Global Methane Genetics initiative
Sheep Working Group

Global Methane Genetics initiative
Led by WAGENINGEN UNIVERSITY & RESEARCH
In Partnership with BEZOS EARTH FUND, Global Methane Hub

Organisation: Yvette de Haas, Michael Aldridge

November 11, 2025

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Welcome!

- Aim
  - Update what’s happening in Global Methane Genetics
  - Network building
  - Share: knowledge & hurdles
  - Discussion: gaps & needs

Agenda

- Update from GMG (Birgit)
    - data sharing & data base development
- Update ICAR Feed&Gas wikipage (Birgit)
- Update sniffer SOP/testing center for methane recording devices (Yvette)
- Update from the GMG sheep project(s) (Michael)
- Update methane-projects outside GMG (all)
- Open discussion about research gaps (all)
- AOB

Global Methane Genetics initiative

Investment of 27M US$
25 countries, 50 partners, 25 breeds
Methane pheno- & genotypes ~110k cattle & sheep, ~20k microbiome

Dairy:
Holstein (~42k)
Jersey (~8k)
(Nordic) Red Breeds (~7.3k)
Brown Swiss (~3.3k)

Beef:
North America (~6k)
Australia, Ireland, UK, NZ (~18.5k)

Develop protocols
Phenotyping
World-wide sharing
Genetic evaluation

Sheep: world-wide reference population
Australia & New Zealand
UK & Ireland
Uruguay (~17k)

Africa
Local breeds & crosses (~4k)

Latin America
Beef (~7k)

Microbiome:
World-wide reference population (~20k samples)

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Global Methane Hub

Update GMG

- Startup meeting Innsbruck
- Second newsletter [1)].

- Contracts
- Proposal development: small holder farms, Asia & buffalos
- Framework of adoption & incentivization system for genetic selection as methane mitigation tool

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[1)] Sign up: https://www.wur.nl/en/project/global-methane-genetics-initiative.htm

GMG data sharing & data base

- Two data sharing agreements: 1) GMG paid data and 2) exchange for record contribution. Will be sent for signature to partners
- Database
    - Business requirement and review existing database
    - June three offers to build August contracted, weekly meetings, tomorrow consultation meeting

    →planned delivery February

Architecture & Data Flow

User upload Via SharePoint: 1 → 2

User upload Via Web: 7 → 8

Data processing: 3 → 4 → 5 → 6 → 9

Landing DB

- ✓ Storing a copy of imported files
- ✓ Validate & cleanse data

Data Warehouse

- ✓ Centralized methane data store
- ✓ Keeping historical version of data records
- ✓ MiXBLUP integration
- ✓ Contribution score

Data Mart (Contribution Score)

- ✓ Dedicated database for data extraction

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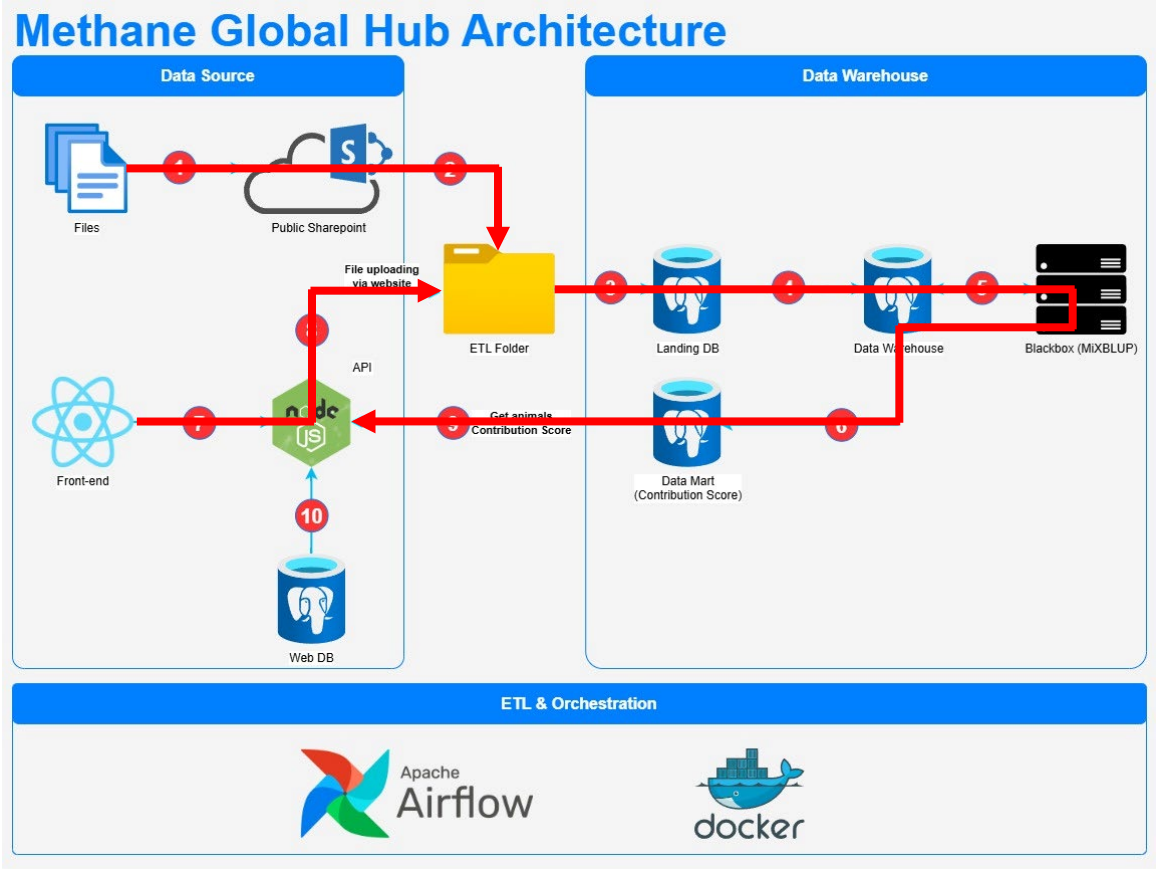

ICAR Feed&Gas wikipage

- https://wiki.icar.org/index.php/Section_20_%E2%80%93_Methane_Emission_for_Genetic_Evaluation
- Portable accumulation chambers (information for sheep)
- GreenFeed – do you have experience with sheep – let us know!
- Wearables
- Microbiome protocols coming soon
- Activities: https://wiki.icar.org/index.php/Section_20:_Activities
- Activities – happy to receive info about projects & events!

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Testing centre for methane recording devices
Standard Operating Procedures (SOP) - Sniffers

Yvette de Haas, Chantal van Gemert, Lisa Büttgen

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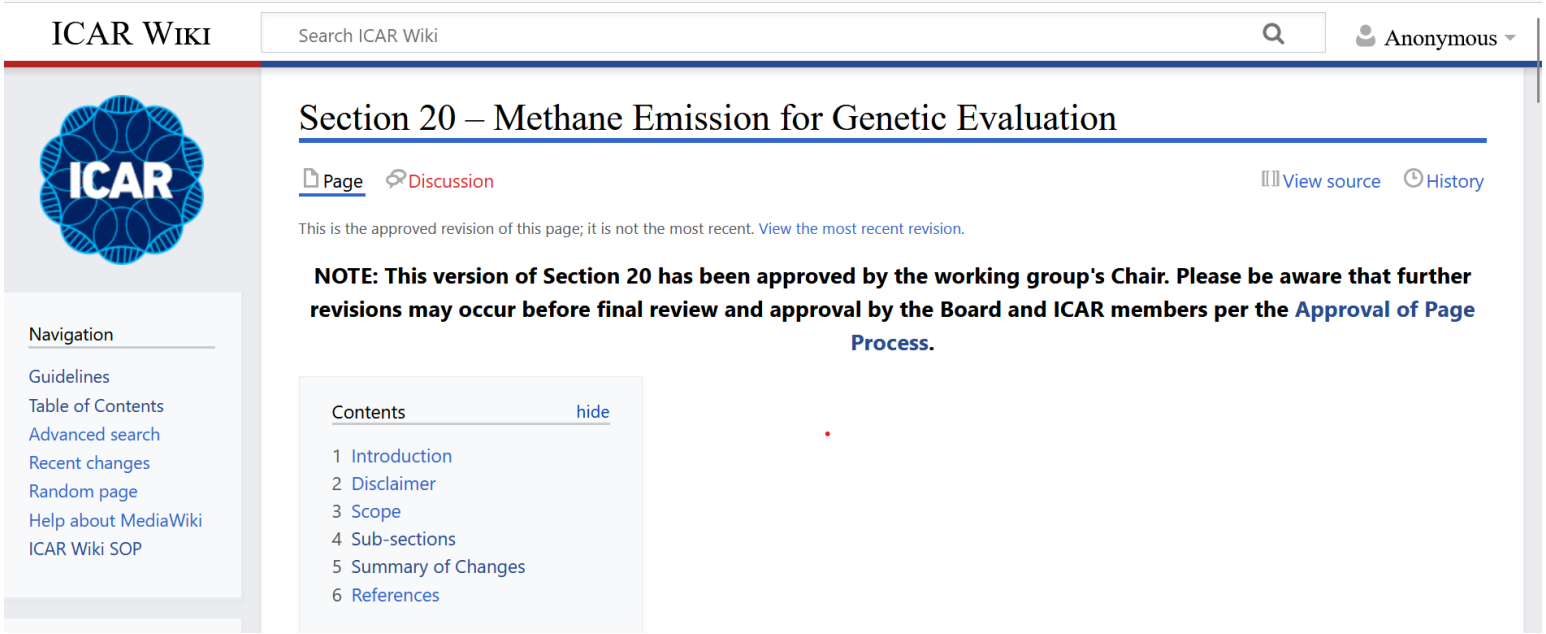
Specifications on ICAR Wiki

ICAR Wiki: https://wiki.icar.org/index.php/Guidelines



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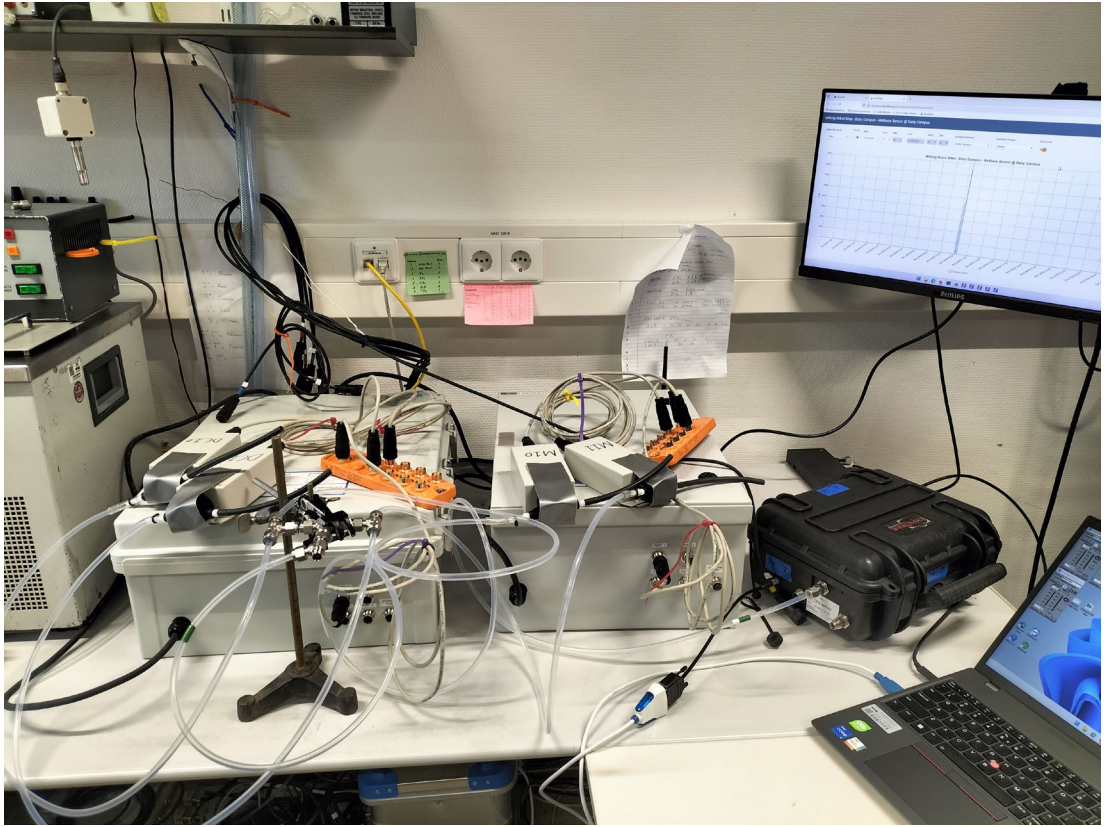
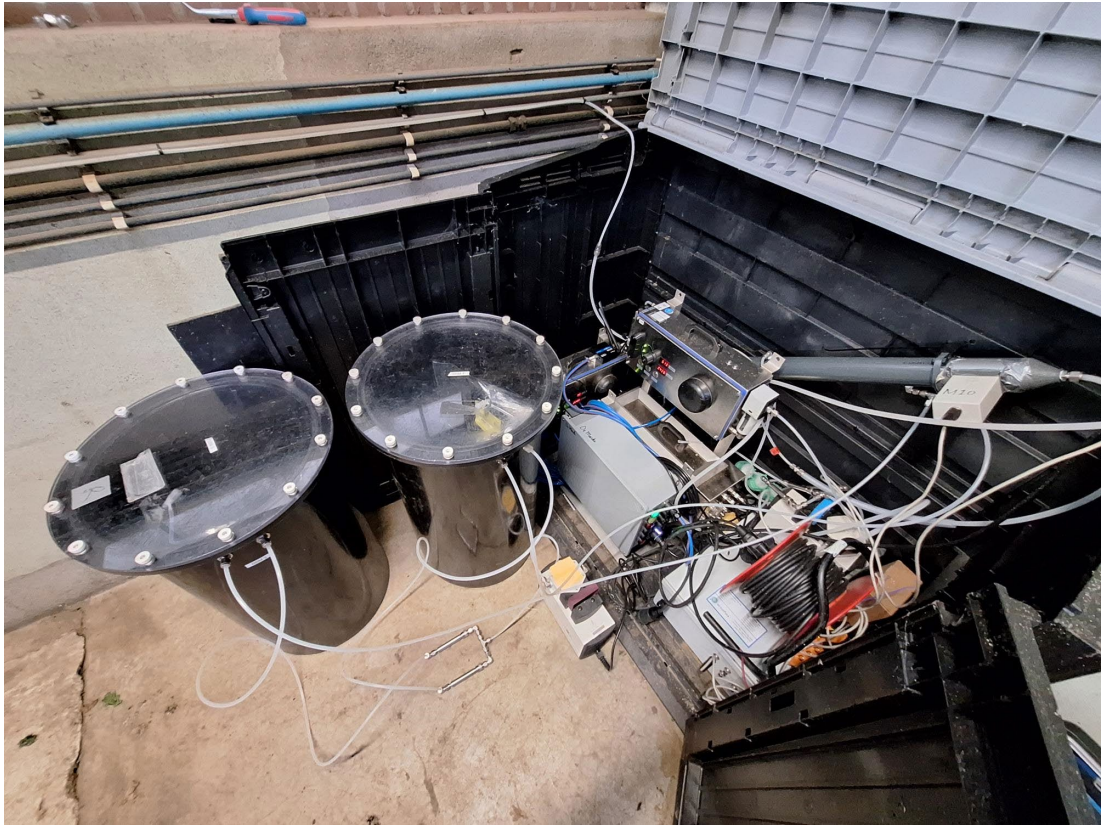
Set up lab facility



Set up on farm facility

Set up lung method (= Gold Standard)



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https://edepot.wur.nl/536449

ICAR test facility

- First for sniffers
- Later maybe also for other methane devices?
- ICAR Board meeting early last week

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ICAR Validated Sensor Systems

Beyond official milk recording, obtained with ICAR certified devices, results from devices also supports farm management by providing insights into production, animal health, welfare, and sustainability, often enhanced by mathematical models and algorithms. Given the diversity of applications, a single evaluation protocol is impractical; instead, ICAR offers claim validation for solutions outside official milk recording to ensure user trust while allowing flexibility in development.

ICAR validation ensures that a device (e.g. milk meters for cows and sheep/goats, automatic milking system (AMS) device, milk analysis device, on farm at/in line milk analyzer, sensor device) meets manufacture performance claims through ICAR-approved test plans conducted by a qualified ICAR Test Center.

Successful validation confirms that the system can reliably deliver quality data when used correctly, leading to the award of an **ICAR Certificate of Validation**.

Apply now

Submit the application form to request a validation now.

Application form

The application form should be accompanied by the requested documentation:

- Clear description of all components of system – ID, components, software, etc.
- System technical manual
- Farm operator manual
- Internal research and validation studies
- Peer reviewed publications
- Software manual for use of the system devices
- Installation procedure
- Routine test or periodic checking procedures for service technicians
- Technical characteristics, drawings and 2D/3D pictures of the device

Validation procedure

1. The applicant submits an application form
2. The application is reviewed, and the Test Centre is designated.
3. The Test Centre prepares the test plan, detailing the timeline and associated costs.
4. ICAR provides the applicant with an umbrella contract and invoice for test fees, along with the test plan.
5. Testing begins upon signing of the contract by the applicant and full payment of the test fees.
6. Upon test completion, ICAR disseminates the report to the MRSD Sub-Committee for review, comments, and recommendations.
7. ICAR forwards the report to the applicant and issues the official ICAR Certificate upon successful completion of the test.
8. The certified device/system is listed on the ICAR website.

Update GMG Sheep project(s)

- Michael Aldridge

Update on GMG sheep project: CleanBreeding

D.J. Brown, . M.N. Aldridge,

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agbu 50 years powering genetic improvement

Key outcomes

- Collation of historical data into a combined dataset
- A minimum of 16,000 new phenotypes for methane on genotyped animals
    - Feed intake traits and microbiome through collaboration
- Accurate breeding values and indexes for all countries
- New proxy measures of methane and possibly feed intake to deploy to use as selection criteria
- Development of training and knowledge transfer programs and resources

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Recording aims

Project Lead: Daniel Brown

Program Leaders:

- Australia — Dr Micheal Aldridge
- Uruguay — Dr Gabriel Ciappesoni
- New Zealand — Dr Suzanne Rowe
- United Kingdom — Dr Nicola Lambe
- Ireland — Dr Noirin McHugh

Country	Breed Type	Y1	Y 2	Y3	Y4	Total
Australia	Merino		2,000	2,000		4,000
	Maternal		1,000	1,000		2,000
	Terminal		700	700		1,400
Uruguay	Merino	170	320	320	100	910
	Texel	100	200	200	100	600
	Dohne	100	200	200	100	600
	Corriedale	130	280	280	200	890
New Zealand	Merino	100	500	500	100	1,200
	Maternal Comp	200	500	500	200	1,400
	Texel	200	500	500	200	1,400
United Kingdom	Maternal					0
	Terminal	300	300	300	300	1,200
Ireland	Maternal Comp		250	250		500
	Terminal Comp		250	250		500
total		**1,300**	**7,000**	**7,000**	**1,300**	**16,600**

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Contracting and IP prinicples

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Operational plan

- Project structure and programs within countries
- Reference population to drive international genetic improvement for CH_4 and FI
- 16,000 new methane phenotypes and genotypes
- Align trait recording protocols and guidelines
- Breeding program development
- Include the data in the international database
- Accurate breeding values and indexes for CH_4
- Development of training and knowledge transfer programmes and resources

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Animal ethics approval and expressions of interest

- Each country requires their own ethics approval
- Amendments or new submissions have been made
- For industry animals, breeders are being approached or requested to submit EOIs

Coming 6 months

- Each country already has capacity to start measuring
- New PACs are being constructed or ordered
- Unclear what to replace aging Eagle-2 devices with
- Phenotyping and genotyping of new animals
  - Planned for 2026: Australia (3,700), Uruguay (1,000), New Zealand (1,500), UK (300), Ireland (500). Total of 7,000 of the 16,000 to be measured in the project.

What else should we do to accelerate progress? i.e. research gaps

- Trait definition – ratio trait? Which trait in the breeding goal? Challenge inclusion methane in breeding goals
- GxE feed additives
- Beef on dairy
- Genetic correlation between methane & feed intake/efficiency
- Measuring methane in young (heifer) animals
- Software QC, data editing

Open discussion – research & knowledge gaps

- ...

Thanks for your attention & contributions!

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Newsletter:

https://www.wur.nl/en/project/global-methane-genetics-initiative.htm?wmstepid=thank_you