

# Global Methane Genetics: accelerating genetic progress to reduce methane in ruminants



# Why? How? What?



- Genetic progress can make a **permanent** and **impressive contribution** to reducing methane output from livestock systems **globally**, we aim to accelerate genetic progress and to implement breeding strategies for reduced methane emissions in Ruminants in the **global North and South**
- To support **sharing of protocols** and **data**, to **expand phenotyping, breeding program design** and **genetic evaluations**, underpinning the development of Global Livestock Genetics and Genomics Programs
- WUR will coordinate a **partnership** between science (a range of universities and research institutes, breeding companies), governments, foundations and private sector partners, and work with the global membership network of ICAR (around 130 organizations from around 60 countries).

**Protocols  
&  
network building**

**Data  
&  
phenotyping**

**Implementation:  
genetic evaluation &  
breeding program**

**1) Working Groups**

WG1: Dairy global North

WG2: Small ruminants

WG3: Beef global North +

WG4: Asia

WG5: Africa

WG6: South America

WG7: Buffalo & ruminants

**Research &  
Phenotyping proposals**



**2) Database**

- legal
- technical
- organisation

**3) Animal  
breeding  
research**

# How to participate?

1. Join and contribute to activities & network
  - Working groups: discuss, share, learn
  - Focussed webinars or workshops
  - Collaborate together
2. Exchange of data, collaborate
3. Projects co funded by GMH
  - facilitator <70k\$
  - few large projects

1. Mailing list WG and general list, updates and invites for activities
2. Make sure you start data collection
3. Discuss and develop proposals

# Research and Phenotyping proposal

- Global Methane Hub: budget of \$20-30 million for global genetics program
- Research:
  - Any route possible but preferred through discussion in working groups
- Phenotyping proposals look for:
  - Data in database and public domain
  - Collaborative effort preferred instead of individual actions
  - Can we use multiplier effect?

## Proposals under development (20 May 2024):

Area	#Proposals	Countries/region involved	Target #animals	\$ (when known)
Beef	3 (AUS; USA; Canada)	Aust., NZ, US, UK, Brazil, Ireland; US; Canada	28,000;10,000;?	10m;3m
Sheep	1 (AUS)	Aust., NZ., UK, Uruguay, Ireland	22,000	4.5m
Dairy	5 (J, Hol, Red, Brown, Holstein)	Denmark, NL; Italy ; Denmark, Italy, Canada; Austria, Germany and Switzerland; Poland;	20,000;?;?;?;?;?	0.5m; 0.5m ;1.5m;1.5m;3m
Region	4 (Africa, Latin America, Asia (2), Ethiopia)	4 countries Africa; UY, Arg, MX, BR; India, US; CH, Jap, India,; Ethiopia/NZ	?;14,000;?;?;?; 3000	6m;4.9m;?;?;0.5m
Other	Impact analysis; Microbiome (SP, NL, NZ, AUS, DN, Africa eo); sniffer QA/protocols.			0.12; 2m;0.5m

# Lessons learned

- Lots of interest and activity; very positive response; oversubscribed; most proposals close to what we were looking for. Dimensions:
  - Accelerate activities <-> completely new projects
  - Network building <-> paid research work
  - Yearly data share <-> end of project data share
  - Methane phenotypes <-> proxies
  - Implementation focus <-> science that is needed
  - 70% Leverage funding <-> 30% leverage funding
  - Number of records per dollar for database
- Difficult to align leverage funding across countries
- Need more detailed guidance and criteria from GMG

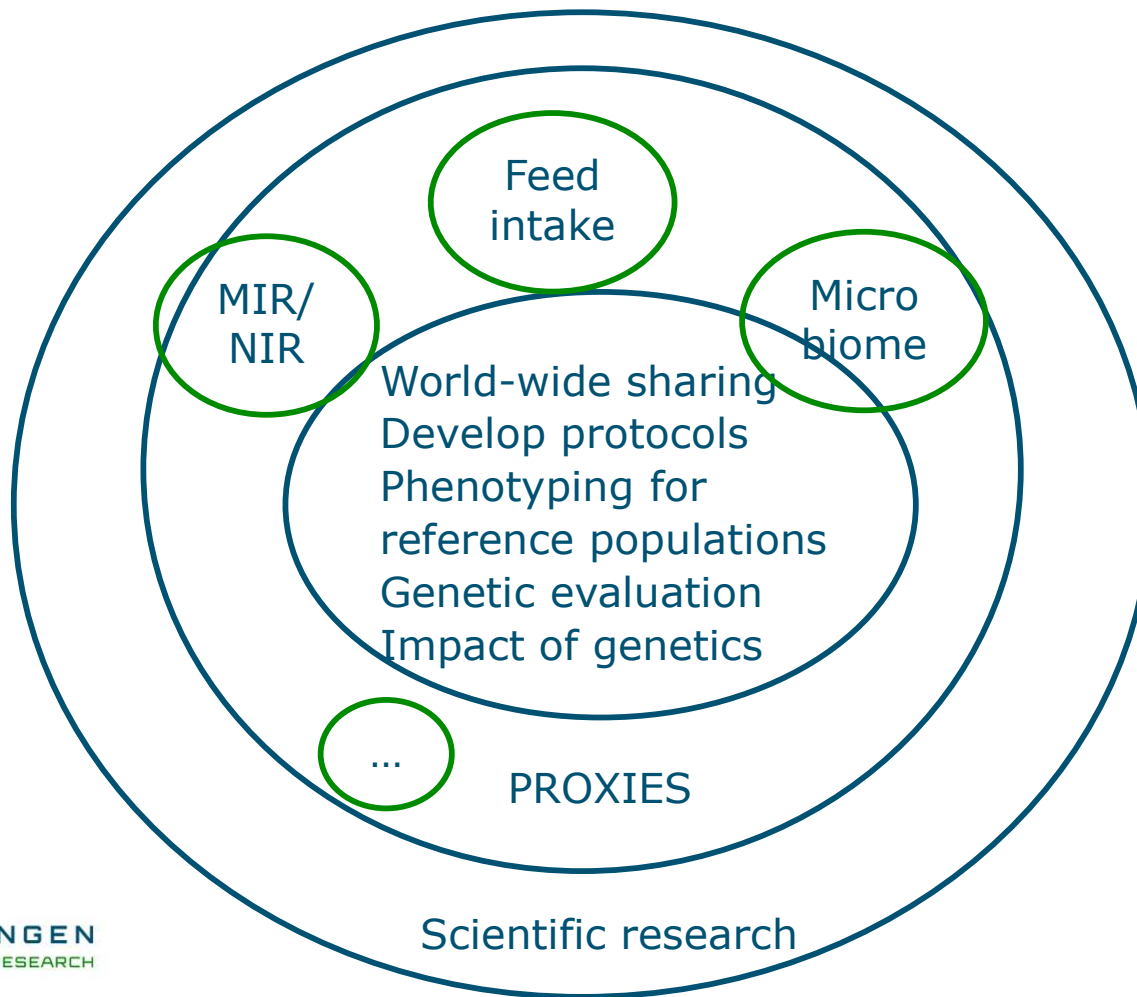
# Important for proposals

- In the centre of the “what, **HOW** and why” of GMG

To support **sharing of protocols** and **data**, to **expand phenotyping, breeding program design** and **genetic evaluations**, underpinning the development of Global Livestock Genetics and Genomics Programs



# Our focus looking at proposals



Invest money in the inner circle

Facilitate networks linking with the two outer circles.

# Important for proposals

- In the centre of the “what, how and why” of GMG
- Take notice of Abacus analysis
- Make data available quickly -> timeframe of GMG
- Work with flexible funding scenarios to lower ambitions (\$):
  - Min needed to succeed project (have to have), allow for more ambition using leverage funding in the future (nice to have)
  - Start small, e.g. initial two-year funding, go-no-go

# Timeline for proposals

- May
  - Feedback verbal in Bled or otherwise
- June
  - Revise, update and write proposal in template, and be sensible based on the presentation today and Abacus study
  - Reduce costs based on suggestions made
- July
  - Select the proposals to be put forward to GMH for funding
- August: admin with GMH (or Wageningen)

# Discussion points

- Value of a record (funding, database contribution)
- Fair share policy database
- Other activities: Webinars, workshops, training courses and focussed WG
- ...

# What is an effective record?

- Problem: Many different types of records
  - Accuracy recording and data handling
  - Sniffer every five seconds, visits, daily, weekly
  - Greenfeed versus sniffer
- Proposed solution to value records, make a pipeline:
  - Data delivered with fixed effects, pedigree and genotypes, plus estimated genetic parameters from data.
  - Estimate EBV and reliability for each animal with records
  - Exclude contribution relatives --> effective record contribution each animal

# Fair share policy database (1)

- Principle: You benefit if you contribute (effective records)
- Data in database
  - Contributed data
  - GMG project data: dairy, beef, sheep
- Anonymised small student data set available for free and everyone

# Fair share policy database (2)

- Discussion points
  - Provide a minimum every year and you get everything (1000 bull genomes)?
  - Get out what you put in 1:1 or 1:2 ?
  - If five parties provide 1 record or together five?
  - Should there be cut off? 1>500; 500>1500; 1500>5000; >5000
  - Differentiate ?
    - > research -> public genetic evaluation -> commercial
- Recognition/acknowledgements data collector

# Webinar, workshop, training course, or ... (1)

- Global Methane Genetics & ICAR Feed&Gas can facilitate:
  - webinars or workshops
  - training courses
  - Small teams spending some time on a subject (task force)
  - Focussed working group
- Develop protocols and guidelines with ICAR Feed&Gas for ICAR Wiki
- Who wants to take the lead/be involved?
  - Projects run by GMG
  - Anyone?



# Webinar, workshop, training course, WG (2)

- Webinar, workshop, course, or focussed working group?
- What focus next year?
  - Microbiome (working group)
  - MIR (working group)
  - SOP and experience greenfeed for free ranging animals
  - SOP and experience sniffers and handling data
  - Trait definition methane EBV
  - Genotyping companies: current options (webinar)
  - Genetic progress in farm- and national credit analysis
  - Webinar for policy makers about impact genetic progress
  - Specific topics for Africa, Asia, South America?