Global Methane Genetics initiative
Latin America Working Group

Organisation: Yvette de Haas, Elly Navajas

November 14, 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 (Chantal)
- Update sniffer SOP/testing center for methane recording devices (Yvette)
- Update from the GMG LATAM project(s) (Elly)
- Update methane-projects outside GMG (all)
- Open discussion about research gaps (all)
- AOB

Global **M**ethane **G**enetics 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, North America (~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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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

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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

    →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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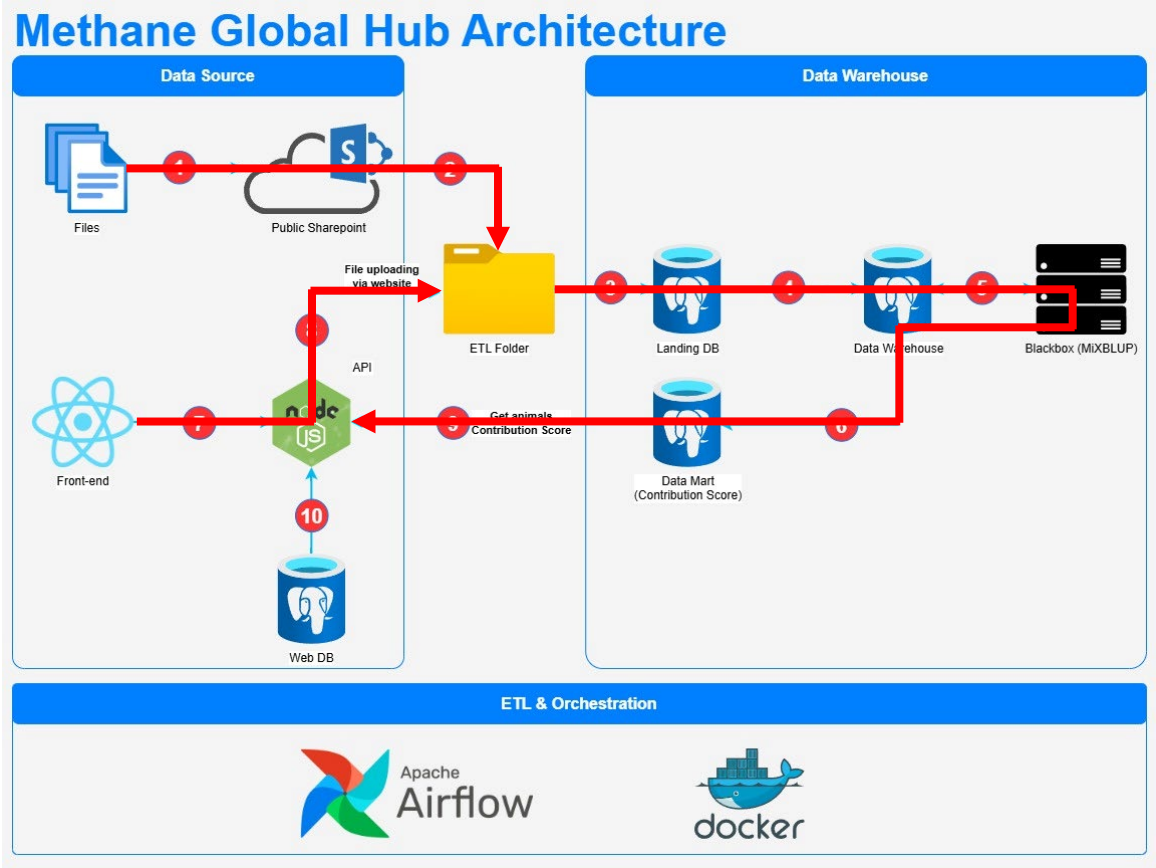

ICAR Feed&Gas wikipage

- https://wiki.icar.org/index.php/Section_20_%E2%80%93_Methane_Emission_for_Genetic_Evaluation
- 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!

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

Yvette de Haas, Chantal van Gemert, Lisa Büttgen

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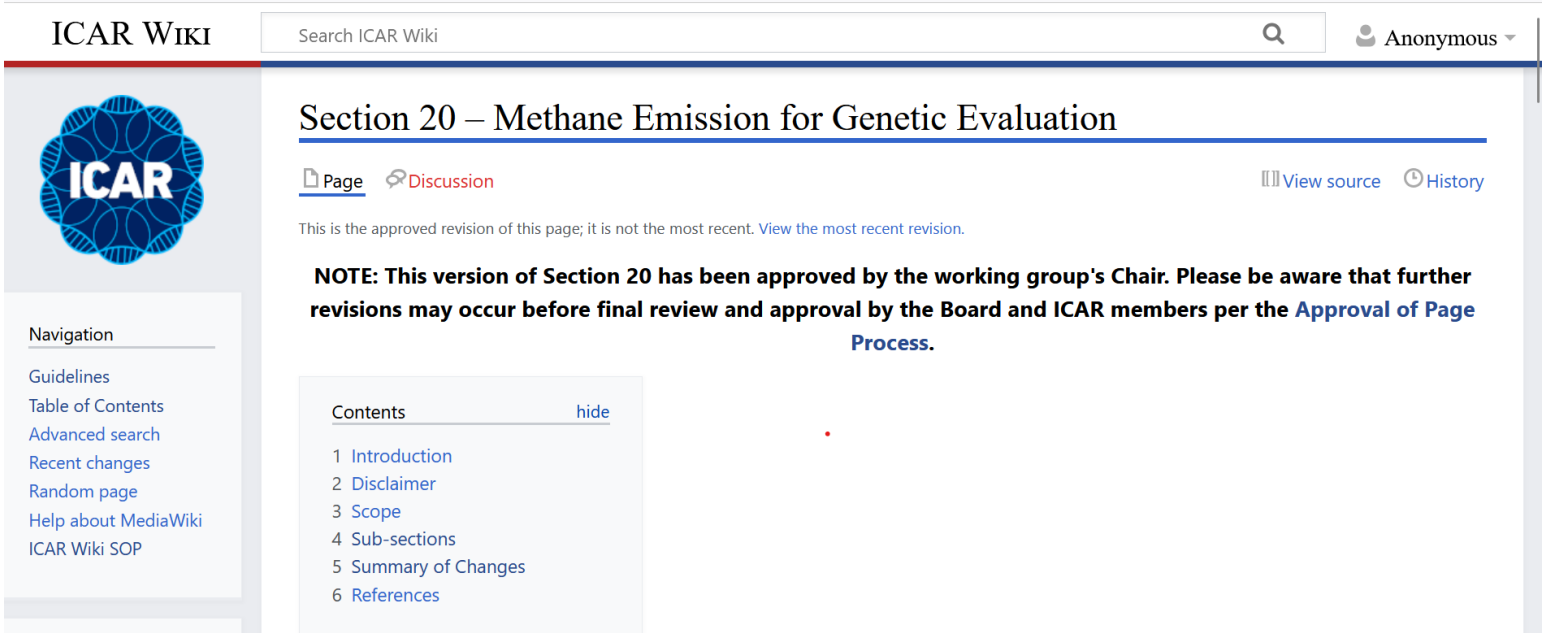
Specifications on ICAR Wiki

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



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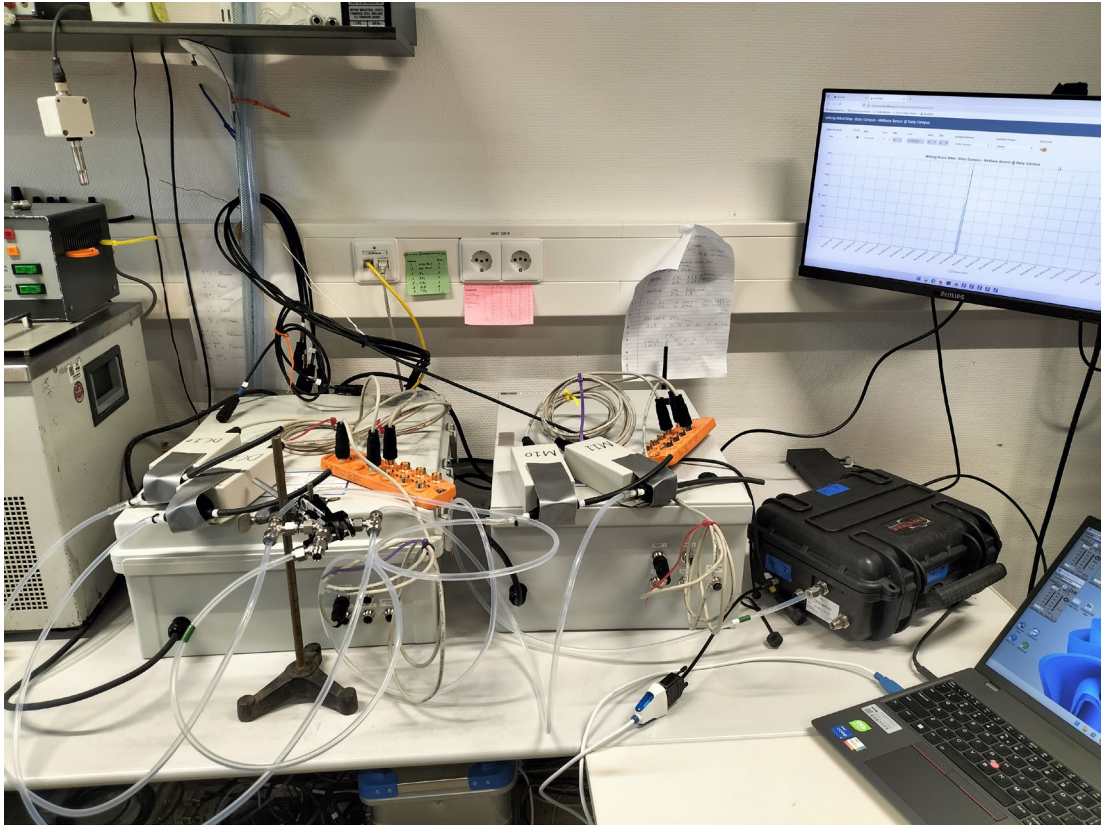
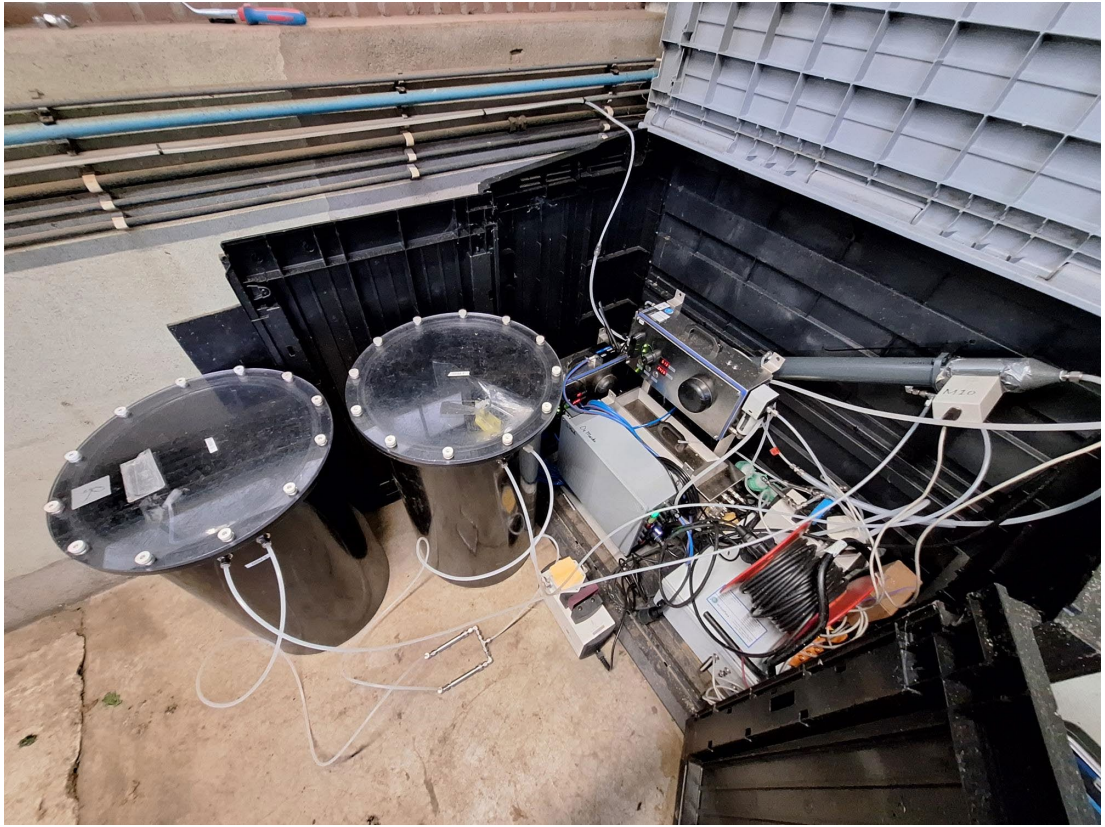
Set up lab facility



Set up on farm facility

Set up lung method (= Gold Standard)



https://edepot.wur.nl/536449

ICAR test facility

- First for sniffers
- Later maybe also for other methane devices?
- ICAR Board meeting earlier this 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 LATAM project(s)

- Elly Navajas / Gabriel Ciappesoni

UPDATE

Livestock breeding strategies for enteric methane mitigation in developing countries – the case of Latin America

Vicente Vega-Murillo
René Calderón-Chagoya
Moises Montaño-Bermúdez

Alexandre Berndt
Fernando Cardoso

Gabriel Ciappesoni
Elly Navajas

Mauricio Alvarez
Sebastian Munilla

- **The goal is to accelerate genetic progress in reducing methane emissions and achieving greenhouse gas mitigation targets, without affecting productivity**

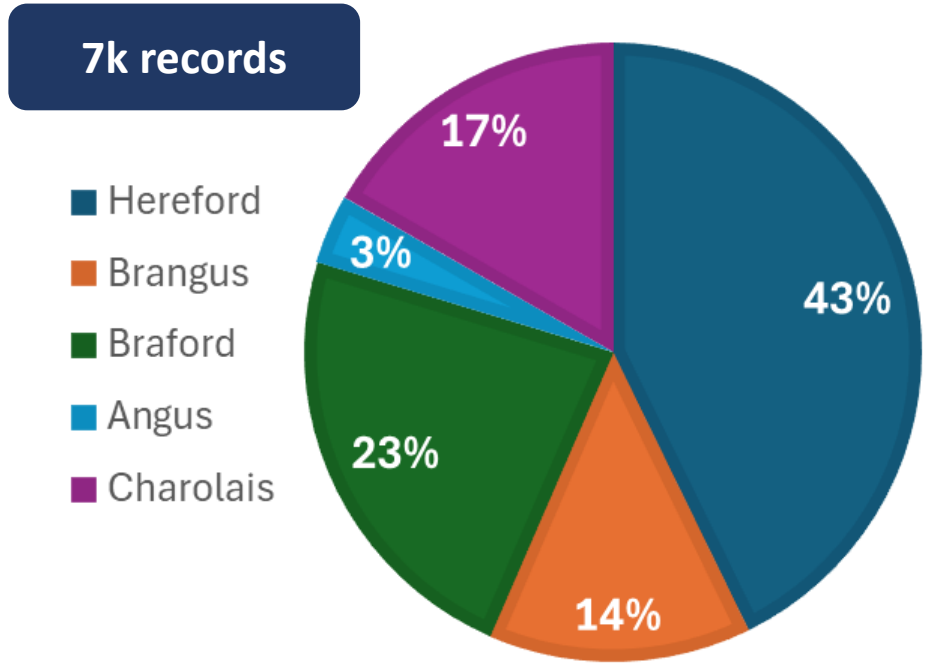
- **Implementing genomic selection in beef cattle to reduce methane emissions by 2030**
- **By building initial reference populations**
- **Establishing the basis for regional expansion**

Global Methane Hub

Main Focus Areas and Objectives

- **Initial reference population (phenotyping platform)**
  - Methane phenotypes and genomic data
  - Animals with additional relevant information
  - Genetic evaluation (or linked to)

- **Genetic analysis and breeding programs**
  - Estimation of genetic parameters, including genetic correlations with production, feed intake & feed efficiency
  - Estimation of genomic breeding values based on pure-breed and multi-breed reference populations
  - Evaluation impact of selection for lower methane emission



- **Knowledge transfer and communication strategies**
  - Communication strategies for relevant stakeholders (academia, breeders/farmers, policy makers)
  - Links with technical teams responsible for GHG inventories and NDCs
  - Connections and integration with other countries in the region

Progress and challenges

Contract and data agreements

- Methane phenotypes, genomic data and pedigree information
- Approval by breeders

Nellore breed included

- Agreement between EMBRAPA and the Associação Brasileira dos Criadores de Zebu

New equipment arrival and calibration

Internal Research Cooperation Group on Methane Measurement

- to promote the exchange of technical experience, harmonization of methodologies, and “real-time” mutual support in addressing daily operational issues

Communication to different stakeholders

Additional funding to strengthen institutional and technical capacities

Argentina

Instituto Nacional de Tecnología Agropecuaria Argentina

Fundación ARGENINTA

FAUBA

Establishment and Upgrade of Experimental Units

Four beef cattle phenotyping centers equipped and operational: INTA Cesáreo Naredo, INTA Mercedes, INTA Anguil, and INTA Balcarce. Three of them already have methane-measurement infrastructure; remaining equipment will be completed with project funds.

Argentina

Instituto Nacional de Tecnología Agropecuaria Argentina

- **Commissioning and Calibration of Measurement Systems**

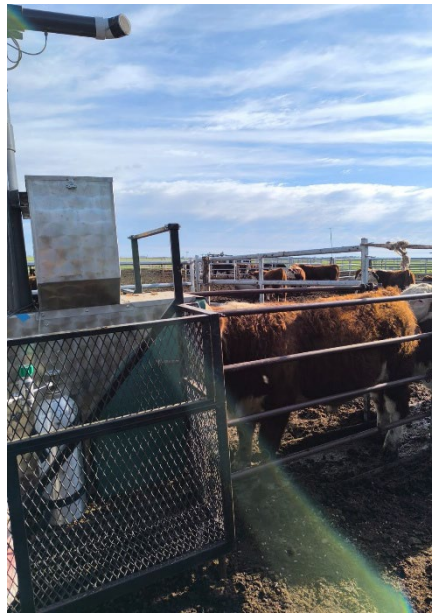
INTA's GreenFeed units were fully calibrated and validated. Professional staff received targeted training, and initial commissioning trials were conducted to ensure measurement robustness.

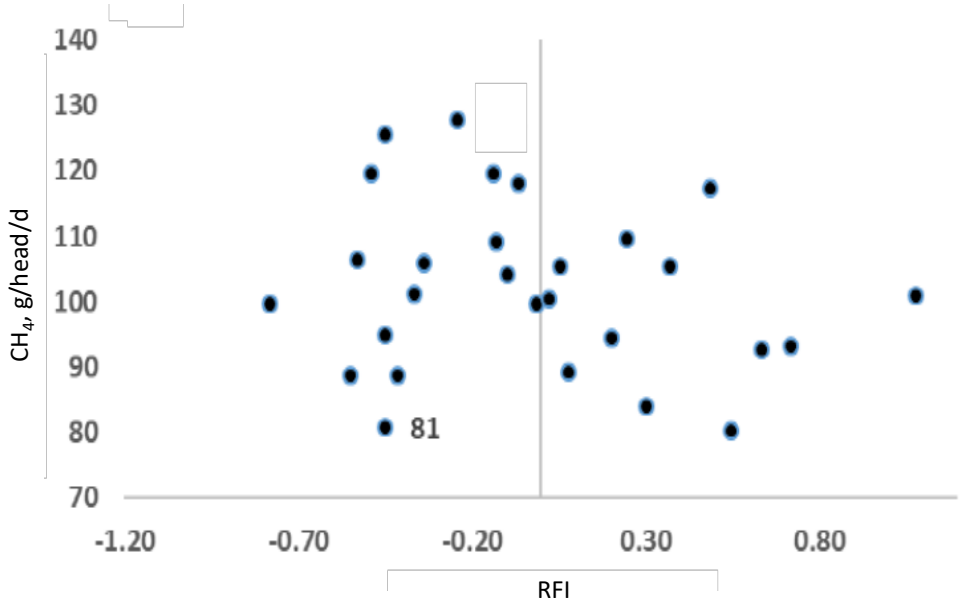
- **Initiation of Methane Phenotyping Activities**

Methane phenotyping started in the Hereford breed. To date, **64 animals** have been measured, all with associated **Residual Feed Intake (RFI)** records.

- **Development of a National Methane Phenotype Database**

Work has begun on an internal centralized database to harmonize and curate methane-related phenotypes, supporting future data sharing within the project.





Argentina

Instituto Nacional de Tecnología Agropecuaria Argentina

Engagement with the Private Sector – Key Achievements

•Formal Agreements with Breed Associations

Formal collaboration agreements were established with the technical boards of the **Braford**, **Brangus**, and **Hereford Argentina** breed associations.

The project was also presented to the **Angus Argentina** association; its participation is currently under review by the board of directors.

•Engagement with Private Companies

Biofarma, the private center that phenotypes the largest number of animals for **Residual Feed Intake (RFI)** in Argentina, has expressed strong interest in joining the project as an additional methane-measurement site.

Work is currently underway to formalize an agreement, which would include installing one of the new methane-measurement units funded by the project and providing specific training to Biofarma's professional staff.

Argentina

Instituto Nacional de Tecnología Agropecuaria Argentina

Team – Roles and Responsibilities

National Focal Points

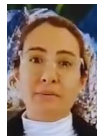
•Mauricio Álvarez, PhD (INTA)alvarez.juan@inta.gob.ar
National Focal for INTA Point for Argentina. Coord Meat & Animal Fibers

•Sebastián Munilla, PhD (FAUBA)
munilla@agro.edu.ar
National Focal Point for FAUBA,.

Roles: Overall coordination of the country's participation in the project. Leadership and integration the national research teams, ensuring technical alignment across institutions, oversee data and methodological consistency, and support the effective implementation of project activities in line with national objectives.

Methane & Microbiota Research Team – INTA

•Patricia Ricci, PhD – Research Team Leader (Methane)



•Gabriela Hug, MSc – Researcher (Methane)

•Jorgelina Flores, MSc – Researcher (Methane)

•José Arroquy, PhD – Researcher (Methane)

•María Coria, MSc – Researcher (Methane)

•Gabriela Volpi, PhD – Researcher (Methane)

•María Cerón Cuchi, PhD – Researcher (Microbiota)

Genetics Research Team – FAUBA

•Andrés Rogberd, PhD – Researcher (Genetics)

•Matías Krause, PhD candidate – **Researcher (Genetics)**

•Belcy Angarita, PhD candidate – Researcher (Genetics)

Roles: Coordinated methane phenotyping, microbial and metabolic characterization, genetic and genomic analyses, development of data pipelines to integrate traits. Operation and calibration of measurement platforms, data quality and harmonization, methodological refinement, scientific evidence

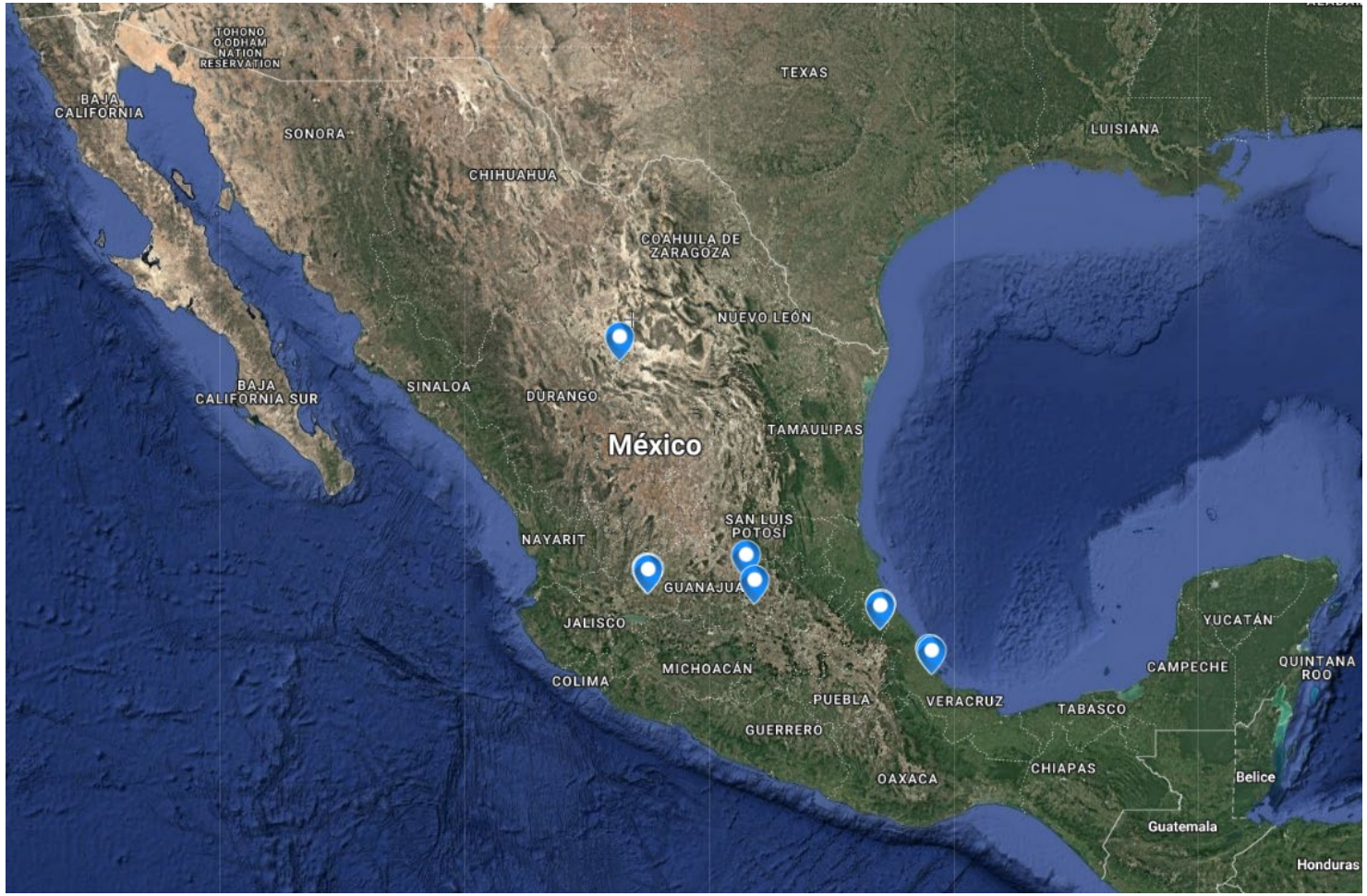
México

In Mexico, enteric methane measurements have been carried out mainly on dairy cattle in different states with the aim of generating baseline information on emissions in different production systems.

To date, measurements have been taken at production units in:

- Coahuila (37 animals, 1 dairy barn)
- Jalisco (104 animals, 4 barns)
- Puebla (131 animals, 3 barns)
- Veracruz (49 animals, 2 barns)
- Querétaro (79 animals, 1 barn)
- Guanajuato (234 animals, 1 barn)

The studies were carried out with the support of three collaborative projects involving INIFAP, local producers, and private institutions.



These evaluations were carried out directly at the production units, ranging from family dairies to automated systems with robotic milking.

CH_4 was measured using sniffers with the methodology proposed by Garnsworthy et al. (2012), which is based on continuous analysis of gas concentrations. This system, implemented with Guardian NG monitors, records the concentration of gases in the environment second by second during normal feeding and milking routines.

As part of the continuity of these actions, new measurements will be taken in the state of Nuevo León, in collaboration with the **Charolais Charbray Herd Book Association of Mexico**, using the facilities of the **Agricultural Production Research Center of the Autonomous University of Nuevo León** (UANL).

Two meetings were held with the board of directors of the Charolais Charbray Herdbook of Mexico to agree on their participation with animals for methane measurements, as well as with SENASICA (National Service for Agrifood Safety and Quality) to request support with the transportation of animals to the livestock unions of Nuevo León and Chihuahua, where the measurements would be carried out.

Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias

Universidad Veracruzana

CHAROLAIS CHARBRAY HERD BOOK DE MÉXICO

UANL
UNIVERSIDAD AUTÓNOMA DE NUEVO LEÓN

CIPA
CENTRO DE INVESTIGACIÓN EN PRODUCCIÓN AGROPECUARIA

Next 6 months

- Contract and data agreements
- Measurements capacities in place
- Methane phenotyping and genotyping
- Adding data to international database
- Rumen sampling (limitations for sending overseas ?)
- New position to be advertised (project management) and new Project leader

What’s happening in Latin America – 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 & knowledge 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

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