



THE GLOBAL STANDARD  
FOR LIVESTOCK DATA

Network. Guidelines. Certification.

# Update ICAR Feed&Gas WG: guidelines and international collaboration for genetic evaluation

Birgit Gredler-Grandl and the members of the  
ICAR Feed&Gas working group



## ICAR Feed and Gas WG

- WG has been formed in 2015 with the main objectives:
  - Update and extend guidelines for recording and evaluation of dry matter intake and methane emission
  - Provide a forum for international exchange of knowledge and coordinate international collaboration in research and development
  - Conduct periodic international surveys
  - Elaborate/promote systems for international genetic evaluation for feed efficiency and methane emission



## Members of the WG

- 8 members
  - Christine Baes (University of Guelph, Canada)
  - Phil Garnsworthy (University of Nottingham, UK)
  - Raffaella Finocchiaro (ANAFIBJ, Italy)
  - Jan Lassen (VikingGenetics, Denmark)
  - Birgit Gredler-Grandl (Wageningen University Research, The Netherlands, Co-chair)
  - Nina Krattenmacher (Christian Albrecht Universitaet Kiel, Germany)
  - Jennie Pryce (Agriculture Victoria, Australia)
  - Roel Veerkamp (Wageningen University Research, The Netherlands, Chair)

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**Industry liaison group**

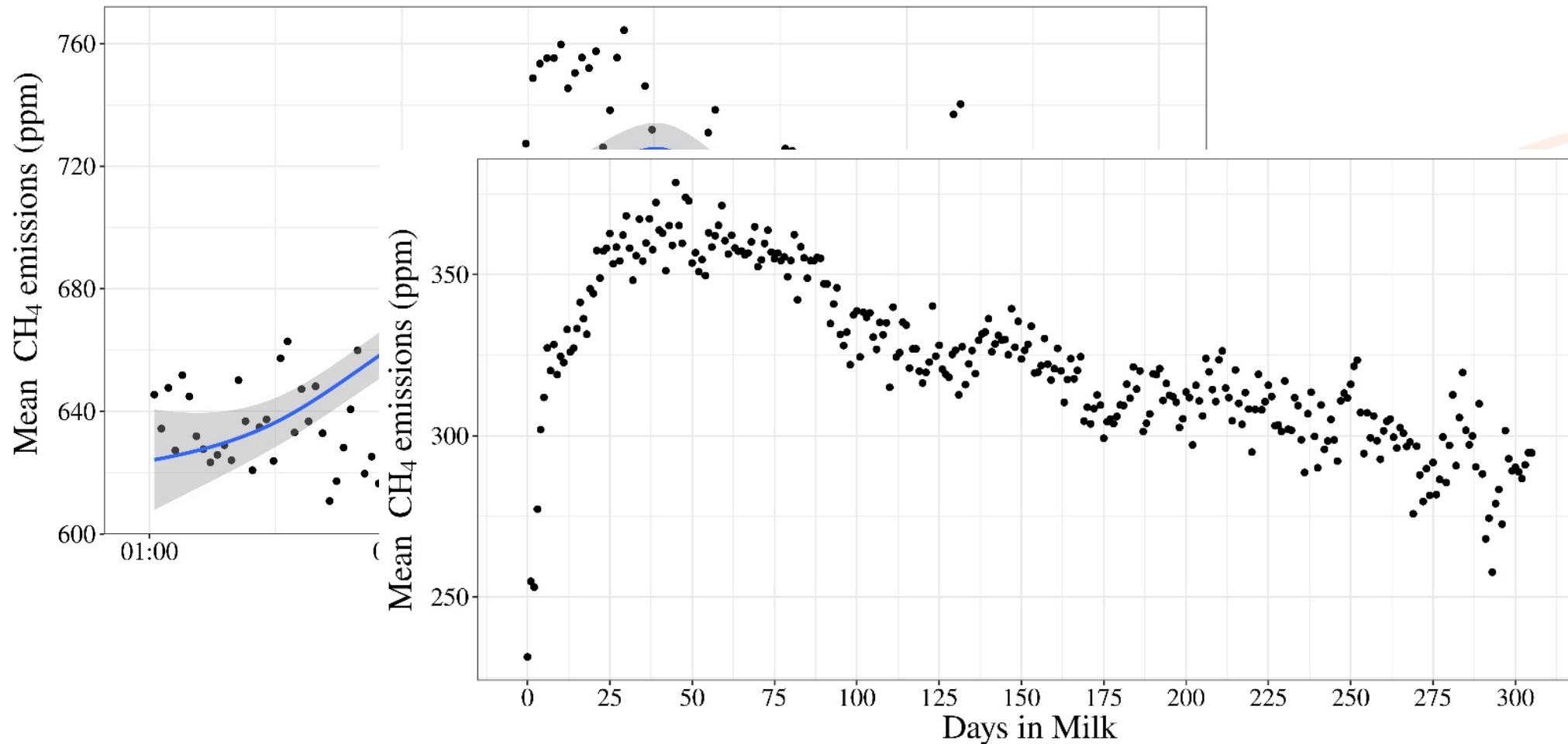
**Research liaison group**

## Update guidelines for Feed Intake and methane emission

- Guidelines published 2020
- Update and review content:
  - Provide rules for calculation of phenotypes
  - New methods: e.g. 3D cameras to measure DMI
  - Hands on tips how to edit raw data to get a reliable record
  - Rank methods according accuracy



# Update guidelines for Feed Intake and methane emission

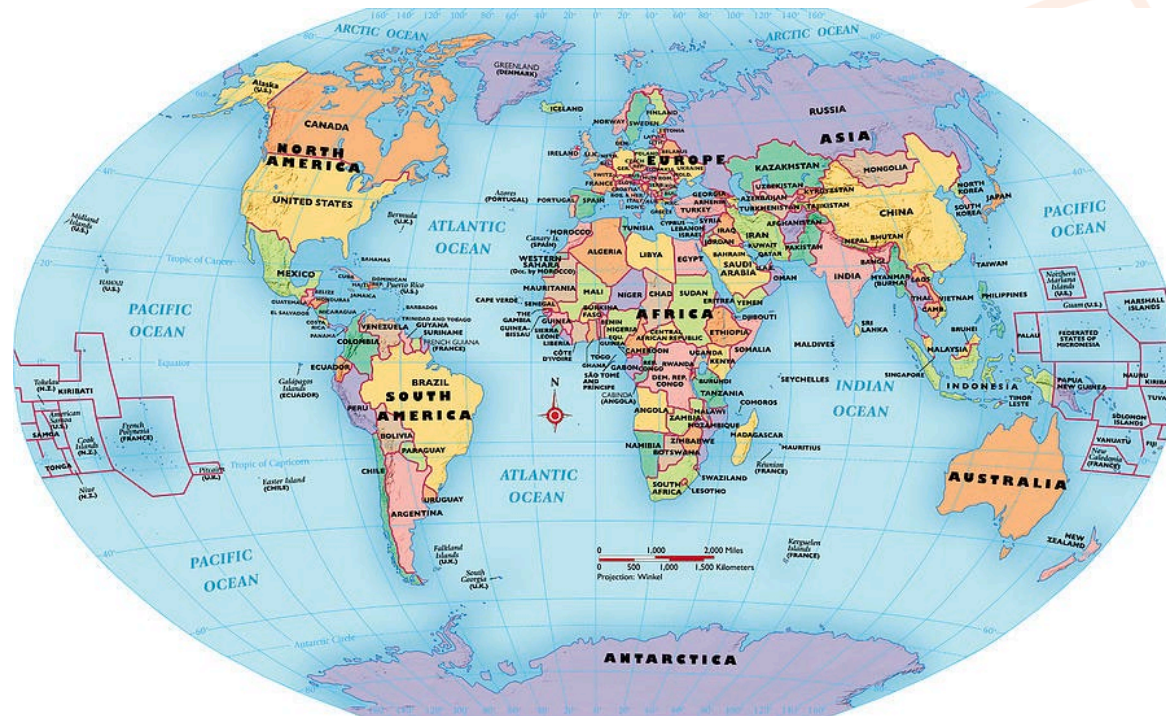


## Information routine genetic evaluation feed intake

- Routine genetic evaluation implemented in Australia, Canada, Denmark, Finland, The Netherlands, New Zealand, Norway, United Kingdom, USA
- Information will initially be collected via Interbull genetic evaluation form (GE form)
- Implementation in Interbull PREP data base providing description of phenotype recording, data editing, genetic evaluation systems and publication policies

## International collaboration for genetic evaluation

- Large reference populations are required to achieve desirable reliabilities of genomic breeding values
- Phenotyping of thousands of animals real challenge





# Global Dry Matter Initiative - gDMI

- 15 partners – 9 countries
- 10,000 phenotyped and 6,000 genotyped cows in reference population for genomic prediction
- Clear benefits in increasing the reliability

## Global Dry Matter Initiative (gDMI)



J. Dairy Sci. 98:6522–6534  
<http://dx.doi.org/10.3168/jds.2014-9257>  
 © American Dairy Science Association®, 2015.

**Genomic prediction of dry matter intake in dairy cattle from an international data set consisting of research herds in Europe, North America, and Australasia**

Y. de Haas,<sup>\*1</sup> J. E. Pryce,<sup>†‡</sup> M. P. L. Calus,<sup>\*</sup> E. Wall,<sup>§</sup> D. P. Berry,<sup>#</sup> P. Løvendahl,<sup>||</sup> N. Krattenmacher,<sup>¶</sup> F. Miglior,<sup>\*\*††</sup> K. Weigel,<sup>‡‡</sup> D. Spurlock,<sup>§§</sup> K. A. Macdonald,<sup>##</sup> B. Hulsege,<sup>\*</sup> and R. F. Veerkamp<sup>\*</sup>





# Resilient Dairy Genome Project (RDGP)

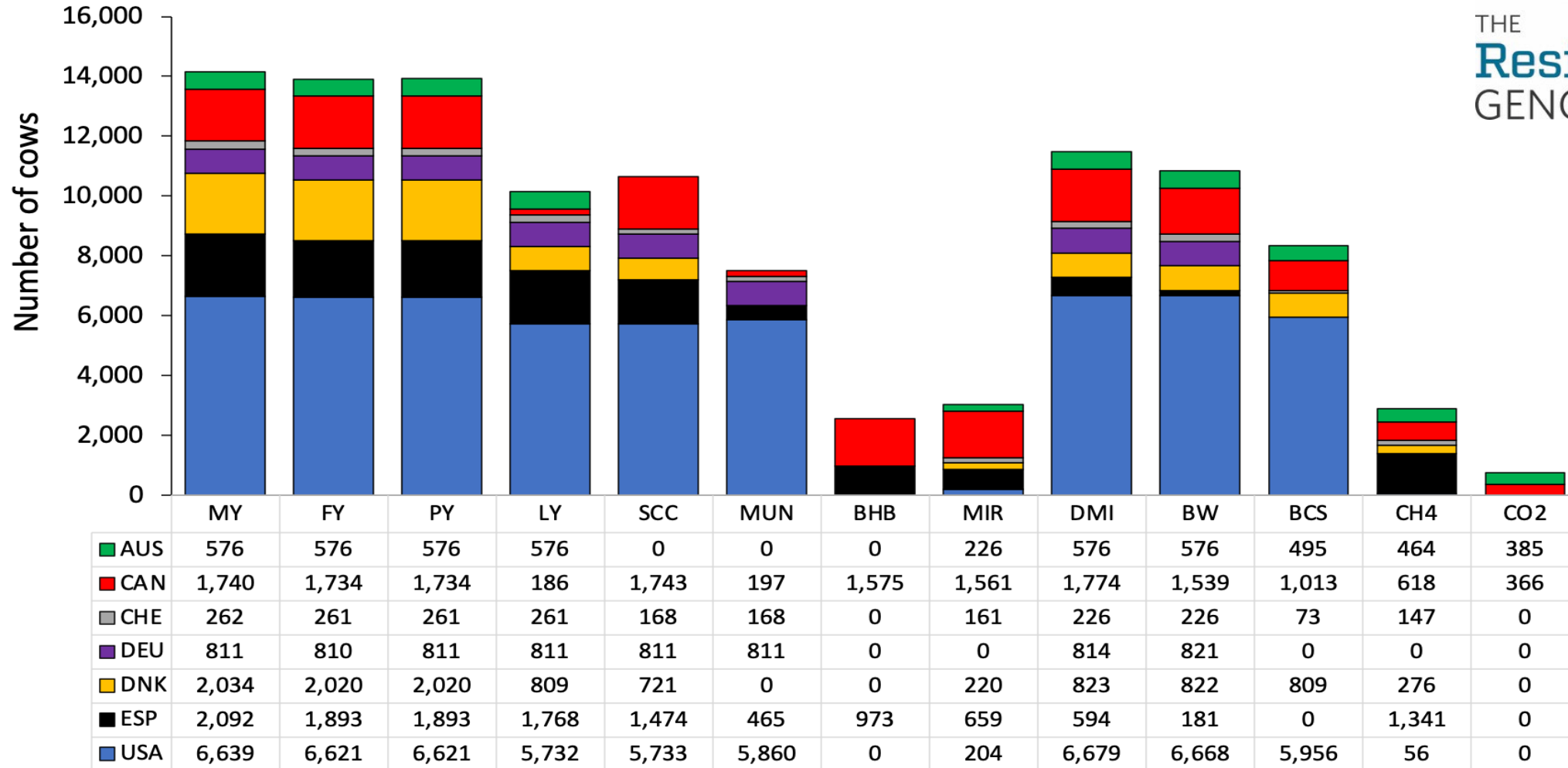
- Large-scale applied research project
- Genomic tools for more resilient dairy cattle
- Build a large international reference population for feed efficiency and methane emission by 42 institutions
- Goal:
  - 17,000 cows for feed efficiency
  - 7,800 cows for methane emission



# Resilient Dairy Genome Project (RDGP)



THE  
**Resilient Dairy**  
GENOME PROJECT





## Re - Livestock

Facilitating Innovations for **Resilient Livestock** Farming Systems

- new project under HORIZON-CL6-2021-CLIMATE-01-06
- Overall objective: adopt/apply practices cross-scale (animal, herd/farm and sector) to reduce greenhouse gas emission of livestock and increase resilience of the livestock sector
- What is the contribution of breeding to climate change mitigation and adaptation of livestock to climate change?
- Phenotypes and genotypes of around 13,000 cows will be shared to perform multi-trait analysis across countries

## International collaboration – sharing data

- Very successful in research projects
- Data ownership issues
- Commercial interests in different countries
- Possibilities for the future:

Interbull Existing/Developing Services	Required Input	Required National Evaluation	Output
MACE	Nat EBV + ped	Conventional Evaluation	Int EBV
GMACE	Nat GEBV + int EBV + ped	Genomic Evaluation	Int GEBV
InterGenomics	Genotypes + int EBV + ped	Conventional Evaluation, Genomic evaluation (optional)	DGV, int GEBV, SNPs effects
SNP MACE	Nat SNP effects	Genomic evaluation	Int SNP effects
InterBeef	Phenotypes + ped	Conventional Evaluation	Int EBV



## Looking for new members!

- New topics
  - Prediction of feed intake and methane emission – MIR, sensors
  - Link with ExtraMIR
  - Contribution to sustainability – ICAR STF
  - Trait definitions/breeding goals
- Send statement of interest with short motivation and experience to [birgit.gredler-grandl@wur.nl](mailto:birgit.gredler-grandl@wur.nl)



Thank you very much!



<https://www.icar.org/index.php/technical-bodies/working-groups/working-groupsfeed-and-gas/>