

GLOBAL
RESEARCH
ALLIANCE

ON AGRICULTURAL GREENHOUSE GASES

The role of GRA in accelerating GHG mitigation, capacity building and leveraging co-benefits

Hayden Montgomery
Special Representative
28 October 2021

AT A GLANCE

65
member
countries

24 partner
organisations

Over **3000** scientists
involved in activities of the GRA

72 international
collaborative projects
supporting the GRA

172 fellowships awarded to
recipients from **45** countries

4 Research
Groups

Paddy Rice
Research
Group

Livestock
Research
Group

Croplands
Research
Group

Integrative
Research
Group

17 Science
Networks

40 technical training
workshops held

23 technical guidelines,
resource materials and
databases produced



For countries, participation in the GRA...

- ✓ **contributes to the formation of transdisciplinary teams**
- ✓ **contributes to the formation of students and early career scientists**
- ✓ **permits access to knowledge and infrastructure**
- ✓ **permits access to financing for strategic projects**
- ✓ **contributes to the creation and transfer of better information for decision making**

Livestock Research Group

Linking global science and building global science capacity to reduce the emission intensity of livestock production systems and increasing the quantity of carbon stored in soils supporting these systems

Networks

- Animal Health
- Animal Selection, Genetics and Genomics
- Feed and Nutrition
- Manure Management
- Rumen Microbial Genomics



www.lrg2020.com



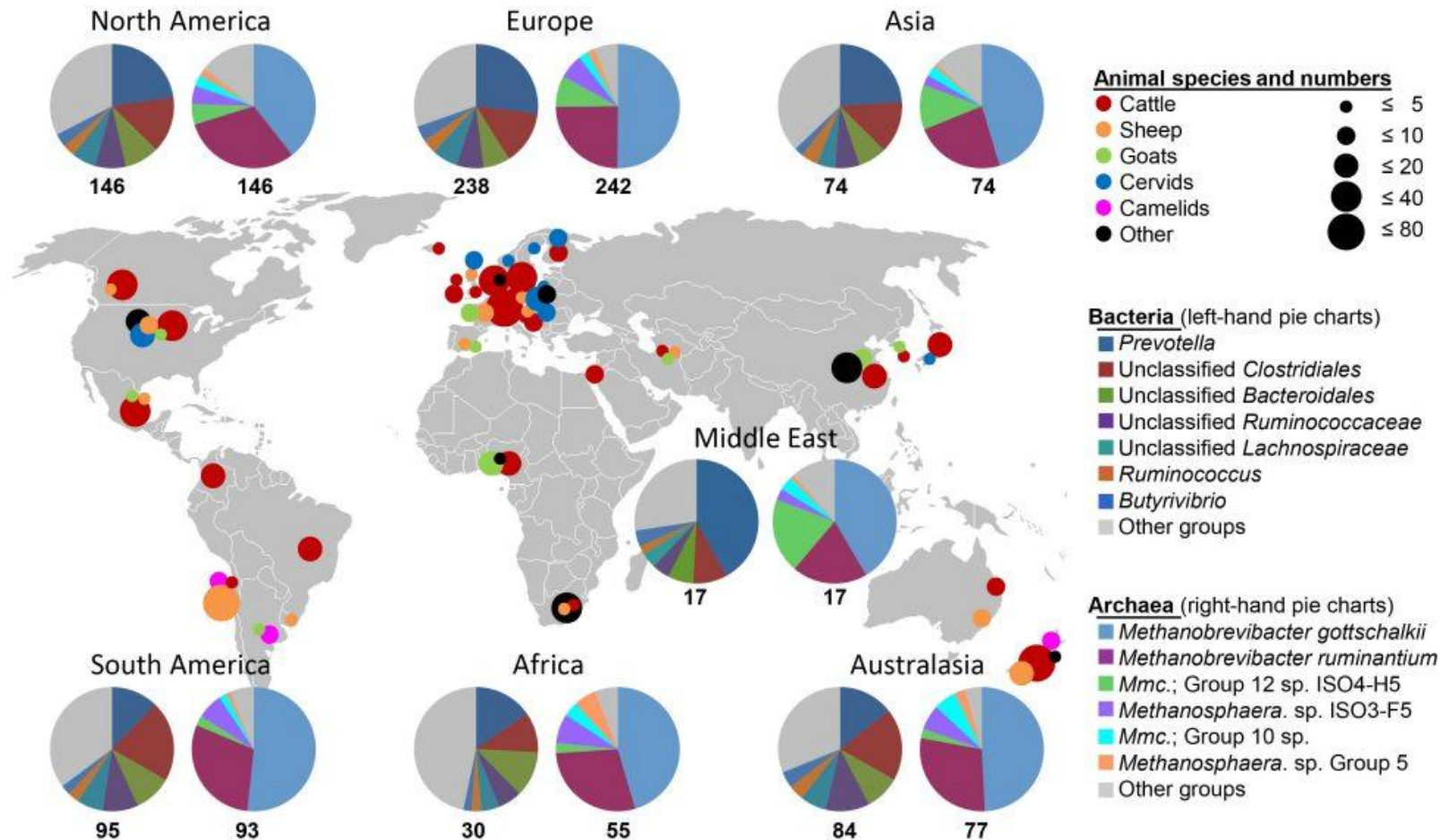
www.livestockresearchgroup.com

Searching for the silver bullet within nature's diversity

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Global solutions to reduce methane from ruminant animals are feasible because the microbes causing the emissions are similar around the world



140 scientists from **73 organisations** in **35 countries** contributed to the rumen census, with microbial samples collected over two years.

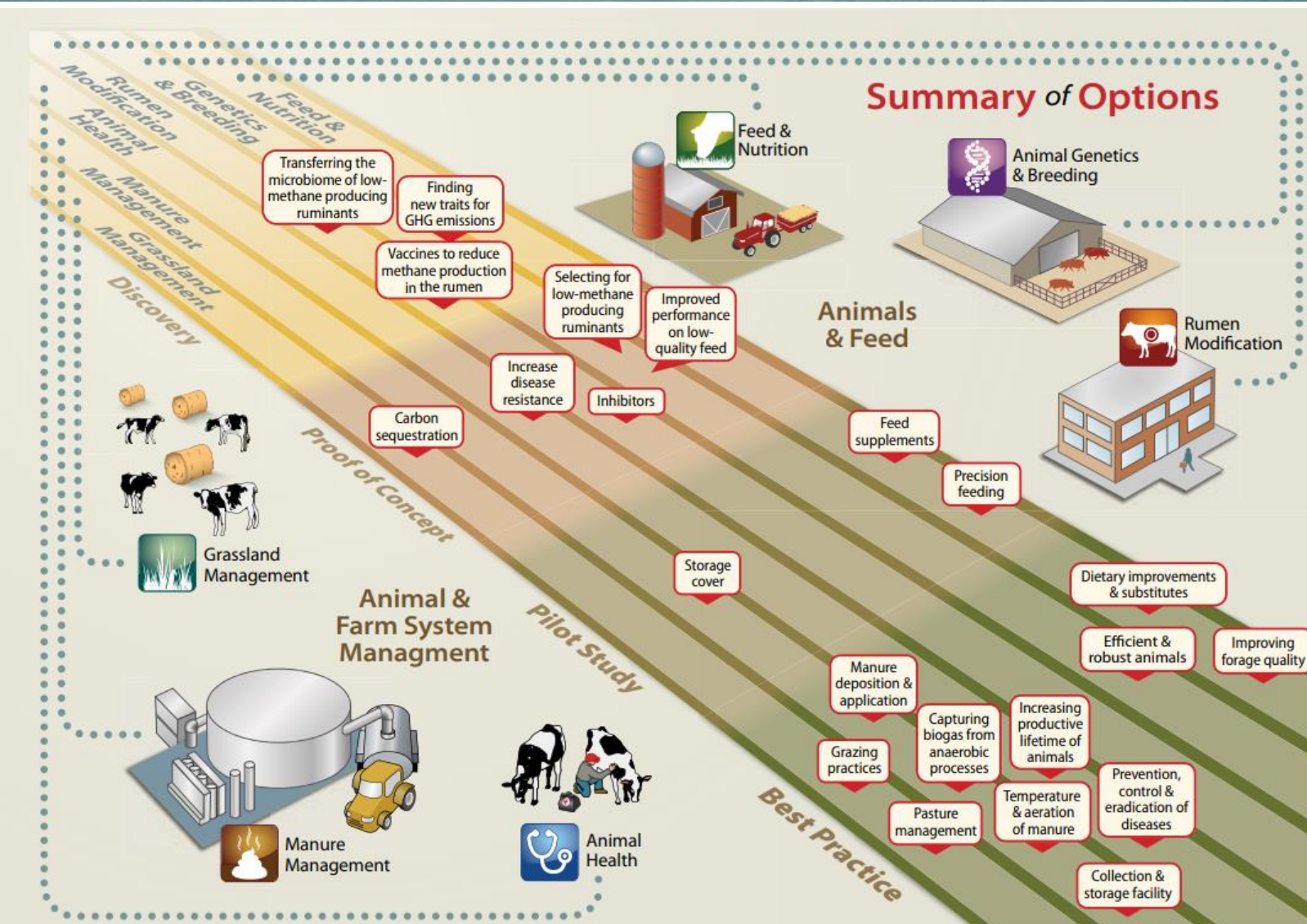
Global Rumen Census

RMG NETWORK
RUMEN MICROBIAL GENOMICS NETWORK

Best practice and emerging options

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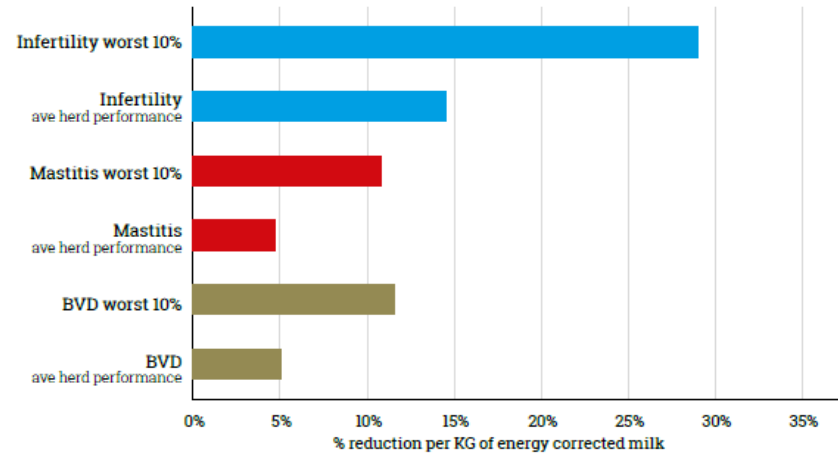
<https://globalresearchalliance.org/wp-content/uploads/2018/02/LRG-SAI-Best-Practice-Guidelines-2014.pdf>

Improved animal health as a means to increase productivity...and reduce GHG

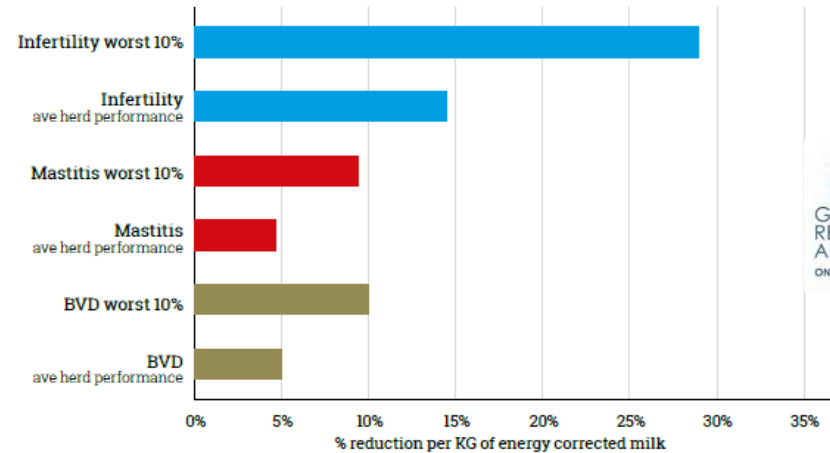
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Potential reductions in GHG intensity of milk production in the UK



Potential reductions in GHG intensity of milk production in Chile



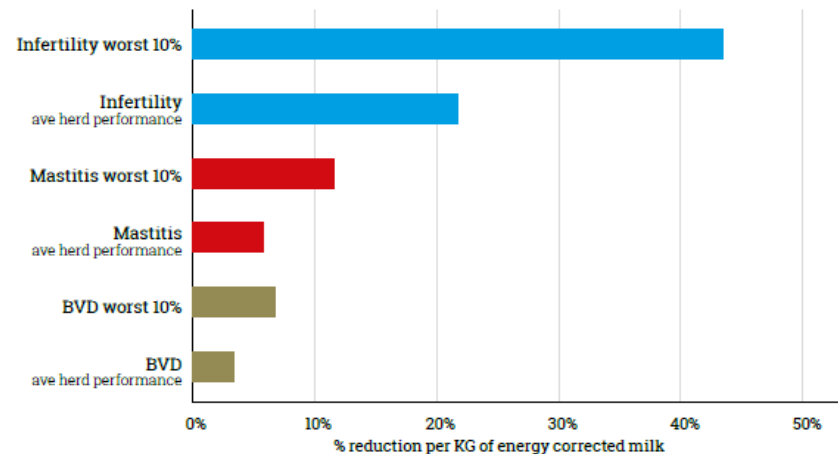
Comparative study in Chile, Kenya and UK

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GLOBAL DAIRY PLATFORM

dsf
Dairy Sustainability Framework

Potential reductions in GHG intensity of milk production in Kenya



Cattle health potential for reducing GHG intensity

The data are for three conditions with the average herd level potential for each and the potential for the worst 10% of herds.

Condition	Potential reductions in GHG intensity		
	UK	Chile	Kenya
BVD	5%	5%	3%
BVD worst 10%	12%	10%	7%
Mastitis	5%	5%	6%
Mastitis worst 10%	11%	9%	11%
Infertility	14%	14%	22%
Infertility worst 10%	29%	29%	43%

Economics

The range in costs and benefits across the three geographies*.

AHIM	Action – Cost range in the 3 Geographies - \$US	Benefit \$US
Fertility –Reducing CI by 10 days	2-15/cow/year	20-25/cow/year
BVD	2-6/cow/year	Circa 68/cow/year
Mastitis	4-12/cow/year	200-670/case/cow/year

* Further detail on the economics is provided in the report.

WORKING WITH THE SECTOR

Global Research Alliance on Agricultural Greenhouse Gases is a knowledge partner of the Pathways to Dairy Net Zero initiative.

- ✓ Undertaking a review of current and prospective mitigation options for the global dairy sector.
- ✓ Developing a new dairy systems classification.
- ✓ Modelling a range of scenarios to 2050 in order to demonstrate plausible mitigation pathways, applicable to different dairy systems.

Builds on a considerable body of work that has already been conducted using FAO's GLEAM model, as well as drawing on research and other knowledge from dairy sector experts in GRA member countries.

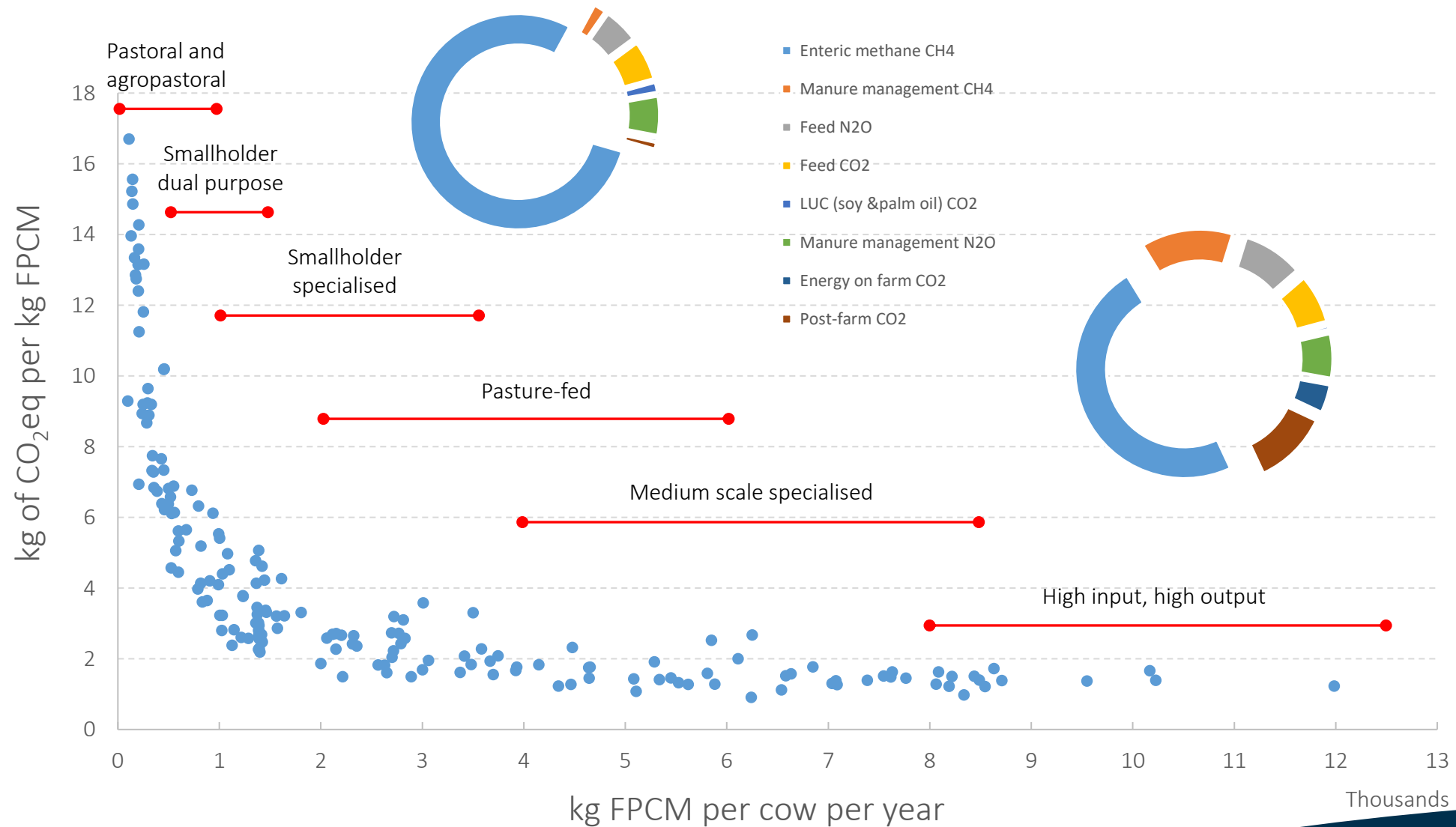


**NEW ZEALAND
AGRICULTURAL GREENHOUSE GAS
Research Centre**



Assessing mitigation by system type

PATHWAYS
TO DAIRY
NET ZERO.



You can't mitigate what you can't measure

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CCAFS Report No. 17

Measurement, reporting and verification of livestock GHG emissions by developing countries in the UNFCCC: current practices and opportunities for improvement



Andrew Wilkes
Andy Palear
Eva Wollenberg
Suzanne van Dijk



MRV Platform for Agriculture
Measuring, reporting and verifying greenhouse gas emissions and mitigation

KNOWLEDGE PORTAL ABOUT CONTACT

Science & implementation of MRV for technical experts & policy-makers, starting with livestock

Learn More

MRV in Practice

Summaries of MRV concepts and methods for agriculture, with details for the livestock sector



Understand the international MRV framework under the UNFCCC

Learn More >



Develop an MRV system

Learn More >

Case Studies

Practical methods for compiling GHG inventories for livestock, by country and by practice



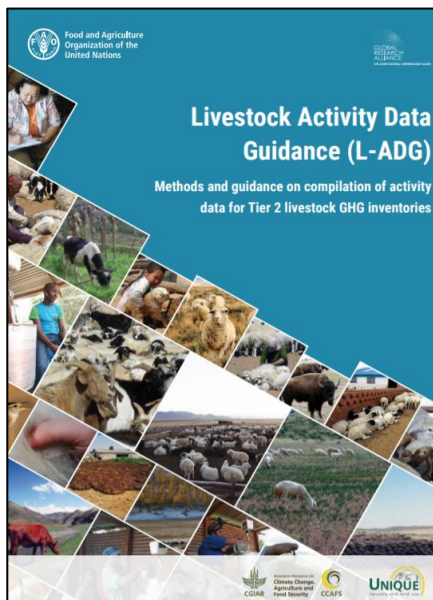
Country inventory: Austria

Learn More >



Country inventory: Colombia

Learn More >



Livestock Activity Data Guidance (L-ADG)

Methods and guidance on compilation of activity data for Tier 2 livestock GHG inventories

MAGGnet

Managing Agricultural Greenhouse Gas Network

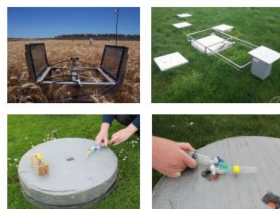


Handbook of Monitoring, Reporting, and Verification for a Greenhouse Gas Mitigation Project with Water Management in Irrigated Rice Paddies



Version 1
February 2018
Institute for
Agro-Environmental
Sciences, NARO, Japan

Nitrous Oxide Chamber Methodology Guidelines



July 2015
Edited by Cecile de Klein
and Mike Horsey
Version 1.1

Guidelines for Measuring CH₄ and N₂O Emissions from Rice Paddies by a Manually Operated Closed Chamber Method



Version 1
August, 2015
National Institute for
Agro-Environmental
Sciences, Japan

Guidelines for use of sulphur hexafluoride (SF₆) tracer technique to measure enteric methane emissions from ruminants



April 2014

GreenFeed standard operating procedure



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Since 2012, MAGGnet has compiled metadata from over 337 experimental studies from 23 countries.

GRA facilitating multi-country collaboration

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2021 JOINT CALL ERA-NET Cofund

SusAn, FACCE ERA-GAS,
ICT-AGRI-FOOD and SusCrop



“Circularity in mixed crops and livestock farming systems
with emphasis on climate change mitigation and
adaptation”

Project title	Project acronym	Coordinator	Countries involved
Strategies for circular agriculture to reduce GHG emissions within and between farming systems across an agro-ecological gradient	CircAgric-GHG	Norwegian Institute of Bioeconomy Research, NIBIO, Norway	NO , KE, ES, IE, DE, IT, ZA, UK
Connecting sustainable agroecosystems and farming with circular bioeconomy and new technologies	ConnectFarms	Consorzio Interuniversitario Nazionale per le Scienze Ambientali, Italy	IT , BG, LT, EE, ES, PL, TR
Multi-criteria assessment, decision support and management tools for sustainable circular mixed farming systems for dairy production	DairyMix	Leibniz Institute for Agricultural Engineering and Bioeconomy, Germany	DE , IE, IT, PL, FR, NO, BE, AR
Integrated crop-ruminant livestock systems as a strategy to increase nutrient circularity and promote sustainability in the context of climate change	INTEGRITY	National Institute of Agricultural Technology, Argentina	AR , ES, FI, UK, NZ, PE, UY, FR, IE
Mitigation and adaptation through better biomass cycling in crop livestock systems of north and western Europe	MI BICYCLE	Wageningen University, The Netherlands	NL , DK, UK, FR
Balancing production and environment	PROENV	Aarhus University, Denmark	DK , NO, ES, IT
Back to the Future: reintegrating land and livestock for greenhouse gas mitigation and circularity	ReLive	University College Dublin, Ireland	IE , FR, NL, DE, ES, FI, PL, EE, NZ, CL
Synergies in integrated systems: Improving resource use efficiency while mitigating GHG emissions through well-informed decisions about circularity	SENSE	The James Hutton Institute, UK	UK , NL, DE, IT, BR, AR, UY
Solutions for GHGs emissions mitigation for the mixed farming systems across different European climates	Solution4Farming	Beia Consult International, Romania	RO , PL, ES, FI

CLIFF-GRADS

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Purpose

- Support PhD students from developing countries to conduct research on climate change mitigation in agriculture and quantification of agricultural greenhouse gases
- Foster a network of young professionals
- Improve data on mitigation and emissions to reduce the impact of agriculture on the climate



So far:

- four rounds
- 124 PhD students
- from 32 countries
- based in 50 different institutes
- from 30 different countries.



RESEARCH PROGRAM ON
Climate Change,
Agriculture and
Food Security



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Benefits:

- Early career scientist capability
- New institutional links
- Alumni networks
- Strengthened GRA membership
- New research ideas



AARHUS UNIVERSITET

CONFERENCE SIDE EVENT DAY TWO

28th October 2021 14:00-17:15 EAT

Theme

Delivering Research and Innovations in Agricultural Greenhouse Gases

SPEAKERS



Prof. Daouda Kone
Director of the Capacity
Building Department
WASCAL



Prof. Franke Angelinus
Head of Department, Faculty
of Natural and Agricultural
Sciences
University of the Free State



Dr. Paul I Mukwaya
Senior Lecturer
Makerere University



Prof. Isa Kabenge
Head of Department,
Agricultural and Bio-System
Engineering
Makerere University



Prof. Dossa Luc Hippolyte
Faculté des Sciences Agronomiques
University of Abomey-Calavi



Dr. Caroline Wambui
Senior Lecturer
Maseno University



Dr. Constantine Katongole
Senior Lecturer
Makerere University



Dr. Frank Masese
Senior Lecturer
University of Eldoret



Dr. Pascaline Ciza Azine
Senior Lecturer
Evangelical University in
Africa



Dr. Paulo Salgado
Agronomic research
For the development,
Montpellier (CIRAD)



Dr. El Hadji Traoré
Head of CaSECS
Senegal



CHAIR
Ms. Selma N. Nghituwamhata
Technical Specialist,
Research and Innovation
RUFORUM

 **Register Here** <https://bit.ly/3ijYybg>

 #AfricaHEWeek2021

Co-Organisers:



Angelinus Franke	University of the Free State	South Africa	Can pastoral grazing systems contribute to climate change mitigation? Gathering evidence and exploring future scenario's in the Grassland Biome of South Africa
Frank Masese	University of Eldoret	Kenya	Greenhouse Gas Emissions, Soil Carbon Stocks and Livestock Watering Points in Agropastoral Rangelands of Taita Taveta Hills, Kenya (GRESOL)
Dossa Luc Hippolyte	University of Abomey Calavi	Benin	Relationship between cattle voluntary feed intake on pasture and enteric methane emission in the Sudanian zone of West Africa
Mwanjalolo J.G. Majaliwa	Makerere University	Uganda	Effects of changes in Land Use/Cover and Climate on Carbon Stocks in selected Agro-Ecological Zones of Uganda
Constantine Katongole	Makerere University	Uganda	Developing equations for predicting feed intake by pastoral/agro-pastoral livestock: tackling uncertainty in Uganda's national enteric methane emissions inventory
Isa Kabenge	Makerere University	Uganda	Machine learning for estimating sources and sinks: Developing cloud computing-based, artificially intelligent algorithms to quantify livestock and biomass for management of GHG emissions
Ciza Azine	Evangelical University in Africa	DR-Congo	Amélioration de la productivité animale par la valorisation des ressources alimentaires locales au Sud Kivu, Est de la République Démocratique du Congo.
Caroline Wambui	Maseno University	Kenya	Capacity building for mitigation of GHG emissions and improved ruminant productivity through efficient feeding and manure management strategies in agro-pastoral systems



FOR MORE INFORMATION

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