

## Livestock Research Group Meeting

### ISARA, Lyon, France

### 1 September 2023

## MEETING REPORT

1. The 15<sup>th</sup> annual meeting of the Livestock Research Group (LRG) of the Global Research Alliance on Agricultural Greenhouse Gases (GRA) was held in-person for the first time after Covid, in Lyon, France. The one-day meeting was chaired by Sinead Leahy, New Zealand, Tommy Boland, Ireland, and Richard Dewhurst, United Kingdom (co-Chairs of the LRG).
2. This report is a summary of the key discussions and outcomes of the meeting. All the presentations are available on the GRA website ([here](#)).

## PARTICIPANTS

3. The meeting was attended by 39 participants, representing 18 member countries of the GRA and four partner organisations. Refer to Appendix 1 for the full participants' list.
  - **Countries represented:** Australia, Belgium, Denmark, Finland, France, Germany, Ireland, Japan, Namibia, Netherlands, New Zealand, Norway, Senegal, South Africa, Spain, Switzerland, United Kingdom, and the United States.
  - **Partners represented:** Centre for Coordination of Agricultural Research and Development for Southern Africa (CCARDESA), International Livestock Research Institute (ILRI), Global Methane Hub (GMH), Climate and Clean Air Coalition (CCAC), Food and Agriculture Organisation of the United Nation (FAO).

## KEY MEETINGS OUTCOMES

4. The key outcomes identified during the meeting are presented below:

Networks
Update the country representative's database and increase engagement with them
Set up regular meetings between co-Chairs and network leads
Flagships
Develop a Flagships on genetics with the support of Harry Clark (GRA Special Rep) and Rob Banks (GMH).
Members who submitted a project invited to reevaluate their proposal and check if it fits Flagship criteria by the end of October 2023.
African sub-group
Set up the African sub-group in collaboration with African regional partners and Enhanced GRA (Sega + Ackim)
Communications
Contribute to the development of plain language summary in collaboration with Harry.
Capability building
Work with the GRA Secretariat to submit projects for the CLIFF-GRADS programme.

## WELCOME AND LRG CO-CHAIR UPDATE

5. Diego Morgavi, on behalf of Xavier Fernandez (Head of the animal physiology and livestock systems division, INRAE), provided an overview of INRAE and its work. He highlighted the systemic challenges that livestock are facing globally and the importance of international collaboration to tackle climate change. He mentioned the crucial role of the LRG in fostering such collaboration.
6. The meeting was opened by Richard Dewhurst (co-Chair, SRUC, Scotland), on behalf of the co-Chairs. Richard welcomed the participants to the meeting and indicated that 18 of the 67 GRA member countries, were registered to attend over the first in-person meeting after Covid.
7. Richard provided a [high-level update on the LRG](#) on behalf of the co-Chairs over the past 12 months.
  - Thank you to Sinead Waters for the work she did as a co-Chair for 5 years.
  - The group welcome two new co-Chairs:
    - Tommy Boland, University of Dublin, Ireland.
    - Sinead Leahy, NZAGRC, New Zealand.
  - 2022 LRG meeting attracted more than 100 participants. The Group might want to consider hybrid options for future meetings to promote broader participation of all GRA members.
  - Explore the role of private industries in the GRA to support research activities.
  - Flagship projects: The networks need to develop flagship projects that will allow broad participation from all GRA members to pursue opportunities that run across countries.
  - The networks need to think of how to better involve with Africa. The setup of an African regional group might be a good way to enhance and promote African researchers' participation.
  - Projects supported by the LRG co-Chairs:
    - Global Dairy Platform and Pathways to Dairy Net Zero: The GRA is working with FAO to define dairy typologies, model GHG emissions and mitigation pathways spatially. This work will examine barriers to uptake of mitigation strategies in different countries and systems, as well as modelling the warming effect of different mixes of GHG and mitigations.
    - Following the success of the first New Zealand – Ireland funding calls, a new call has been opened in 2023 and proposals are being reviewed looking for collaborative projects involving researchers from New Zealand and Ireland.
  - The Group aims at keeping on facilitating dialogue among scientists from different GRA member nations to increase membership and involvement in networks, especially from Africa, Asia, and South America.

## GRA Special Representative Update and Q&A

8. Update provided by Harry Clark (GRA Special Representative) on behalf of the GRA Secretariat:
  - Presentation available [here](#).
  - The GRA now has 67 member countries, with Fiji joining in the past year. There are 30 formal partners, with GMH the most recent to join. There are increasing numbers of GRA activities, fellowships, and collaborative projects.
  - In keeping with increased activities of the GRA, the Secretariat has increased in size with additional staff based in NZ, Europe, Africa, and Latin America.
  - Relying on the extended GRA Secretariat, Harry will prepare a work plan for the Special Representative Team approach. This will allow to provide better regional support.
  - The current GRA Chair is Spain, with South Africa as the vice-Chair. NZ continues to host the Secretariat and support the Special Representative role.
  - Council meeting outcomes:
    - Establishment of a science communication to policy working group
    - Research Stocktake to be presented to Council members at COP28.
    - Research Groups to consider the establishment of regional groups/networks.
    - Reformat of the Council Meeting to ensure participation of all members.
    - Agroforestry flagship endorsed.
    - Need to be more holistic and reporting mitigation and adaptation co-benefits.
    - Include capability activity in the research activities.
  - CLIFF-GRADS programme, which build capability ion early career scientists, to conduct applied research in agriculture greenhouse gas emission quantification:
    - 176 alumni, with numerous awardees from Ethiopia and Nigeria.
    - R6 closed on 28 august. 273 applications were received. The results of the CLIFF-GRADS programme will be announced at COP28.
    - Opportunity for the Networks to include the students in their research projects.
  - RUFORUM fellowships in Africa: the second awarded eight research grants involving Master students and 2 PhD research grants. The PhD projects are part of a joint initiative between GRA, RUFORUM and ILRI's Mazingira Centre.
9. Q&A Session:
  - Where is the best place to get updates on GRA activities/scholarships?
    - The website needs to be updated and general effort need to be made for the GRA communications. The network leads are encouraged to promote the website in their communications.
    - In general, more work is required for the GRA comms. A new communication plan will be established.
  - CLIFF-GRADS: Would it possible to have a stocktake of the projects and themes covered by the programme since its inception? This will allow to identify and fill gaps for future calls.
    - The CLIFF-GRADS team will work on this for the next round and will work more closely with the network to prepare proposals.
  - CLIFF-GRADS: Would it be possible to expand the call to more people?
    - The call for projects is now only advertised to both GRA and Mitigate+ networks. The CLIFF-GRADS team will work more closely with the RGs to support with projects submission.

## Identifying opportunities to work together in Africa

10. This session was facilitated by Sinead Leahy. It discussed how the LRG can be more relevant to the African members and if the creation of an African sub-group will increase African researchers' participation.
  
11. Dominik Wisser, FAO, was the first presenter for this session:
  - Presentation available [here](#).
  - GLEAM model is a life cycle assessment model for livestock production, using Tier 2 approach, which started in 2006. Over the years the model has evolved and is now available online, GLEAM-I. This online tool allows direct comparison between baseline and scenarios conditions and assessment of mitigations options.
  - The FAO's Livestock Data gathered more than 100 million records such as livestock production, production systems, productivity parameters (GLEAM), feed quality and animal production.
  - The output of the model shows that total emissions in Africa are relatively low compared to other regions, but emissions intensity are very high.
  - The development of mitigation strategies will be crucial for food security as the population in Africa is predicted to increase drastically which will increase the demand for animal protein. challenges for mitigation due to high.
  - FAO also developed a GLEAM dashboard online which allows to investigate different production system species and regions to determine the sources of emissions and which GHG are produced.
  - FAO is involved in two other projects in Africa:
    - NZAGR/GDP dairy net Zero: This project is looking at barriers of mitigation and uptake rates by farmers.
    - Pathway to Dairy Net Zero: this study is done in East Africa (Kenya, Rwanda, Uganda, Tanzania) in collaboration with the Green Climate Fund, IFAD, ILRI and GDP, with a total investment of USD 400 million into the dairy sector. It aims at supporting the transition of the region's dairy systems to lower emissions and climate resilient pathways (assessment of baseline emission, exploring mitigation options and barriers to uptake). The second phase of the project expected to be completed by the end of 2023. This project is using already available data and shows that the emissions are dominated by CH<sub>4</sub> from enteric fermentation.
  - Not a lot of data are collected in this project, as it relies on already available data. The first results show that the emissions are dominated by methane from enteric fermentation.
  
12. Claudia Arndt, ILRI, presented on several projects in [East Africa](#).
  - Population in East Africa will increase significantly and animal source food. The demand per capita will increase but not as much as in Europe.
  - Claudia presented the type of livestock systems present in East Africa:
    - Small holder systems:
      - are prevalent which and are in humid and sub-humid areas, 80% arable lands with
      - Cattle size: lower than 10, average of 4
      - Milk production: average of 4L
    - Pastoral:
      - Semi-arid area
      - Larger herd: camel, cattle, small ruminant,

- Milk production: 2L. The low milk production is due to scarce water resource.
  - Stocktake looking at emissions within Africa was done and highlighted the difficulties faced such as capacity and access to equipment.
  - Tier 2 emissions model done with Ethiopian cattle showed a 30% difference between the two predictions models. The gaps can be explained by the difference in weight, milk production and diet between US cattle (used to set up the model) and Ethiopian cattle.
  - The main mitigation strategies are climate smart agriculture practices to increase productivity, increase adaptation and resilience, and reduce GHG emissions. The Climate Smart Agriculture programme in Kenya looks at the impact of climate smart strategies update on different dairy systems.
  - The adoption of climate smart practices increased milk production while reducing GHG emission intensity (on-farm data). The marginal abatement costs for extensive systems showed that cost per litre of milk was high. This will impact the adoption of climate smart practices can be difficult for systems as it requires high upfront costs. All the data was obtained directly from stakeholders.
  - GLEAM-I modelling study looking at strategies with data for Africa: the project showed that absolute emissions were reduced in only two scenarios as the intervention will increase productivity.
  - Take away messages:
  - Current capabilities for monitoring mitigation, adaptation is not enough for countries to fulfil their Nationally Determined contributions.
  - Funding allocation for equipment and capacity building is inadequate to address the existing gaps.
  - Need local equations for Tier 2 inventories.
  - Need collaborative approach to speed up capacity.
  - Funding for equipment need to be complemented with funding for staff (long term funding).
13. Habibou Assouma, CIRAD, presented on [livestock system in sub-humid Africa](#):
- The CASSECS project is a project running in three West African country: Niger, Senegal and Burkina Faso. The main goal of the project is to improve carbon balance of pastoral and agro-pastoral ecosystems, to quantify the impact of livestock system on climate change.
  - The project aims to find a way to evaluate all GHG due to livestock activities and carbon balances in a pastoral system.
  - The Green feed systems were used to evaluate GHG emissions and provided data on methane production of local feed. The data obtained were fed into the GLEAM model to help the country evaluating the contribution of the livestock sector on total GHG emissions.
  - The first results showed:
    - Seasonality of methane emissions yield, with lower value during the wet season
    - Protein supplementation with one crop legume reduces methane emissions yield
  - Collaboration between research teams is crucial. The Method to evaluate low-carbon livestock in sub-Saharan Africa research network has been set up (MeCLAN) to promote collaboration within the region. Some of MeCLAN goals are to identify research gaps in sub-Saharan Africa, building capacity and increase knowledge exchanges.
  - Take-away message:
    - In West Africa there are many experimental facilities but lack funding to support the research and staff
    - Importance of long-term funding to be able to use the equipment
    - Need for training and capacity building
    - It is crucial to develop synergies and complementarities between research teams addressing the issue of livestock and climate change

#### 14. Q&A

- How long the project will run for, especially to measure the C sequestration?
  - The project will run for four years, one year left. The idea is to start gathering data. The team involved in this project has been working on this topic for 20 years. This project is a continuity of this research and acquire new technology for the work.
- What can we do to help?
  - We need funding to continue this work, as we need more time to validate the data.
- FNN wants to engage more with African countries, is MeCLAN already operating, and will it be a good way to get more collaboration with the FNN?
  - MeCLAN started 6 months ago. It will be a good way to increase collaboration with African countries.
- Is there fund available to keep using the equipment?
  - We are looking at new funding as the current one will end soon.

#### 15. Klaas-Jan Leew, Agricultural Research Council of South Africa, presented [on livestock systems in South-Africa](#).

- South Africa is highly vulnerable to climate change especially in its grassland areas also impacting maize cultivation.
- Foot and Mouth Disease Control Zone:
  - Surveillance areas focused along South Africa borders
  - Kruger National Park is a hotspot, as FMD is endemic to this region
  - Illegal cattle movement is driven by economy, as farmers in the FMD protection zone get lower prices for their cattle.
- Recent activities:
  - Effect of crossbreeding on the carbon footprint of beef production. Requires smaller animal that can produce more.
  - Farm gate carbon and water footprint of diverse beef cattle genotypes: tested 3 breeds (indigenous breed vs European breed). Indigenous breeds are more efficient with water.
  - Methane reduction from ruminants by feed inclusion of tannin rich plants
  - Mitigation of heat stress effects on ruminants with feed additives
  - Training and information sharing with rural farmers
  - Research on drought resilient forages for livestock
- Future priorities:
  - Carbon, methane, and water footprint of extensive beef cattle production on natural grazed rangeland
  - Quantification of the effect of heat stress on milk production, methane emissions, udder health and milk composition for the development of adaptation and mitigation strategies
  - Improving feed digestibility of animal feeds

#### 16. The panel discussion was facilitated by Sinead Leahy. The discussion focused on the two following topics:

- How can we make the LRG relevant to the African members?
  - The political agenda in Africa is focusing on adaptation. Mitigation is done through co-benefit.

- Lack of data making it difficult to move from T1 to T2. Cooperation with regional entities will help fill this gap. Adaption, Mitigation co-benefits projects would support this work.
- Need to raise awareness on the importance of mitigation. CCARDERSA is well placed to support the dialogue with political institutions and promote the importance of mitigation
- CCARDEASE and sub-regional organisation
- Need for capacity development and enhance dialogue with
- Regional collaboration and data sharing is important to help fill in data gaps.
- Need support to develop a stocktake for Africa. This will require a good coordinator to run the project.
- Will the establishment of an African sub-group be useful to enhance participation of African researchers?
  - Need of a place to discuss with scientist and policy makers, to support the research on mitigation.
  - Collaboration and data sharing are crucial to support countries moving from Tier 1 to Tier 2.
  - Establishment of a sub-African group in collaboration of regional and sub-regional organisations will be a good way to promote participation and promote mitigation.

## Policy Initiative

17. This session was facilitated by Harry Clark. It aimed at developing idea to better communicate sciences results to Council members and policy makers.
18. Harry suggested different ways for the group to improve science communication to policy makers:
  - Develop plain language summary of key science papers and reports. These summaries will need to be in a format easily accessible and comprehensible to the Council members and highlight information important for policy makers.
  - Production of specific reports on demand, for example the difference between GWP and GWP\*.
  - Develop and promoting a GRA position.
19. The first two positions were the preferred options of the group. These options will be further developed, and the Group will commit on providing some key papers.
20. The Council might come up with other ideas for the Group to explore. However, The Council needs to be clear on what they are expecting from the RGs.
21. Policy briefs could also be an option to explore. If an issue needs to be further explained, it could be put into a policy brief. Partners could help in developing evidence-based policy brief, not associated with any positions.
22. The Group needs improve its overall communications, and a new communications plan will be added in the workplan.
23. Q&A
  - How to make the information is going to the right person?
    - Need to ensure we have the right persons in the Council. This will be done via the Secretariat.
  - What will the Council repo do we need to ensure they will spread the information to the appropriate channel?

- Need to ensure the Council members will be promoting the information to their ministry.

## Partners and Networks Updates

### Partners updates

24. The first part of this session was dedicated to the GRA partners, who provided an update on their activities.
25. Gregory Kohler, [Climate and Clean Air Coalition \(CCAC\)](#):
  - CCAC is a global, voluntary partnership dedicated to addressing short-lived climate pollutants.
  - Network: more than 400 members from governments, IGOs, financial institutions and civil society organisations.
  - Strategic directions:
    - High level political leadership: engaging leaders to showcase how addressing air pollution, health and other local priorities can simultaneously drive climate ambition
    - Technical support and assistance
    - Strengthening case for action
  - Supporting the Global Methane Pledge (GMP) Implementation:
    - Core implementing partner along IMEO and GMI
    - Work closely with GMP Participating Countries to support national methane planning and action
    - GMP participating countries encouraged to develop or update a Methane Reduction Plan
    - Help connect GMP Participating Countries to technical and financial assistance
  - Who can join the Hubs?
    - CCAC Hubs bring together governments, inter-governmental, and non-governmental organizations along with private sector leaders to drive action in the sector and tackle SLCPs from every angle.
  - Why joins the Hubs?
    - Connect with governments
    - Knowledge sharing
    - Matchmaking
    - Funding opportunities
    - Putting resources where they are needed
26. Rob Banks, [Global Methane Hubs \(GMH\)](#):
  - GMH is a philanthropic pooled fund, non-profit registered in the US, which addresses methane emission across the economy. The agriculture program aims at reducing methane emission from the sector via:
    - Accelerator programme:
      - Aiming to raise more than USD200 million
      - Focused on R&D to enable reducing emissions from enteric fermentation
      - Establishment of a Science Committee (gathering experts in vaccine development, nutrition, rumen, genetics, and genomics)
    - GMH can:
      - Invest alone or in partnership, and with both public and private partners



- Public good
- No locking up of IP (projects with IP will not be supported)
- GMH Activity:
  - SOC members surveying and summarising research landscape and developing potential KPIs for outputs
  - Genetics:
    - Understanding activity in methane recording
    - Equipment and methods
    - Stages of implementation into breeding programme
  - Support collaboration with GRA Flagship concept(s) is a good way to work
- Rob offered to support the LRG members with the drafting of proposal. Interested members need to contact him directly.

27. Claudia Arndt, [International Livestock Research Institute \(ILRI\)](#):

- Claudia provided an overview of the current activities, future activities and capability needs at ILRI.
- Relevant activities:
  - GHG Direct Emission Measurement:
    - Landscape in different land-use systems (EC towers & remote sensing with FloX)
    - Animal chambers
    - Manure, soil, and water (manual and automatic chambers)
    - Farm-scale anaerobic digesters (fixed-dome and prefabricated biodigesters)
  - Carbon sequestration:
    - Pasture restoration in humid systems (highlands)
    - Soil carbon storage and GHG emissions from different land-use systems
  - GHG Indirect Emission Measurements:
    - Activity data collection to define farm typologies and estimate enteric and manure emissions
    - Economic farm data collection for MACC
    - On-farm animal health data for estimating its effects on productivity and emissions
    - On-farm data to estimate biogas and biofertilizer production and use, and their socio-economic, health, and environmental co-benefits.
  - Laboratory facilities:
    - GHG measurement lab
    - Soil, manure, and biogas lab
- Future priorities:
  - GHG Direct Emission Measurements:
    - Landscape scale in more land-use systems (EC towers)
    - Animal: set up of SF and development of proxies for enteric methane emissions
    - In-vitro digestibility and methane mitigation assays
    - Intervention testing to reduce animal and manure GHG emissions (intensities)
  - Carbon sequestration and circular economy (biogas):
    - Pasture restoration in dry lands and effects on soil carbon biodiversity
    - Improve MRV system for soil carbon sequestration
    - MRV for GHG emissions and emissions reductions for biogas sector
    - Innovate biodigester technologies tailored to the energy needs of farms, various wastes, and agro-ecologies
  - GHG indirect Emission Measurements:
    - Validation of IPCC equations for African systems

- Standardised activity data collection (using ODK) and data analysis workflow
- Closer collaboration of effects of on-farm interventions
- Capability needs:
  - GHG Direct Emission Measurements:
    - Animal set up for SF6
    - Manure: ammonia volatilization
    - Anaerobic biodigesters (on-farm and in-vitro)
    - Rumen, biodigester and soil microbiology
  - Carbon sequestration and circular economy (biogas):
    - Biodiversity of vegetation and invertebrates
    - Scaling of GHG emissions and soil carbon models in different land-use systems and scenario testing (land conversion)
    - Scaling up biodigesters investment through innovative technology, climate financing and public-private partnerships
  - GHG Indirect Measurements:
    - MACC analyses
    - Modelling
  - Capacity building:
    - Shared student supervision
    - Students, scientist, and lab technician exchange

28. Dominick Wisser, [Food and Agriculture Organization of the United Nation \(FAO\)](#):

- FAO looked at cattle population by production system and category computed using the “Inventory of GHG Emissions from Dairy Cattle in Kenya from 1995 – 2017”
- The proportion of dairy Indigenous was computed using data from the Kenya Reducing enteric methane project
- The FAO project compares indigenous and exotic cattle in three different systems and develop possible mitigation options to reduce methane emissions and identifies barriers to adoptions.
- The outcomes of the project can support the implementation of policies and inform the development NDCs.
- Way forward:
  - Projection of emissions
  - Measures to strengthen dairy sector
  - Institutional frameworks (MRV, Capability building needs)

29. Simba Sibanda, [Food, Agriculture and Natural Resources Policy Analysis Network \(FANRPAN\)](#):

- A regional support to national livestock GHG inventories in Southern Africa. This project, developed in collaboration with the University of Pretoria and NZAGRC, aims at moving four selected Southern African countries from Tier 1 to Tier 2 GHG inventories for cattle.
- The countries were selected as they share similar livestock systems.
- The project would facilitate the development of policies which will support national adaptation and NDCs.
- All available data from each country were collected to identify gaps in the inventory.
- The regional data were combined in a database and shared among selected countries to support compiling national cattle GHG inventories.
- Involving all relevant stakeholder institutions and providing training on data collection, inventory calculation and GHG inventory reporting.<sup>3</sup>
- Capacity needs:

- Development of SOP for GHG inventory compilation
  - Documentation of processes
  - Equipment for measuring animal performance
  - Use of GHG emission data for policy engagement in support of NDCs
30. Baitsi Podisi, [Centre for Coordination of Agricultural Research and Development for Southern Africa \(CCARDESA\)](#):
- CCARDESA is a regional organisation aiming to bring a sustainable agricultural growth and socio-economic development in the SADC.
  - Dialogue was set up with NZAGRC and South African stakeholder to discuss the status of research in agricultural GHG emission in South Africa and future directions. The dialogue highlighted opportunities and priorities for strengthening agricultural GHG research coordination.
  - Key challenges:
    - Largely fragmented research governance system
    - Limited availability of GHG data
    - Lack of long-term research funding
  - Recommendations:
    - Stocktaking of agricultural GHG projects in South Africa
    - Highlight appropriate research coordination mechanisms at regional scale
    - Establishment of a coordination mechanism
    - Develop a regional financing mechanism for climate adaptation and mitigation research in the SADC
  - Way forward: Set up a working group to develop a common research and application agenda
  - Role of the Working Group:
    - Coordination across national research agencies
    - Developing and maintaining active databased of agricultural GHG research activities in the region
    - Investment and operational strategy
    - Advancing the development of a regional financing mechanism

## Networks updates

31. The LRG has five science networks, focused on strengthening collaboration in the main areas of livestock GHG research.
32. [Feed and Nutrition Network \(FNN\)](#), presented by David Yáñez-Ruiz:
- Objectives:
    - Summarise and evaluate the available data on mitigating GHG emissions of ruminants by nutritional means
    - Develop sound recommendations on methane mitigation by nutritional means for stakeholders
    - Identify gaps in knowledge and focus research on priority issues
  - 2022 Activities:
    - More than 10 publications
    - Annual workshop was held in Orlando during 2022 GGAA
    - 2 online workshops organised by the Feed Additives Flagship Project
    - Projects: Global Network (2014-2014); CEDERS (2017 – 2021); Integrity (2022 – 2026)
    - LAC and Southeast Asian projects

- Beginning of Feed Additives Flagships (2022 -2024)
  - 2023 Activities:
    - 2023 Annual Workshop in November 2023. This event will be held in collaboration with Claudia Arndt and will focus on African projects.
    - Developing ideas to increase engagement
    - Bimonthly list of papers published by the groups in the network
  - FNN as a Network:
    - 20 new colleagues joined since June 2022, from seven countries (Argentina, Chile, Belgium, Australia, UK, Switzerland, and Spain)
    - Missing still is Eastern Europe, Africa, Middle East
33. [Animal Selection Genetics & Genomics Network \(ASGGN\)](#), presented by Suzanne Rowe:
- ASGGN is a forum for scientists exploring the impact of genetics technologies for managing livestock GHG emissions.
  - ASGGN Members:
    - Over 200 members, in 40 countries
    - Still need to get more membership from Africa, Southeast Asia
  - Activities:
    - Group present on social media (Twitter) and has its [own webpage](#)
    - Annual meeting well attended and discussed workplan for the year, research coordination
    - The network organised webinars and publications
    - 2022 World congress on Genetics in The Netherlands was well attended (75 participants from 25 countries, 8 talks covering sheep, beef and dairy cattle and technologies and methods)
    - Enteric Flagship: more than 1,000 samples collected over five countries. This is an on-going projects and samples can be sent for analysis.
    - Methane predicts: Project funded by NZ and Ireland, aiming at developing and validating high throughput predictors for large capacity screening of methane emitting ruminant at individual and system level. This project could be expanded into a Flagship.
    - Grass to Gas (FACCE ERA-GAS project): sharing protocol and bringing technology together
    - Support from CLIFF-GRADS alumni to help with website and communications
34. [Rumen Microbial Genomics Network \(RMG\)](#), presented by Milka Popova
- The network is now co-lead by Milka Popova (INRAE, France), Jana Seifert (HOLMIR, Germany) and Yanfen Cheng (Nanjing Agricultural University, China)
  - Activities:
    - June 2023 Workshop associated with International Symposium on Gut Microbiology: nine talks covering:
      1. Biggest challenges and how to overcome them and aim towards meeting local and global Net Zero
      2. Identify Research Gaps
    - Outcomes:
      1. Need for more in vivo trials
      2. Need for long-term trials
      3. Consideration for animal physiology and health
      4. Emphasize natural methane mitigation strategies
  - Future event: Launch of the Rumen Gateway Flagship led by Sharon on 13 October 2023

- 12 hubs, with the main hub is in Belfast
- Welcome new samples, which can be sent to the closest hub
- Increase involvement of LMIC to capture microbial diversity
- All involved become an author of a major publication

35. [Manure Management Network \(MMN\)](#), presented by Tony van der Weerden.

- Research update:
  - focused on reducing GHG emissions from livestock production and increasing the nutrient use efficiency of manures and soil organic matter by the improvement of excreta management
- Dataman:
  - Database completed
  - Keen to continue expanding, so get in touch.
- Stocktake of GHG Manure Management:
  - Identify potential collaborators
  - List current research effort and focus to identify gaps
  - Collecting key information on current GHG measurement, mitigation, and modelling research projects
  - Work available from the [GRA MMN](#) website
- How to get involved:
  - The network is looking for a co-Chair
  - Expand DATAMAN database via contributing data
  - Lead or assist with annual stocktake of projects
  - Assist with updating experimental protocols for housing and storage measurements
  - Lead the development of rapid on-farm tests for manure nutrient supply

36. [Animal Health Network \(AHN\)](#), presented by Şeyda Özkan:

- The AHN aims to bring together researchers, governments, non-governmental organisations, private sector from multiple background to understand the impact of climate change on animal health.
- ANH Network:
  - 70 members across 24 countries
  - Still need to increase membership in Africa, Southeast Asia, Eastern Europe
- Activities updates:
- Future activities
  - Regional mapping workshop will be held in February 2023 in collaboration with ILRI. Please contact Seyda if you would like to participate or co-host.
  - Development of a Flagship project building on the regional workshop and the FAO paper on animal health role in NDCs. Already 30% funding from partners.
  - Cost action proposal to promote dialogues among the actors the livestock sector.
  - New project: Estimating the effect of diseases on cattle productivity and GHG emission in smallholder dairy systems of low and middle-income countries (partnership with EDF, ILRI).
  - ANH Newsletter: should be available by the end of the year
  - New ANH's communication coordinator: Lydia Lanzoni.

## Working together to support the GRA's research flagship

### Flagships updates

37. This session was facilitated by Harry Clark. The first section of the session provided an update on the two Flagship projects under the LRG.
38. David Yáñez-Ruiz provided the update for the [Feed Additives Flagship](#):
- The project is coordinated by David Yáñez-Ruiz (CSIC, Spain), Andre Bannink (WUR, Netherlands) and Florencia Garcia (UNC, Argentina)
  - Background and goal:
    - Developing technical guidelines on good practice to develop and test feed additives, as well as accounting for the effect of using mitigation strategy.
    - Project also aim at developing a global network of experts to share knowledge
    - Guidelines here to support both academy and industry
  - A pathway has been designed to regroup all the topic needing to be covered under this flagship, and six topics were identified.
  - Six working groups were developed to cover the identified topics, with leaders for each package. 55 members from 22 countries are contributing to this work (Asia, Europe, North America, Latin America, and Oceania).
  - The Journal of Dairy Science has accepted to publish the guidelines as a compilation of papers (each paper developed by each working group. The team is now working on coordinating the effort with the different working groups to meet the following timeline:
    - Manuscript ready – December 2023
    - Internal revision – Beginning of 2024
    - Manuscript submission – Mid 2024
  - The project interacts with other international initiatives (MiLCA) and institutions (e.g EDF, and UC Davis) to avoid overlaps.
39. Q&A:
- Is there a communication plan for this project as some chapter might be relevant to policy? Will the work be promoted through different route, different language (especially for registration)?
    - Some communications plans have been made for policy. When closer to the date to hand the manuscript a more detailed communication plan will be done.
  - Would it be possible to have someone from Africa contributing to the Flagship?
    - The Flagship is focusing on guidelines, and the outcome will be useful to many countries. The initial call to participate in the project was open to all members. At this point, the project has progressed, and the guidelines are being developed. It would be possible to include new members, although it might not be necessary to have someone from each country.
40. The second update was provided by Sharon Huws on the [Rumen Gateway Flagship](#).
- This project is built on the results of the Hungate project, which provided crucial insight into rumen microbiome and increased the understanding of rumen microbiome.
  - Sequencing has been the main methodology, but they are issues around assembling and annotating genomes.

- Pure culture and genome availability will enhance ability to assemble and annotate
- This project will allow to:
  - Understand the mechanisms of action of feed additives on the inhibition of methane
  - Understand the mechanism of action on isolates to understand how they work and highlight potential resistance
  - Discovered enzyme could be used by biotech industries
- Plan:
  - Culture across the world with almost 15 hubs (Belfast being the main hub)
  - 12<sup>th</sup> October: official launch
  - Characterization of novel rumen bacteria
  - Co-hubs are important to:
    - collect data on different ruminant species with slightly different microbiome and capture novelty.
    - Send samples to the closest lab and reduce issues with sending microbial material abroad
  - All researchers and lab sending samples will be put as co-authors on the publications
  - Data sharing: isolates will be deposited in an open-access culture collection.
- Traditional microbial methodologies will be used for this project (media type, direct plating, MALDI TOFF...)
- The project is open to new partners and is looking for someone to lead the work on phenotyping

## Flagships guidelines and new flagship ideas

41. The second part of this session, led by Harry Clark, focused on the Flagships guidelines, and examines proposed flagships. Harry Clark explained that there are now new ways to fund project researchers, e.g philanthropic organism (GMH, Gates foundation...), and the Group needs to cease these opportunities to support their research.
42. Even though there are no clear pathways to refunding though these organisms, it is important to develop projects now. The flagship projects could be a good way to attract fundings, even though the efficacy of this project still needs to be evaluated.
43. Harry reviewed some of the criteria for a Flagship:
  - Within GRA scope
  - Broad GRA benefits
  - Wide participation – low-cost basis participation, as cost should not be a barrier for involvement
  - Generating new knowledge
  - Identify leader
  - Min 30% of funding
  - Route for funding identified
44. Harry encourages members who submitted a proposal to review them and contact him if they want support into developing their project.
45. The Group also needs to consider how many proposals we need to have to keep

## **Working together: the LRG in 2023 and beyond**

46. A wrap up of the day was provided by Richard Dewhurst:
- Set up an African sub-group with the support of GRA partners
  - Define areas where co-Chairs can support the networks
  - MMN looking for a new co-lead
  - Develop a communication plan
  - Develop plain language summary
  - Rumen Gateway project launch in October 2023
  - Share ideas for the development of new Flagship projects
  - Using new funding routes to support research projects
  - Promote and plan CLIFF-GRADS priority areas
  - Explore links to existing large projects in Africa
  - ANH organising a workshop in 2024
  - Bring more support to African colleagues to build capability in early career scientist (co-supervision)
  - Need for long-term project funding for LMICs
  - Better leverage philanthropic fundings

## **Next meeting**

47. The next LRG annual meeting will be held alongside the AgriGHG Symposium in Berlin (Germany), in September/October 2024 (date TBC).



## Appendix 1: Participants List

Country	Attendees
<b>GRA Member Countries</b>	
<b>LRG Co-Chair (New Zealand)</b>	- Sinead Leahy (NZAGRC) (sinead.leahy@nzagrc.org.nz)
<b>LRG Co-Chair (Ireland)</b>	- Tommy Boland (University of Dublin) (tommy.boland@ucd.ie)
<b>LRG Co-Chair (United Kingdom)</b>	- Richard Dewhurst (Scotland's Rural College) (Richard.Dewhurst@sruc.ac.uk)
<b>Argentina</b>	- Florencia Garcia (Universidad Nacional de Córdoba, Facultad de Ciencias Agropecuarias) (fgarcia@agro.unc.edu.ar)
<b>Belgium</b>	- Nico Peiren (ILVO) (nico.peiren@ilvo.vlaanderen.be)
<b>Benin</b>	- Habibou Assouma (CIRAD) (habibou.assouma@cirad.fr)
<b>Denmark</b>	- Peter Lund (Aarhus University Department of Animal and Veterinary Sciences) (peter.lund@agrsci.dk)
<b>Finland</b>	- Matti Pastell (Natural Resources Institute Finland (Luke)) (matti.pastell@luke.fi)
<b>France</b>	- Diego Morgavi (INRAE) (diego.morgavi@inrae.fr) - Milka Popova (INRAE) (milka.popova@inrae.fr) – <b>RMG Lead</b>
<b>Germany</b>	- Cornelia Metges (Research Institute for Farm Animal Biology (FBN)) (metges@fbn-dummerstorf.de)
<b>Japan</b>	- Keiichi Hayashi (Japan International Research Center for Agricultural Sciences (JIRCAS)) (khayash@affrc.go.jp) - Koki Maeda (Japan International Research Center for Agricultural Science) (k_maeda@affrc.go.jp)
<b>Namibia</b>	- Sarafia Ashipala (Ministry for Agriculture Water and Land Reform) (sarafiashilimela@gmail.com) - Deidre Januarie (Ministry of Agriculture, Water and Land Reform) (deidre.januarie@gmail.com)
<b>Netherlands</b>	- Andre Bannink (Wageningen Livestock Research) (andre.bannink@wur.nl) – <b>FNN Lead</b> - Ernst Van den Ende (Wageningen University and Research) (ernst.vandenende@wur.nl)
<b>New Zealand</b>	- Suzanne Rowe (AgResearch) (suzanne.rowe@agresearch.co.nz) – <b>AGGN Lead</b> - Tony van der Weerden (tony.vanderweerden@agresearch.co.nz) – <b>MMN Lead</b>

<b>Norway</b>	- Vibeke Lind (NIBIO) (Vibeke.lind@nibio.no)
<b>South Africa</b>	- Klaas-Jan Leew (Agricultural Research Council of South Africa) (Kleeuw@arc.agric.za) - George Shole (Department of Agriculture Land Reform and Rural Development) (GeorgeS@dalrrd.gov.za)
<b>South Korea</b>	- Sang-Suk Lee (Sunchon National University) (rumen@scnu.ac.kr)
<b>Spain</b>	- David Yanez-Ruiz (Estacio Experimental del Zaidin (CSIC)) (david.yanez@eez.csic.es) – <b>FNN Lead</b>
<b>Sweden</b>	- Rebecca Danielsson (Swedish University of Agricultural Science) (rebecca.danielsson@slu.se)
<b>Switzerland</b>	- Lutz Merbold (Agroscope) (lutz.merbold@agroscope.admin.ch) - Mutian Niu (ETH Zurich) (mutian.niu@usys.ethz.ch)
<b>United Kingdom</b>	- Ollie Szyszka (DEFRA) (ollie.szyszka@defra.gov.uk) - Nick Wheelhouse (Edinburgh Napier University) (N.Wheelhouse@napier.ac.uk) – <b>AHN Lead</b>
<b>United States of America</b>	- Joshua Taylor (United States Department of Agriculture) (bret.taylor@usda.gov)

<b>GRA Partner Organisations</b>	
<b>CCAC</b>	- Gregory Kohler (kohlergb@gmail.com)
<b>CCARDESA</b>	- Baitisi Podisi (bpodisi@ccardesa.org) - Simbarashe Sibanda (ssibanda@fanrpan.org)
<b>CGIAR</b>	- Claudia Arndt (Claudia.Arndt@cgiar.org)
<b>FAO</b>	- Dominik Wisser (dominik.wisser@gmail.com) - Seyda Ozkan (Seyda.Ozkan@fao.org) – <b>ANH Lead</b>
<b>GMH</b>	- Robert Banks (rbanks@une.edu.au)
<b>GRA Secretariat</b>	- Harry Clark (GRA Special Representative) - Joanne Monjol (jo.monjol@globalresearchalliance.org)