and Norway, and there are now control associations in Finland, Russia, Germany and Scotland. In most places an attempt is made to carry out the weighing and valuation of the feed, as in Denmark; but, in some parts of Norway, where the cows subsist entirely on grass in the summer and on hay and straw in the winter, it is thought that the estimate of the feed will be too inaccurate, and therefore the work of the control assistant is limited to managing the test milking, testing for butter fat, and keeping a record of the milk and butter yield.

Where there is no record of the consumption of feed, there will be no basis for a fair comparison of the milk and butter yield in the various herds, because the amount of feed will always affect the yield of butter; but, even without a record of the feeding, the “control” will give every farmer valuable information regarding the yield of milk and butter of the individual cows, so that he can positively distinguish the best, the good, and the poor cows; and he gets an opportunity to find those cows that give particularly rich milk, which is of immense importance, if it is, as we believe, that giving rich or poor milk is for each cow a peculiar and inherited quality.
Why?

Cows with feed intake/GHG records and DNA

Bulls with DNA

Genomic selection enables animal breeding without progeny testing

Breeding value for feed intake
Measuring individual feed intake (DMI)

- Insentec RIC system
- Calan Broadbent equipment
- Growsafe system
- n-alkane technique
- NZ & Aus Callagher equipment
Measuring methane

Respiration chambers

Laser

Boxes

Sniffers in robot

Head hoods

Greenfeeder

SF6
Many international initiatives

1. RobustMilk
2. Australasian RFI project
3. Global Dry Matter Initiative: gDMI
4. RFI: Michael VanderHaar
5. FUNC (Feed Utilization in Nordic Cattle)
6. Efficient Dairy Genome Project Canada
METHAGENE

- AT; BE; CH; DE; DK; ES; FI; FR; GR; ISR; IE; IT; LT; MAC; NL; NO; PL; PT; SE; SLO; SK; TU; UK

- >150 participants
- >30 institutions
  - Academic
  - Government
  - Industry
Why feed & gas working group?

Important societal challenges for livestock production related to resources efficiency

Genomic selection and new recording technologies provide the potential for animal breeding to become part of the solution

Many international initiatives on-going

Australia and the Netherlands have introduced feed efficiency in national breeding index
Priorities Feed&Gas working group

- International forum to stimulate collaboration; maintain the momentum established by gDMI

- ICAR guidelines for recording DMI and methane

- Survey among ICAR members

- Business and operational model → Service ICAR?
Maintain momentum gDMI2

Subprojects:

1. Develop protocol and database for sharing phenotypes
2. Improved genomic prediction with more data and enhanced modelling
3. From biology of feed efficiency to breeding goals for efficiency
4. Utilising across breed information with sequence data
5. Proxies (MIR, type, sensors, ...) for cost-effective prediction of feed intake related traits
6. Economic values and breeding strategies
Current scope of guidelines feed intake

1. Utilizing existing feed intake data
2. Setting up data recording
3. Recording indoors and at pasture
4. Additional recording of traits
5. Bulls, cows and young stock
6. Lactation period
7. Feeding system
8. Genotype

10. Merging and sharing data in genetic evaluations

- Very much in research arena
- What questions do you have?
Survey among ICAR members

1. Data and Recording Methods for Feed Intake and Methane Emissions

2. Selection Goals for Methane Emissions and Feed Intake Traits

3. Genetic evaluation
Current answers status

to participate contact us at:

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<th>Invited</th>
<th>Total takers</th>
<th>Complete responses</th>
<th>Partial responses</th>
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<tr>
<td>1. Data collection</td>
<td>120</td>
<td>19</td>
<td>7</td>
<td>12</td>
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<td>2. Evaluation</td>
<td>118</td>
<td>5</td>
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Special acknowledgement to Cesare Mosconi
Summary

- Feed & Gas working group
  - Resources efficiency important
  - Genomic selection enables animal breeding
  - Many global initiatives

- Current priorities
  - Forum for collaboration: gDMI
  - Guidelines fro DMI and methane
  - Survey