Global Methane Genetics initiative

Africa Working Group

Organisation: Yvette de Haas, Raphael Mrode

November 7, 2025

WAGENINGEN
UNIVERSITY & RESEARCH

Welcome!

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

Agenda

- Update from GMG (Roel)
    - data sharing & data base development
- Update ICAR Feed&Gas wikipage (Chantal)
- Update sniffer SOP/testing center for methane recording devices (Yvette)
- Update from the GMG Africa project(s) (Raphael)
- 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)

WAGENINGEN UNIVERSITY & RESEARCH

BEZOS EARTH FUND

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

WAGENINGEN
UNIVERSITY & RESEARCH

[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

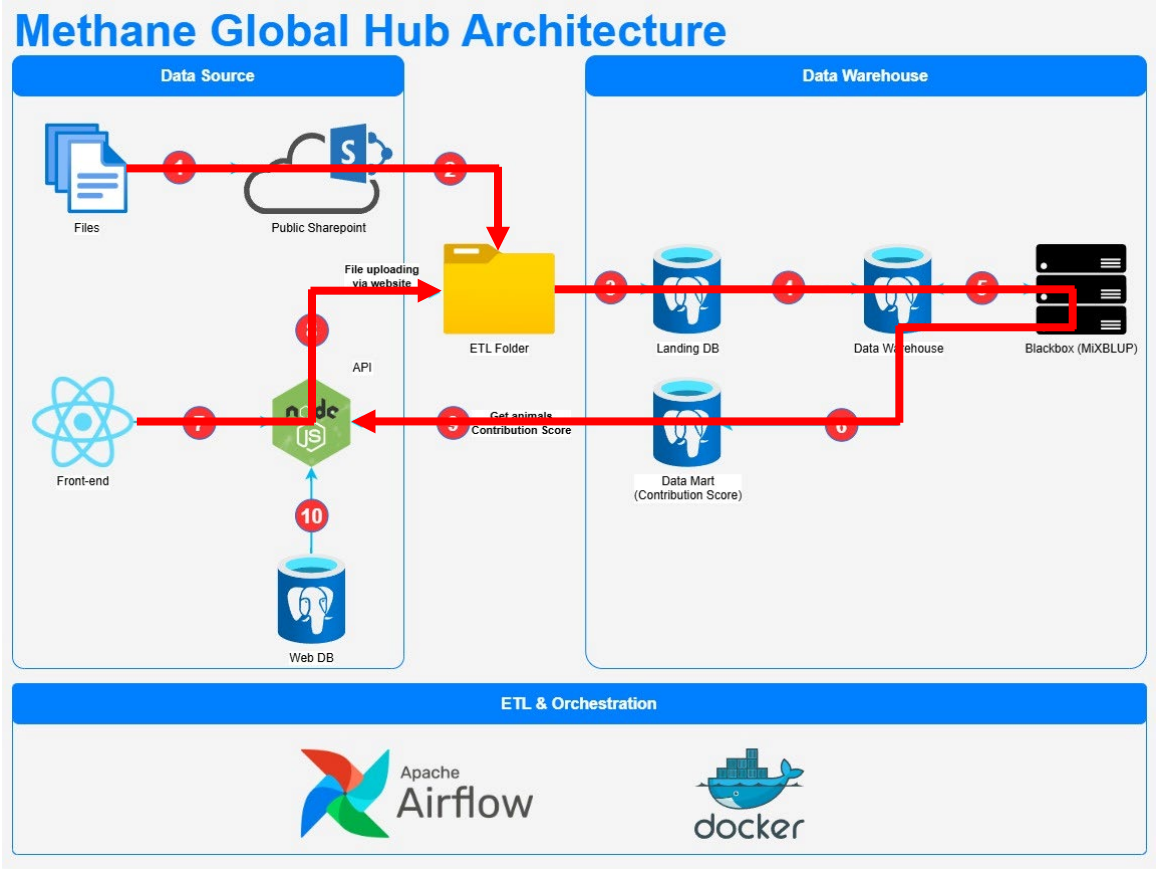
Data Warehouse

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

Data Mart (Contribution Score)

- ✓ Dedicated database for data extraction

WAGENINGEN UNIVERSITY & RESEARCH



ICAR Feed&Gas wikipage

- https://wiki.icar.org/index.php/Section_20_%E2%80%93_Methane_Emission_for_Genetic_Evaluation
- GreenFeed
- Wearables
- Microbiome protocols coming soon
- Activities: https://wiki.icar.org/index.php/Section_20:_Activities
- Activities – send us information about projects & events to be included here!

WAGENINGEN
UNIVERSITY & RESEARCH

Global Methane Genetics initiative
Testing centre for methane recording devices
Standard Operating Procedures (SOP) - Sniffers

Yvette de Haas, Chantal van Gemert, Lisa Büttgen

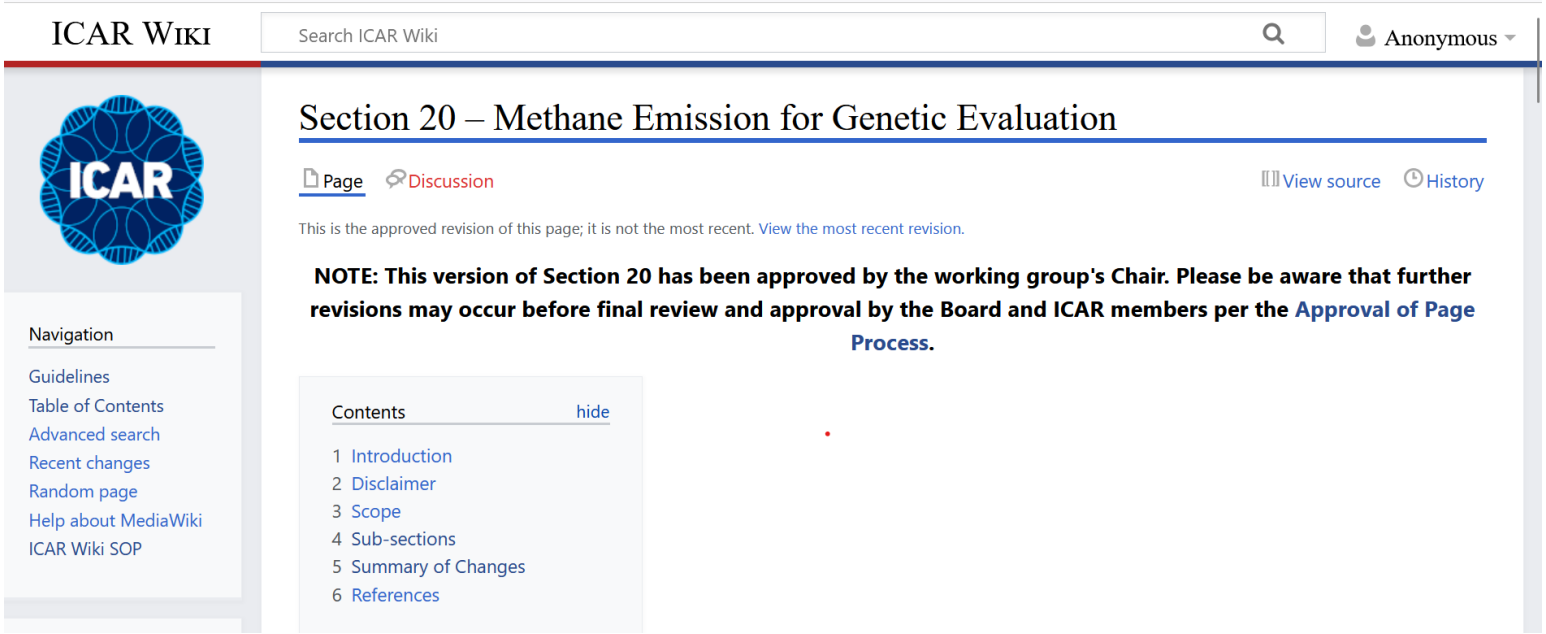
WAGENINGEN
UNIVERSITY & RESEARCH

BEZOS EARTH FUND

Global Methane Hub

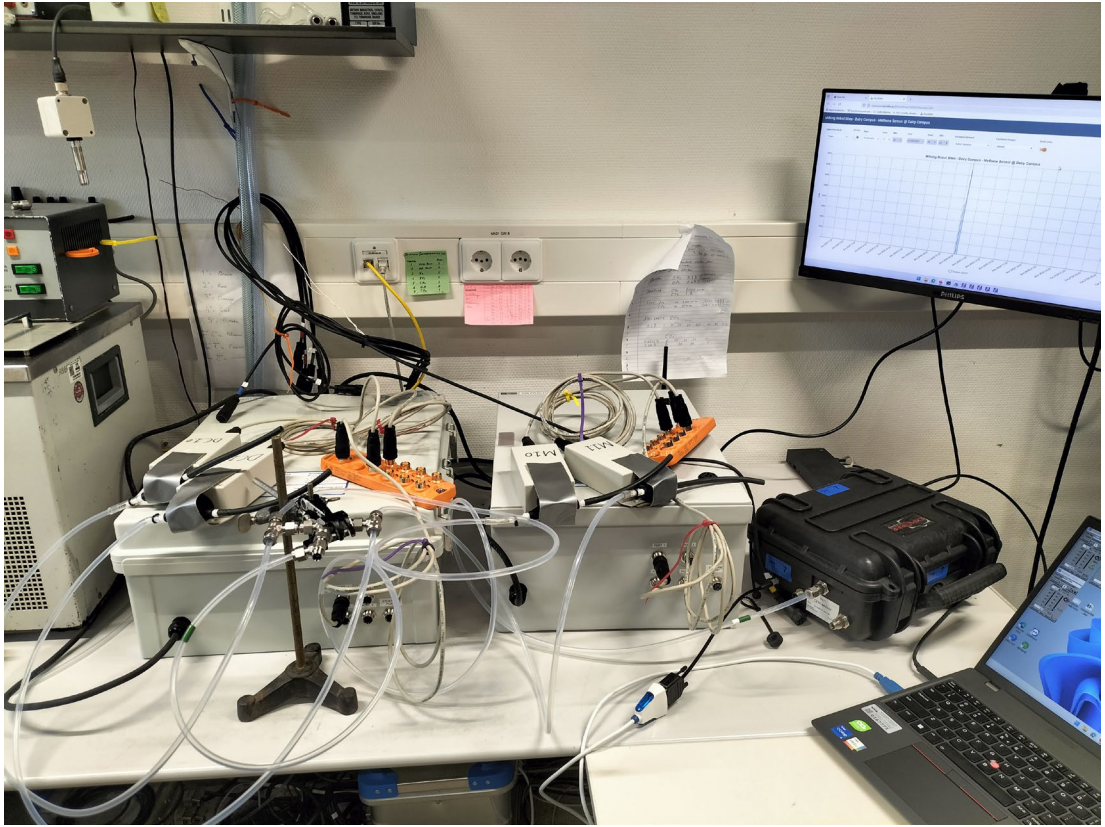
Specifications on ICAR Wiki

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



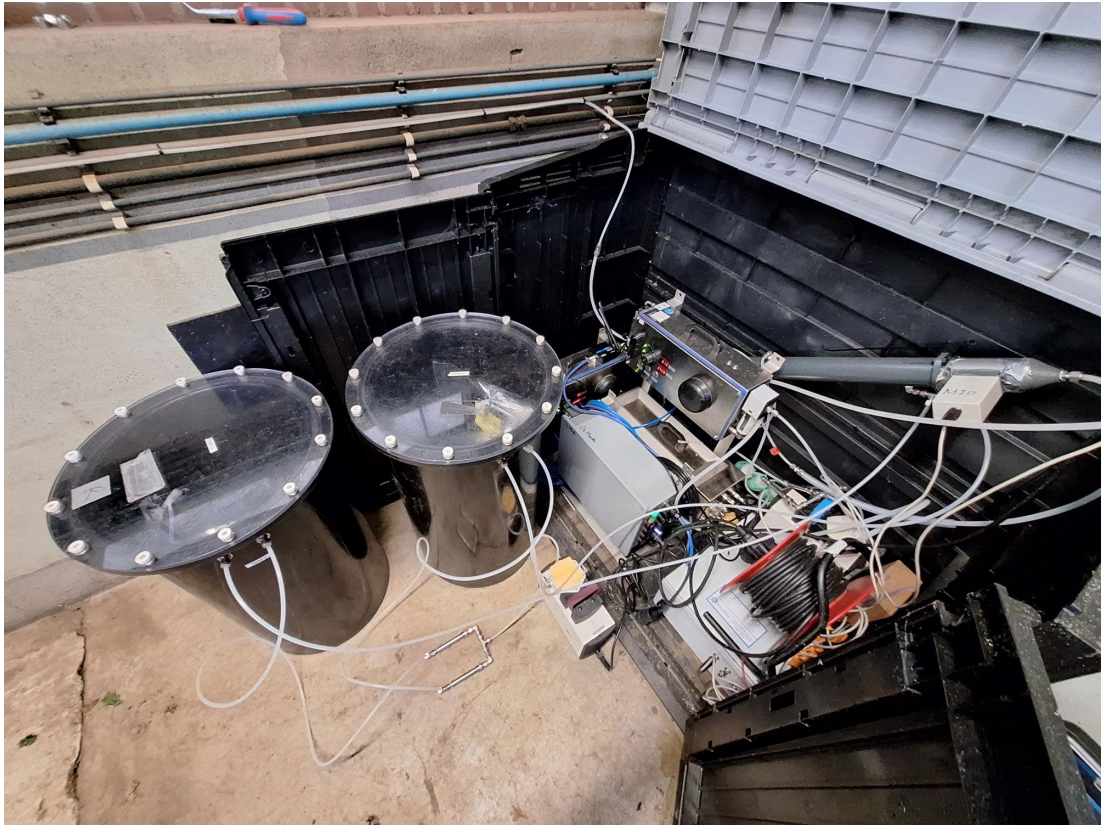
WAGENINGEN
UNIVERSITY & RESEARCH

Set up lab facility



Set up on farm facility

Set up lung method (= Gold Standard)



WAGENINGEN
UNIVERSITY & RESEARCH

https://edepot.wur.nl/536449

ICAR test facility

- First for sniffers
- Later maybe also for other methane devices?
- ICAR Board meeting earlier this week

WAGENINGEN
UNIVERSITY & RESEARCH

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 Africa project(s)

- Raphael Rmode
- Richard Crooijmans
- Joram Mwacharo

Global Methane Genetics Initiative: Accelerating reduced emissions in indigenous breeds in Africa

R. Mrode -- East Africa Team : ILRI, Nairobi, Kenya
West Africa Team:Habibou ASSOUMA (CIRAD) and Luc Hippolyte Dossa (UAC)
South Africa Team: Giel Scholtz (ARC)

ILRI
INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE
CGIAR

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

Update on Status- General

- CRA with West Africa and ARC South Africa finalized and signed

East Africa component

- ILRI Ethical approval -- IREC approved and IACUC in progress
- Project launched in Kenya on the 10th of September and 17th in Ethiopia
- Green Feed Unit now delivered, and installation planned by 2nd of December
- 6 Methane Laser detector delivered

Update on Status

- Projects sites identified in both countries
- Technicians employed in both countries
- Training of Technicians will commence next week, and data collection anticipated for last week of November
- Post doc hired
- ICT team has sent up database to handle data

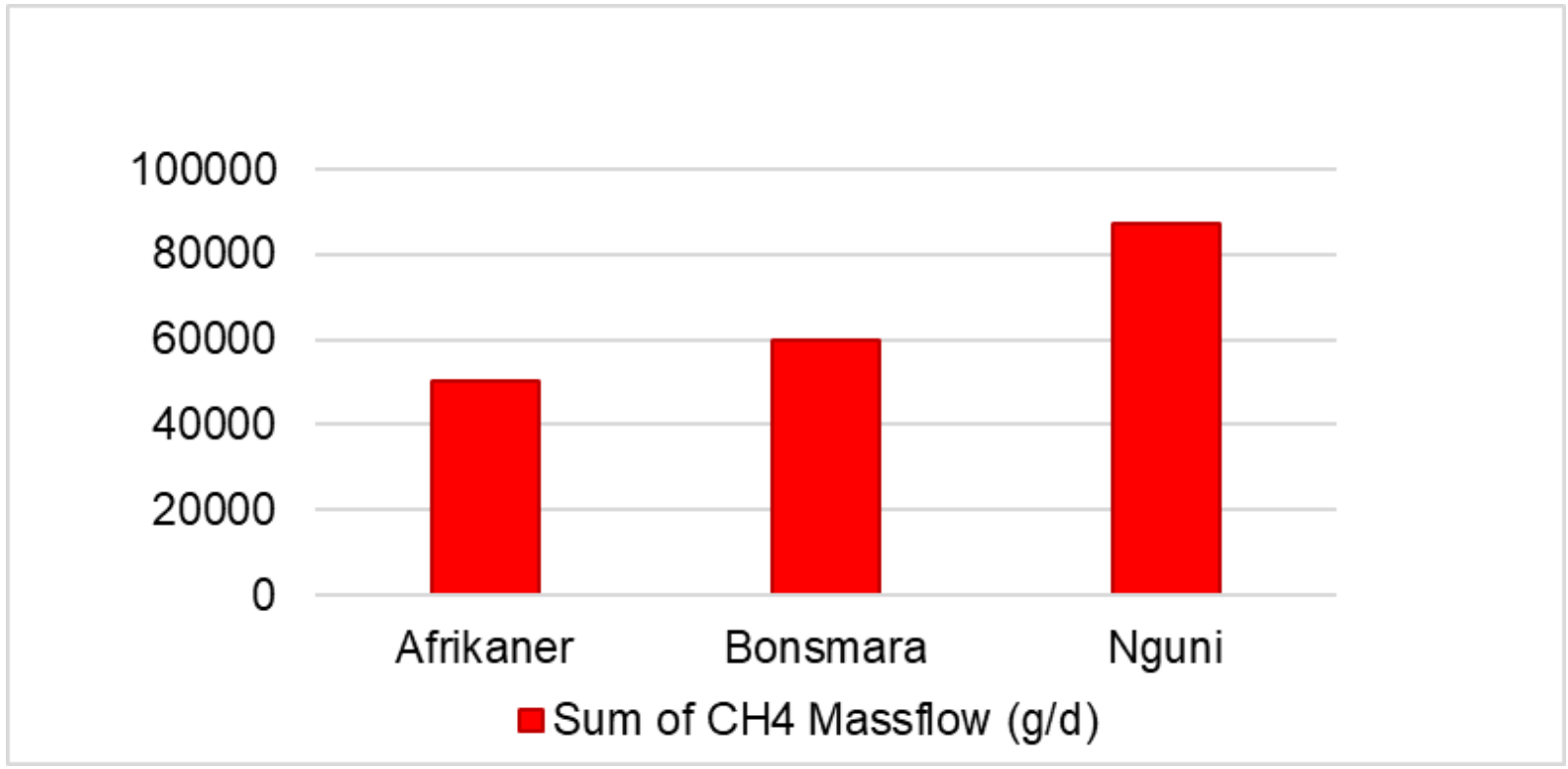
- Microbiome sampling

ARC, South Africa

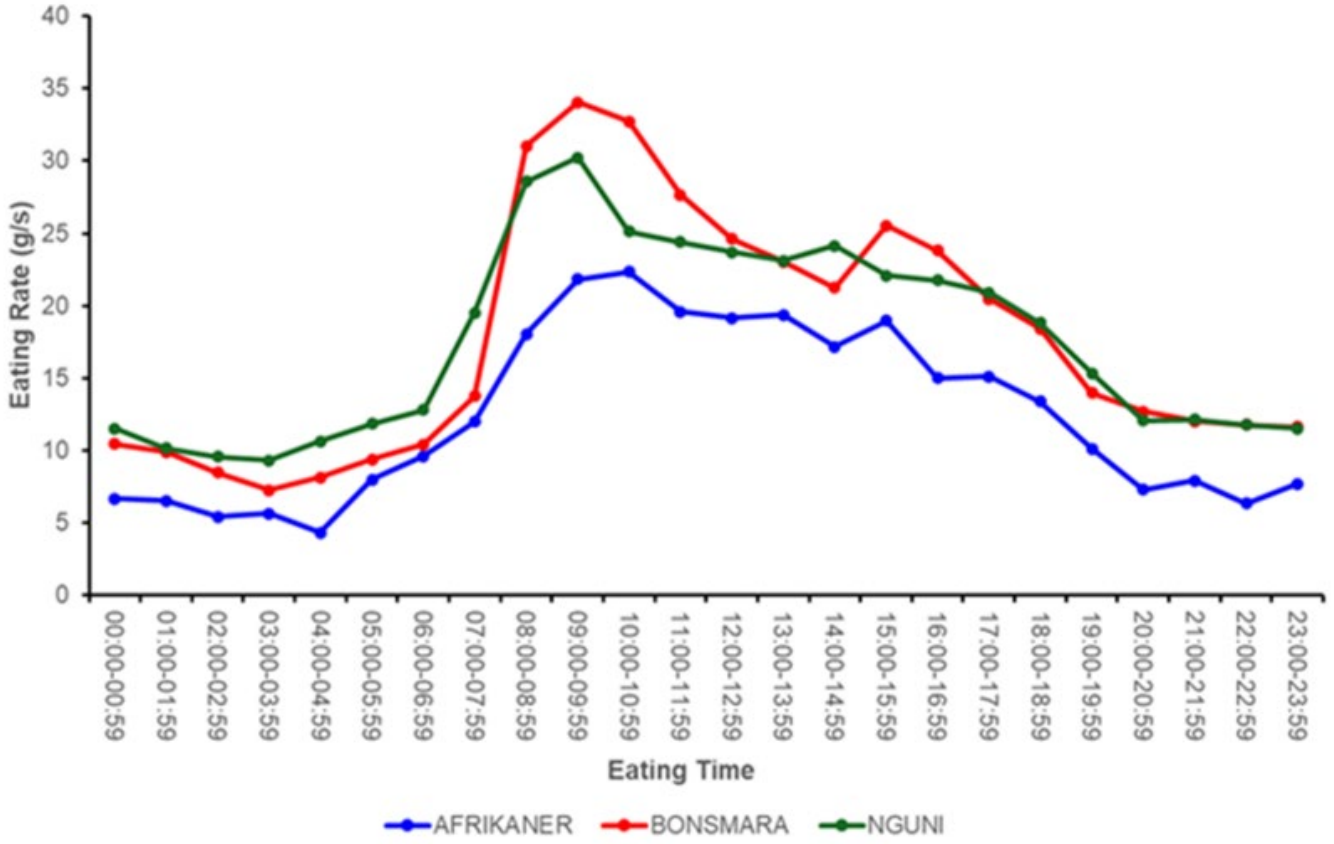
- Total of 20 young bulls each from the Afrikaner, Bonsmara and Nguni indigenous breeds acquired for the first round of testing
- The bulls were tested in a GrowSafe system, with a GreenFeed system in the same pen to measure methane emissions.
- Information includes real time feed intake and partial body weight, as well as methane measurements using the GreenFeed system.
- Hair, rumen fluid and manure samples have been collected, but no analyses have been done at this stage.

Some photos

Methane production over a period of four months



Intake rate (in grams / second) of the different breeds



ILRI
INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE
CGIAR

Selection index – simulation study

- Selection index that includes methane emissions for beef cattle

- To predicts net return to land and management from weaner calf production under size rescaling with energy consumption by cows being a function of metabolic body weight and milk production.

UPDATE ON PROGRESS

West Africa (UAC, Benin & CIRDES, Burkina Faso)

5 November 2025

Global Methane Genetics initiative

Led by WAGENINGEN UNIVERSITY & RESEARCH

In Partnership with BEZOS EARTH FUND, Global Methane Hub

Activities carried out

August 2025

- Hybrid kick-off meeting of the GMG initiative
- Fodder production established on two sites (Benin, Burkina Faso) for animal feeding

Activities carried out

September 2025

- Approval of the stable construction plan
- Equipments' purchasing for data collection

Pelleter for GreenFeed® bait manufacturing

Laser Methane Scanner for methane measurement

LactoScan for milk analysis

Scale for animal weighing

Activities carried out

September 2025

- Call for applications for the recruitment of a PhD student

October 2025

- Recruitment of two postdoctoral fellows
- Shortlisting of PhD candidates

November 2025

- Interview and recruitment of a PhD student

Upcoming activities

November 2025– Mid January 2026

- Construction of the experimental stable (Benin)
- Installation of GreenFeed® and Smart Feed Systems (Benin)

Upcoming activities

End January 2026

- Project launch in Benin

February - March 2026

- Purchase of animals of the identified breeds
- Beginning of data collection

Thank you for your attention

Global Methane Genetics initiative

Led by

WAGENINGEN UNIVERSITY & RESEARCH

In Partnership with

BEZOS EARTH FUND

Global Methane Hub

ILRI INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

CGIAR

better lives through livestock

ilri.org

What’s happening in Africa – other projects/initiatives

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 gaps

- ...

Thanks for your attention & contributions!

Global Methane Genetics initiative

Led by WAGENINGEN UNIVERSITY & RESEARCH

In Partnership with BEZOS EARTH FUND, Global Methane Hub

gmg@wur.nl

Newsletter:

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