LIVESTOCK RESEARCH GROUP
newsletter
GLOBAL RESEARCH ALLIANCE
ON AGRICULTURAL GREENHOUSE GASES

Update from the Co-Chairs

Ciao a tutti!

This newsletter comes to you fresh from the annual Livestock Research Group (LRG) meeting, this year held in Lodi, Italy to coincide with the Milan Expo. The Expo's central theme is "Feeding the Planet: Energy for Life", a concept very close to the LRG's heart. Our sincere thanks to the Italian hosts and those who could join us for this seventh meeting of the LRG – a very well attended event with over 30 countries and organisations represented.

It has been another busy year with many projects beginning to bear fruit. Important breakthroughs have been made in the global search for solutions to reduce enteric methane emissions from livestock. This newsletter covers exciting developments in the work to develop an inhibitor to reduce emissions from enteric fermentation in grazing sheep and cattle. It is very pleasing to present these results – signifying cutting edge research that would not have been possible without the global collaboration that the Alliance inspires. Our six research networks are crucial to this effort and this newsletter also updates you on their progress, including a large joint meeting immediately following the LRG meeting.

The joint LRG/FAO collaboration on global agricultural mitigation potential also steps up a notch this month with the related Climate and Clean Air Coalition (CCAC) project on enteric fermentation due to start and the first of three regional workshops being held. We also had some very constructive conversations with the Global Alliance on Climate Smart Agriculture to exchange information about each other's objectives and strengths and improve our mutual understanding, and held a joint workshop on soil carbon with the Soil Carbon/Nitrogen Group.

Looking ahead to the remainder of 2015, we will present our work to the Global Research Alliance's Council when it meets in September and welcomes the United States as its new Chair. Meanwhile the LRG continues its focus on capability building with new LEARN PhD candidates starting, two training workshop for Asia on measurements and inventories in Thailand, and increasing engagement with CCAFS and their flagship project on low emissions development.

Before we leave you to ruminate on the rest of the newsletter, it is worth drawing your attention to the sixth Greenhouse Gas and Animal Agriculture Conference being held in February 2016 in Melbourne, Australia. We will hold our next LRG meeting immediately following this conference so please make the most of the early bird conference registration, which closes in mid-October.

Enjoy the newsletter and, as always, our thanks for your engagement and active support for the Livestock Research Group.

Harry and Martin

Alliance Council to meet in September 2015

The fifth meeting of the Global Research Alliance's Council will take place from 8-11 September 2015 in Des Moines, Iowa, USA. This meeting will see the Netherlands hand over the role of Council Chair to the US, and important discussions on the development of a long-term strategy for the Alliance will take place. The Council will also receive an update on the work of all the Research Groups, including feedback from the LRG on ways to enhance participation. The co-chairs will meet as usual before the Council meeting to discuss common issues. If you are interested in the work of the Council, we encourage you to make contact with your country Council representative or the Secretariat: (secretariat@globalresearchalliance.org).

Update from the **Livestock Research Group meeting**

The seventh meeting of the Livestock Research Group took place from 23-24 June 2015 in Lodi, Italy coinciding with Expo Milano 2015 (for more on the Expo, see page 5). The meeting was very well attended with representation from 21 Alliance member countries, six observer countries and a range of invited guests from Italian and international organisations.

The meeting covered a lot of ground – member countries provided updates on domestic developments, progress in the LRG's six research networks was discussed, relationships with other international organisations were explored and in some cases deepened, new opportunities for research collaboration and capacity building were identified, and outreach and promotional materials were reviewed.

Main outcomes

Strengthening the research networks

The research networks continue to be the engine room of the LRG. However, with several major projects coming to an end, there is a need for new initiatives to ensure momentum and profile are maintained. Representation was also discussed with several networks actively seeking more global participation as well as ways to encourage young scientists to join up. Additional funding support to manage networks remains an ongoing concern and the networks were encouraged to continue publicly demonstrating progress and achievements. For individual updates from the network coordinators, see pages 9-12.

Participants at the LRG meeting in Lodi, Italy

Linking with other organisations

There were useful discussions with other international organisations that share similar interests and objectives as the LRG. The meeting heard from the Global Alliance on Climate Smart Agriculture and agreed to increase the exchange of information and understanding, and to identify areas where the goals and objectives of the two organisations most strongly align (see page 3). Strong potential for increased collaboration and joint activities was also identified between the LRG and the low-emissions flagship programme of the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) and the Co-chairs will undertake follow-up work. The European and World Associations of Animal Production (EAAP and WAAP) indicated their willingness to work with and promote the LRG's activities through their well-established communication channels – offers that will particularly help the LRG's research networks engage more widely.

New opportunities for research collaboration and capacity building

Several possibilities were discussed to participate in a second European funding round similar to the earlier FACCE-JPI round that several LRG countries were involved in. In addition, the European Commission also highlighted the 'International Research Consortia' (IRC) model as a potential way for the Alliance to organize its own funding round in future. This approach supports international cooperation in pursuit of common research goals. Under such a model,

The LRG meeting 2015 at Centro Congressi, Lodi, Italy, 23-24 June 2015

tasks and shared costs are agreed between participating countries and then research is funded towards those goals according to countries' domestic funding rules. The co-chairs will develop those opportunities and share additional information as it comes to hand.

The LRG's meeting location in Italy enabled several Mediterranean countries to participate as observers including Greece, Lebanon, Malta, Portugal and Turkey. Discussions focused on the possibility of building a regional momentum similar to that in Latin America and South East Asia. Italy has agreed to champion this issue and reach out to other Mediterranean countries to identify initial areas of mutual interest.

Carbon sequestration was confirmed as an emerging topic of interest to LRG members, as it offers particular opportunities to link the Grasslands Research Network with CCAFS, the Global Agenda for Sustainable Livestock, and the Alliance's own Soil Carbon and Nitrogen Cycling Group. These options were discussed in detail at a soil carbon workshop held immediately following the LRG meeting (for details, see page 4).

Outreach

The LRG's outreach efforts are becoming more important than ever in an increasingly busy marketplace of climate change and agriculture initiatives. The joint LRG and SAI publication on mitigation best practice and emerging options has proved a highly successful venture and LRG members were encouraged to promote the document in their own countries. Translation into Spanish is being explored. A high-level promotional brochure is being developed by the Co-chairs to help the LRG raise awareness of its contribution to livestock emissions research and the different ways that governments and other relevant organisations can engage. The LRG is also collecting case studies from countries on different ways that countries have successfully reduced the emissions intensity of livestock production at local and national scales. The idea is to create a database to help countries learn from each other's experiences and demonstrate opportunities for replicating and up-scaling such measures.

The next meeting of the LRG will be held in Melbourne, Australia, 19-20 February 2016, immediately following the sixth international Greenhouse Gas & Animal Agriculture (GGAA) conference (14-18 February).

Several LRG research networks are planning their internal meetings in the days before the conference.

Please book this into your diary now. More details will be sent towards the end of this year.

Working with the Global Alliance on Climate Smart Agriculture

The LRG meeting in Lodi presented an excellent opportunity to increase mutual understanding between the GRA and the Global Alliance on Climate Smart Agriculture (GACSA). GRA and GACSA have highly complementary but potentially also overlapping objectives and modes of engaging countries, industry, NGOs and farmers to achieve more sustainable and resilient agriculture production to feed a growing global population.

The meeting heard presentations from the two organisations leading the GACSA's Knowledge Action Group (KAG), CCAFS and FAO, about the KAG's longer term objectives and immediate priorities. The discussion focused on areas where expertise and activities from the LRG research networks could inform KAG activities, but also more strategic synergies between the LRG and KAG in the areas of training, capacity building and resourcing for activities.

The meeting also noted that the multi-stakeholder nature of GACSA, including its two additional platforms on investment and enabling environments, could usefully complement the strong and direct links that the GRA provides to governments.

Towards an international research program on soil carbon sequestration and food security

In support of the French government's call for an international research program on soil carbon sequestration (announced at the third Climate Smart Agriculture science conference in March 2015), the LRG and the GRA's Soil Carbon & Nitrogen Cycling Cross-Cutting Group (SCNC) organized a joint meeting to discuss the development of a dedicated GRA research program on soil carbon sequestration and its application to grassland systems.

The meeting took place on 25 June following the LRG meeting in Lodi and was co-chaired by Jean-François Soussana (SCNC), Martin Scholten and Harry Clark, with strong support from the LRG's Grasslands Research Network. It was attended by 27 participants from 11 countries and also included participation from the Alliance's Croplands Group and Inventories & Monitoring Cross-Cutting Group.

The workshop aimed to highlight the technical potential of soil carbon sequestration to reconcile climate action and food security. The ambitious target proposed by the French Government of sequestering annually an additional 0.4% (4 per mil) of the current soil organic carbon stock per year and its applications to grassland systems, and the potential role of the GRA in supporting this goal through a coordinated research programme, was discussed. Challenges for research were then assessed, including uncertainties, technical potential of good practices, upscaling, monitoring and verifying the changes in soil organic carbon stocks. Updates on these topics were provided by the LRG's Grassland Network and by the SCNC, Croplands Group and Inventory & Monitoring Cross-Cutting Group. Opportunities for collaboration with other initiatives were identified, such as the Global Agenda for Sustainable Livestock, CCAFS, the manure management component of the CCAC's Agricultural Initiative, the Global Soil Partnership, the Global Carbon Project, AgMIP, FAO and UNEP. A side event at the 'Our Common Future under Climate Change' science conference took place in Paris on 7 July to further explore these opportunities.

The workshop concluded that an international research program could help with designing national and local action plans on soil C sequestration by providing technical and socio-economic packages of methods, procedures, options and their technical potentials, costs and benefits, while contributing to capacity building. To this end, different steps were identified:

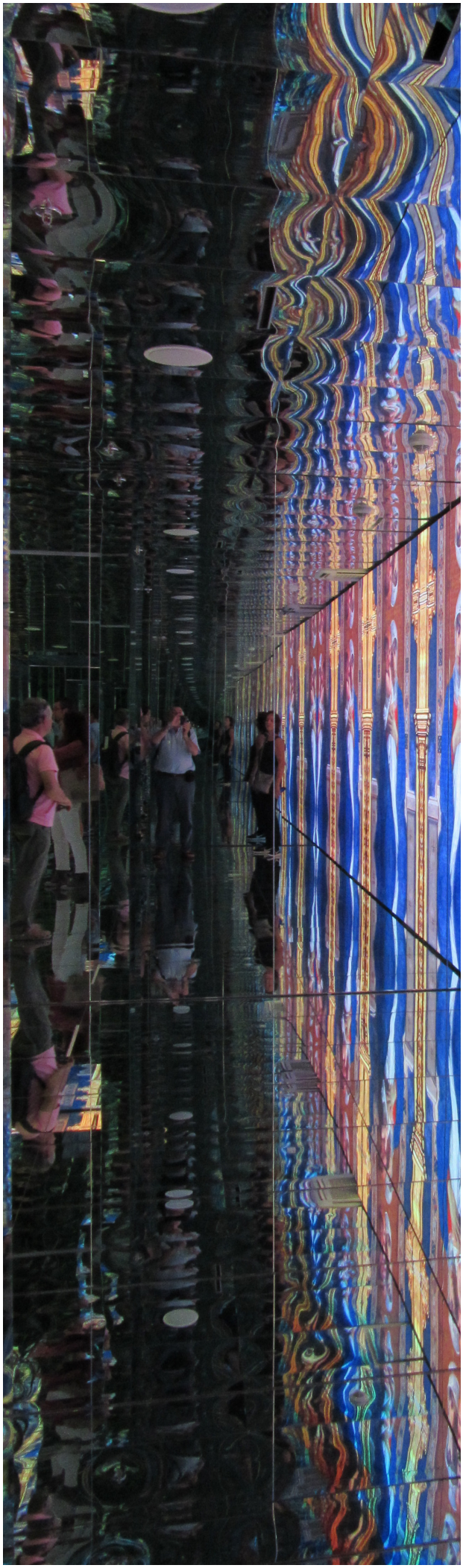
i. Reference databases (assembling and testing site data with grassland/livestock practices to assess impacts on carbon sequestration, plant & animal productivity, GHG balance)

ii. Methods for identifying baseline changes in soil organic C stocks, mapping the potential of good practices, developing abatement cost-curves and indicators

iii. Low cost monitoring, reporting and verification methods with their associated uncertainty with focus on both soil carbon sequestration and stabilization.

Next steps will be discussed during the Research Group Co-chairs teleconferences and at the Alliance Council meeting in September.

For more information on the development of this research program, please contact Jean-François Soussana (Jean-Francois.Soussana@paris.inra.fr).



‘Feeding the Planet: Energy for Life’ at Expo Milano 2015

One day is not enough to visit each of the 96 pavilions overlooking the Decumano (main street) of the Expo Milano 2015 site, where countries from every part of the world are exhibiting their culture, history and – of course – agriculture in response to this year’s theme, “Feeding the Planet: Energy for Life”.

In a single day you can admire the biodiversity of fruits growing in Kazakhstan, learn how the eggs of sturgeons are “milked”, experience a bee’s flight through different British landscapes, taste the best of Italian wines with a sommelier, and sample traditional Argentinean assado.

With over 140 countries sharing their food production traditions and new technologies, the Universal Exposition is a cultural journey that aims to highlight the changes that the entire population of the planet is facing. International organisations and the private sector are also sharing their efforts to assure food security, reduce food waste, mitigate climate change and address air, water and soil pollution, and there are clusters of special exhibitions on rice, cocoa and chocolate, coffee, cereals and tubers, arid zones, spices and more.

As well as showcasing the best of agriculture’s bounty, the theme of the Expo has given rise to a number of meetings of direct relevance to the LRG. On 25 June the Swiss hosted a workshop to explore synergies between three international livestock related initiatives - the LRG, the Global Agenda for Sustainable Livestock (GASL) and the Global Alliance for Climate Smart Agriculture (GACSA). Martin Scholten represented the LRG in an interesting discussion that highlighted the special attributes of each organisation but also the potential for collaboration and the need to avoid duplication. With its focus on scientific research, the LRG is uniquely placed to develop the knowledge base for mitigating and adapting to climate change through livestock. As “multi-stakeholder platforms” both GACSA and GASL can play a role in bringing different groups together to implement research outcomes through partnerships and collaboration, and also to bring in critical dimensions such as investment and policy support. The day after the Swiss event, the French Pavilion hosted a meeting on the contribution of livestock to food security and nutrition. The Expo also brought the World Farmers Organisation (WFO) to Milan for their Annual General Assembly on 24-26 June. The partnership between the GRA and WFO ensured the work of the GRA was featured with New Zealand Federated Farmers President William Rolleston talking about the role that GRA is playing in reducing the intensity of greenhouse gas emissions through improvements in livestock productivity and specific research into the microbiology of the rumen.

There will be many other such events taking place throughout the remainder of the Expo, which runs until 31 October 2015. **More information can be found online at** www.expo2015.org

EXPO MILANO 2015

Significant step towards reducing methane emissions from livestock

An important breakthrough has been made in the global search for solutions to reduce emissions from livestock. New Zealand scientists have identified five compounds that significantly reduced enteric methane emissions in sheep fed a grass-based diet in initial short-term trials, providing a potential technology that could significantly reduce agricultural greenhouse gas emissions.

The project leader Dr Peter Janssen, who coordinates New Zealand's methane research programme, says the findings are the culmination of five years of work during which the team screened more than 100,000 compounds through computer-based searches and in laboratory experiments. The screening process identified five compounds that have now been tested successfully in sheep and resulted in reductions of methane emissions from 30% to more than 90% over a two-day period.

The rumen is the first and largest part of the multi-chambered stomach of grass-eating ruminant animals, including sheep and cattle. It acts as a fermentation vat where microbes break down the cellulose in the plant material to make it digestible. One group of rumen microbes, the methanogens, takes up surplus hydrogen and produce methane.

The team made use of genetic information that became available when the first complete genome of a methanogen was published in 2010. Of the roughly 500 known genes, the team focused on finding compounds that would inhibit the function of those that are known to be involved in the production of methane. Screening thousands of potential compounds in the laboratory and then testing the most promising inhibitors in sealed containers of real rumen fluid meant the discovery process could be dramatically scaled up. Each of the five compounds had to pass toxicity tests before they could be tested in sheep in respiration chambers where changes in methane emissions as well as feed intake could be precisely monitored.

"The intention is to only hit the methanogens," says Peter Janssen. "The nice thing about the way the programme is structured is that the last major test before the compounds go into the animal is to test them in rumen contents that have been taken from an animal. If it has a general impact on other microbes in the system, then you see that the whole fermentation shuts down. If it's only affecting the methanogens then you see that the fermentation continues just like normal, and it's only the methane part that is affected. If it then passes subsequent toxicity testing then we know we can safely try it in an animal."

It is early days for the results with further and larger-scale trials needed to test if the inhibition effect lasts long-term, whether there any effects on productivity, and to make sure there are no residues in meat or milk. The team aims to have a farm-scale product available in five years and is optimistic that this can be achieved given these exciting early results.

New Zealand scientists leading the work to develop a methane inhibitor: Ron Ronimus, Stefan Muetzel and Peter Janssen

Collaborating on global agricultural mitigation potential: an update on progress

In the last LRG newsletter we reported on the new collaboration between the Food and Agriculture Organization of the United Nations (FAO) and the LRG to better quantify global agricultural mitigation potential and identify opportunities for regionally appropriate interventions that support livelihoods, food security and reduce emissions intensity.

The project started in February 2015 when Victoria Hatton (NZAGRC) moved to the FAO in Rome to take up the position of Project Activity Coordinator and has been proceeding until now with funding from the New Zealand Government.

On 1 July, the project received a significant further boost through a successful project supported by the Agriculture Initiative of the Climate and Clean Air Coalition (CCAC). Support from the CCAC will take the project to the next level by developing intervention packages that are tested and critiqued by local experts. This will critically rely on the LRG's extensive research networks as well as FAO technical support and experience in promoting agricultural practices to enhance food security and improve farmer livelihoods. Facilitating this kind of practice change on the ground and elevating the issue to national governments is critical to mobilise change.

What has been happening?

The project is initially focusing on three regions: Latin America, East Africa and South Asia. Recently the first of three regional workshops was held. Twenty participants from science, policy and livestock extension services from Argentina, Uruguay and Brazil were kindly hosted in Buenos Aires, Argentina by the Instituto Nacional Tecnolgie Agropecuario (INTA) from the 26-27 May. Uruguay, Argentina and Brazil are globally significant beef producers; representing 31% of global beef production. Of course this is not without its challenges. Indeed there is a large proportion of

Discussions during the workshop at INTA in Argentina in May 2015

people directly and indirectly dependent on livestock. There are many resource constraints, amongst them the competition for limited land with high value crops such as soya bean and grain. In addition to these there are climate change impacts on water availability and pasture quality, which in turn lead to low productivity of the cattle. However, this also means there are many opportunities for the livestock sector in these countries to develop production systems that increase efficiency and a greater contribution to food security.

The workshop was opened by the INTA president Francisco Angeliso and Jorge Dillon the Under-Secretary for the Ministry for Livestock in Argentina. It brought together scientists, policy makers and extension groups to discuss and identify options for improving cattle production system efficiencies; understanding how the sector can contribute toward incomes, food security goals, and wider economic development. The participants in the workshop also considered the barriers to uptake of existing interventions and started to reflect on how dialogue can be encouraged with a broader set of stakeholders from the sector to develop intervention strategies that would work.

Next steps

Participants will work collectively within each country to classify the beef production systems in the region and identify the key interventions and currently available or near future best practice for the sector. This information will be modelled by FAO to determine the interventions that can have the biggest impact on the production system efficiencies.

For further information about the project contact Dr Victoria Hatton the project activity coordinator (victoria.hatton@fao.org).

Participants represented the following organisations:

Uruguay: The National Institute of Agricultural Research (INIA), Instituto Plan Agropecuario, the Ministry of Agriculture and Fisheries (MGAP) and the University of Uruguay.

Argentina: INTA, AACREA (Asociación Argentina de Consorcios Regionales de Experimentación Agrícola), AAPA (Argentine Animal Production Association), National University of the Province of Buenos Aires, the Instituto de Promocion de la Carne Vacuna Argentina and the Ministry for Livestock and Fisheries.

Brazil: University Federal of Rio Grande Sul and IMAFLORA.

Project Outline:

The project will develop and disseminate innovative, evidence based intervention options by supporting the identification of opportunities and interventions that result in multiple benefits for ruminant livestock producers including gains in productivity, improved food security and a reduction in enteric fermentation.

The FAO Global Livestock Environmental Accounting Model (GLEAM), will be used to simulate the interaction of opportunities and interventions involved in ruminant livestock production and the environment. Through an iterative process with key regional stakeholders, the data and production systems used in GLEAM will be, if necessary, updated to reflect actual measured conditions/parameters.

The CCAC project is in two phases; phase two funding is contingent on the results of phase one. In phase one we will work with local researchers, policy and farmer extension groups to design the cost-effective suites of practices (technical packages) that can have the biggest impact on production system efficiencies and enteric methane abatement, prior to establishing demonstration sites and replication strategies in phase two.

During phase one, we will work with regional partners to develop the best ways to illustrate the technologies and interventions that are available and being implemented. Certainly we understand already that there are gains being made by implementing small, simple practice changes like fencing, improved water supply for the cattle, and improvements to pasture that enable farmers to intensify their production.

El Trebol feedlot, Argentina

Updates from the Research Networks

Joint meeting of the Research Networks

The LRG's six research networks held a joint workshop at the University of Reading, United Kingdom, on 26th June 2015. The objectives were to improve communication and collaboration amongst the networks and explore interdisciplinary approaches for tackling greenhouse gas emissions from animal agriculture.

Forty-seven participants attended the workshop from 21 countries, representing all six networks. Presentations on each of the networks and scientific presentations made for a very informative morning session and the afternoon breakout discussions addressed the benefits and roadblocks to enhanced collaboration within and between networks and ideas for ways to increase joint activities. The workshop was live-streamed on YouTube and live-tweeted by **@AHGHGN, @RMG_network** and **@METHAGENE**

Members of the six LRG Research Networks at the joint meeting in Reading, UK, in June 2015

Through better collaboration, the networks will increase awareness of, and access to, databases and protocols, will be better placed to explore the whole farm system, and will avoid duplication of effort. Funding was raised as a barrier to progressing the networks but a number of potential funding routes were identified. Other issues discussed on the day included the need to build stronger links with industry, to create multi-disciplinary research proposals, encourage smaller active groups within the networks, and engage early-career scientists. Participants agreed that this was a productive workshop and they would be keen to attend another that also had greater involvement from PhD students and post-docs. In the meantime better communication between networks needs to be supported (e.g. webinars, sharing newsletters). A full workshop overview is currently being prepared and will be made available on the GRA website.

Animal Health Network

The Animal Health & Greenhouse Gas Emissions Intensity Network held its second annual workshop on 15th March 2015 in the margins of the Climate Smart Agriculture 2015 conference in Montpellier, France. The workshop brought together researchers and funders to exchange information on relevant scientific initiatives with which the Network is developing links.

Participants addressed data needs and potential data sources required to consider the relationship between animal health and GHG emissions intensity, and identified the wide range of expertise required for this, as well as potential research areas and funding sources for the Network. Eighteen participants attended the workshop, representing 11 countries: Colombia, France, Germany, Italy, Nepal, the Netherlands, Norway, Spain, Sri Lanka, UK, and USA.

A key aim of the Network is to bring together the two traditionally separate disciplines of animal health and GHG research. The Network also recognises the importance of engaging with social scientists and economists and is now developing links with NEAT (a network to enhance the use of economics in animal health education, research and policy-making in Europe and beyond). At the March workshop, participants identified that data managers and systems analysts are also required to advance the Network through bringing together data from the different disciplines and making it accessible.

The vision is to create a multi-national network engaging all GRA countries where animal health, GHG and social science research communities work together to address issues relevant to animal health and GHG emissions intensity under concrete funded research programmes. To work towards achieving this in the next year, the Network will be promoted at events such as the Latino American Association of Animal Production (ALPA) Congress (November 2015), it will aim to increase active participation through inviting more researchers to take on a Network Champion role, and will investigate ways to encourage participation by early career scientists. Funding options for a project on 'Targeting animal health interventions to reduce GHG emissions intensities' are currently being pursued and the Network continues to interact with FACCE-JPI and STAR-IDAZ, which provide potential funding routes for future networking activities.

Contact animalhealthnetwork@adas.co.uk for further information.

Animal Health Network participants attending the workshop in Montpelier, France

Animal Selection, Genetics and Genomics Network

Animal breeding that exploits natural animal variation in methane emissions is a mitigation strategy that is cost-effective, permanent, and cumulative. The disadvantage, however, is that it takes time to see progress.

A choice to mate a dam with a certain sire does only shows its effect when the progeny is born and themselves producing. Therefore, animal breeding should go hand in hand with other mitigation strategies. In this way synergies are created with a combination of immediate responses (e.g. because of changes in the diet), and long-term effects (because of improved genetic ability of the animals). In the upcoming months two international, interdisciplinary meetings will be organised by the ASGGN.

2015 has been busy for the ASGGN. The invited review on "Genetic possibilities to reduce enteric methane emissions from ruminants" is now available online as open access: http://dx.doi.org/10.1017/S1751731115000968. The review shows that methane emissions (g/day) are a heritable and repeatable trait. This opens up the opportunity to start breeding for lower emitting animals.

A Working Group on 'Resource Efficiency' was established at a joint meeting with the International Committee on Animal Recording (ICAR) in June 2015. Roel Veerkamp and Yvette de Haas (Wageningen UR) will chair the group. Its main aims are to:

- Provide a forum for collaboration, information exchange and experience sharing on recording and using dry matter intake data, and recording and using methane outputs data, including facilitating research collaboration.
- Maintain, update, promote and extend universal guidelines for recording dry matter intake and methane output in cattle, sheep and goats worldwide.
- Carry out periodic international surveys on recording dry matter intake and methane output in cattle, sheep and goats worldwide.
- Develop a system and standards for data storage and genetic evaluation services that will form the basis of services that ICAR will provide to members of ICAR and their research associates on a user-pays basis.

Work continues on the ASGGN's Adaptation Working Group white paper on livestock systems in developing countries (addressing low quality diets, heat stress, disease resistance, parasitism, resilience etc). The results will be presented at the next ASGGN meeting at the GGAA conference in Australia in February 2016. The ASGGN was one of the organising partners of the recent joint meeting of the LRG's six Research Networks. The main outcome is that an interdisciplinary approach is of additional value to reduce the environmental impact of ruminants. For ASGGN, collaborations with either the Feed and Nutrition and Animal Health Networks, or with Feed and Nutrition and the Rumen Microbial Genomics Networks are most logical. Opportunities to submit joint proposals will be evaluated.

Another full-day symposium will take place at the European Association of Animal Production conference in Warsaw, Poland on 31 August with presentations relating to aspects of "climate smart cattle farming and breeding" (e.g. economics, system approaches) and also animal nutrition and animal genetics.

If you want to learn more about the network, participate in the debates or contribute with data, please contact Yvette de Haas (Yvette.deHaas@wur.nl). More information can also be found at www.asggn.org

Feed and Nutrition Network

The Feed and Nutrition Network (FNN) was established in 2012 and current membership is about 30 countries.

The broad goals of FNN are

- Summarize and evaluate the available data on mitigating GHG emissions from ruminants by nutritional means (current focus is enteric methane);
- Develop sound recommendations on enteric methane mitigation by nutritional means for stakeholders; and
- Identify gaps in knowledge and focus research on priority issues.

Network members are currently working on several projects, including:

- Preparing a review paper on designing, conducting, and interpreting in vitro batch culture experiments to assess methane production in ruminants;
- Preparing a review paper on suitability of current in vivo measurement techniques to meet specific objectives for accurately quantifying enteric methane emissions from ruminants;
- Developing a database of treatment means allowing science-based recommendations of methane mitigation practices to be communicated to stakeholders; and
- Assembling a database of individual animal data for developing robust methane prediction models based on nutritional and animal factors.

The treatment means database is complete and includes over 1,000 observations from published experiments between 1965 and 2015. The individual animals database is work-in-progress and currently includes approximately 3,000 observations from published and unpublished experiments provided by over 30 contributors from around the world. These FNN activities are integrated with a FACCE-JPI-funded project (GLOBAL NETWORK for the development of nutrition-related strategies for mitigation of methane and nitrous oxide emissions from ruminant livestock). This four-year project started in 2014 and involves eight FNN member countries.

FNN held its annual meeting on 25 June in Reading. Participants were informed about activities by member country representatives and ongoing FNN and GLOBAL NETWORK research projects. Collaboration among network members and with other LRG networks was discussed. The FNN will next meet in February 2016 in conjunction with the GGAA conference in Melbourne, Australia.

For more information about the Feed and Nutrition Network, please contact Professor Alex Hristov, Penn State University (anh13@psu.edu).

FNN members at the meeting in Reading, UK in June 2015

Manure Management Network

The Manure Management Network (MMN) is a global forum for scientists focused on reducing greenhouse gas (GHG) emissions (mainly methane and nitrous oxide) from livestock through improvement of manure management.

The MMN, under its previous coordinator Theun Velinga, was instrumental in the launch, in January 2014, of the manure management component of the Climate and Clean Air Coalition. Jonathan Levin took over MMN coordination in 2015 and, following a meeting of the network in June 2015 at Reading University (UK), the scope and goals of the network were defined as follows:

Scope:

- Promote manure as a source of nutrients, energy and soil organic matter.
- Address the challenges of integrating measurements and models across the global scientific community.
- Advocate manure management for improved nutrient use efficiency to reduce GHG emissions and enhance carbon storage.
- To highlight interactions between different stages of manure management (feeding, housing, storage, processing and spreading) and grazing returns.

Goals:

- To exchange research findings, experiences and data in the field of manure management.
- To identify research gaps.
- To provide an evidence base for policy makers, farmers, industry and other stakeholders about enhanced manure nutrient utilization and mitigation potentials.
- To propose appropriate standard experimental protocols for emission factor derivation and assessing mitigation potential.
- Standardised meta-data, units and reporting.

The network is currently working on a compilation of mitigation methods and strategies, on metadata reporting requirements for different GHG sources and on harmonizing protocols for GHG measurements from the different stages of the manure management chain.

New members are encouraged and anyone who is interested should contact Jonathan Levin (levin@supagro.inra.fr).

Grasslands Research Network

The Grassland Research Network (GRN) continues to work on its stocktake of research activities on soil carbon sequestration and GHG emissions from grasslands (first reported in the December 2014 newsletter).

In this continuous process, a regional approach has brought interesting progress in Europe and Latin America. The European region has been working on a manuscript summarizing the assessment of soil C sequestration in European grasslands, while the Latin American region listed 53 projects on grasslands on soil C and GHG emissions.

Scientists from the Latin American region also held a South Cone workshop at INIA in Uruguay in May. Participants came from Argentina, Brazil, Chile and Uruguay and there was also a representative from the FAO's Global Agenda for Sustainable Livestock (GASL).

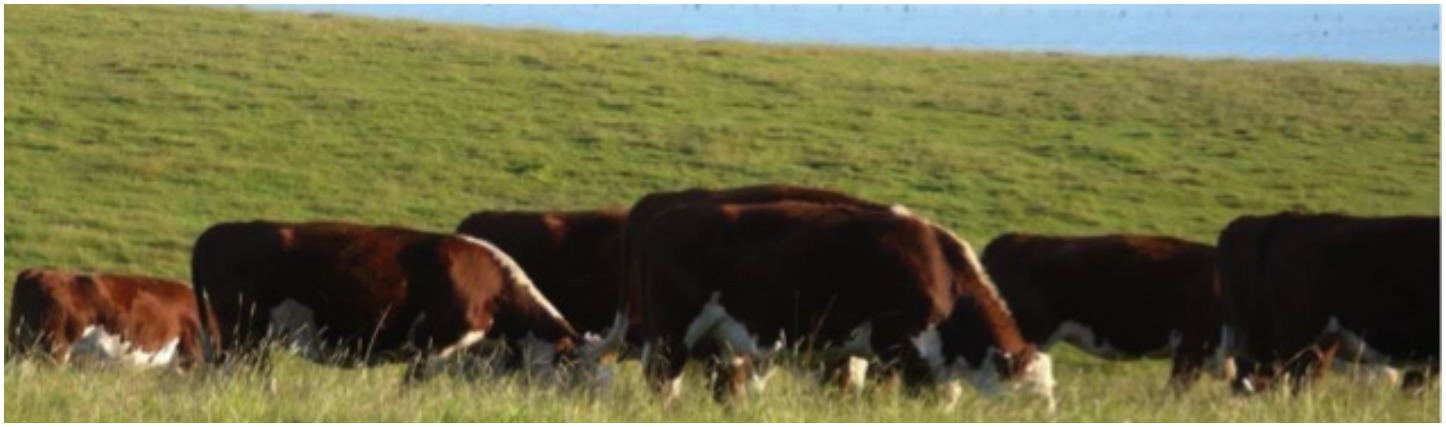
Outcomes of this meeting included:

- Understanding research developments in the South Cone region
- Identification of opportunities for linking the GRN with other networks and the expansion of the GRN contact list.
- Opportunities of collaboration on the report of regional stocktaking and research outcomes in a joint publication, as well as identifying research limitations in the region

An opportunity to collaborate with FAO GASL Focal Area 2: 'Restoring value to grasslands' was discussed at this regional meeting, where the GRN can contribute in the production of a booklet identifying best management practices for grasslands enhancing soil C sequestration and reducing GHG emissions. This project was further discussed at the global level at the joint LRG and Soil C & N Cross-Cutting Group workshop that followed the LRG meeting in Lodi, Italy in June (refer to page 4).

In the next year the GRN will continue working on the stocktake, enhancing collaboration between scientists focusing on the different regional priorities, and engaging more scientists at the global level in particular in the Asian region.

For further information please contact Fernando Lattanzi (flattanzi@inia.org.uy).



LEARN PhD researcher finds ways to help farmers increase nutrient use efficiency when applying farm effluent

Jie Li has finished her LEARN co-funded PhD at New Zealand's AgResearch facilities at Ruakura. We first 'met' Jie in the December 2012 LRG newsletter when she was awarded a LEARN scholarship to investigate potential technologies for reducing greenhouse gas emissions and denitrification nitrogen losses from land application of dairy effluent.

Jie was supervised by Drs Jiafa Luo, David Houlbrooke and Stewart Ledgard from AgResearch and undertook her research in collaboration with Prof Yuanliang Shi's lab at the Chinese Academy of Sciences (CAS) where she previously trained as a researcher.

Jie's research project focused on understanding the extent and seasonal variation of ammonia (NH_3) and nitrous oxide (N_2O) losses from the application of different types of farm effluents to pasture, and evaluating the potential for urease (UI) and nitrification inhibitors (NI) to reduce gaseous N losses from New Zealand pastoral soils. Jie has found that applying different types of effluent to pasture soil led to increased NH_3 volatilization and N_2O emissions. Her study illustrates that UIs and NIs can be effective in mitigating NH_3 and N_2O emissions from land-applied dairy effluents. Results from this study also suggest that strategic application of effluent under dry soil-moisture conditions could potentially reduce N_2O emissions. This project has identified technologies for farmers to increase nutrient use efficiency and to reduce nutrient losses after application of farm effluent or manure.

Through this research Jie has gained knowledge and experience in N_2O and NH_3 emission measurements, use of nitrogen process inhibitors, novel fertilizer development, OVERSEER® nutrient budget model use and other related agricultural and environmental research. Jie has already published several papers in peer-reviewed journals from her PhD study and made several international conference and workshop presentations. The LEARN co-funded PhD programme has also enabled Jie to visit other research centres and universities in New Zealand and facilitated the interaction between institutions.

Jie Li has a strong desire to contribute to science advancement in agricultural greenhouse gas research and apply her knowledge to mitigate nitrous oxide and ammonia emissions from agriculture in China and New Zealand.

Jie Li has started a new job at CAS as a junior scientist. Her research includes understanding N cycling in forage production and cropping systems, evaluation of novel nitrogen process inhibitors, development of new types of fertilizer and nitrous oxide emission factors for effluents and fertilizers. She is taking this opportunity to make full use of what she has learnt in her PhD research work and she is looking forward to having more research collaboration opportunities with other countries.

International Networking Opportunity

Global Research Alliance Senior Scientist (GRASS) Award

Supporting Research in Agricultural Greenhouse Gases

The New Zealand Government has announced funding for senior scientists to participate in an exchange programme to enhance collaboration and the building of mutually beneficial research partnerships between New Zealand and other Global Research Alliance countries.

Focus areas

- Methane emissions from livestock and livestock wastes.
- Nitrous oxide emissions from livestock wastes.
- Enhancement of pastoral soil carbon sinks.
- Integrated whole farming systems impacts at all scales as they relate to livestock emissions.
- National inventory development as it relates to livestock emissions.

Eligibility

To be eligible, you must:

- Have a PhD or be a scientist with at least 5 years experience participating in/ leading major projects that align to the priorities of LEARN, the Alliance or other relevant national strategies.
- Demonstrate impact and leadership in your professional field.
- Be able to contribute to scientific research and its application in your home region and the larger Alliance network, based on your networking record.
- Work in collaboration with a New Zealand research organisation.
- Be resident and normally employed on a permanent contract by a research organisation in an Alliance member country.
- Be fluent in English.

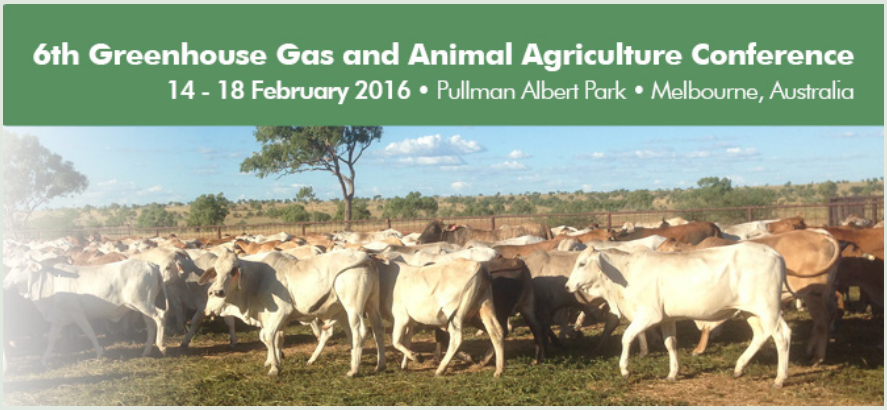
Funding

The exchange must be between 6 weeks and 6 months duration.

- Up to $30,000 for 6 months (pro rata for less than 6 months) will be provided to recipients to cover actual and reasonable living expenses.
- Up to $5,000 will be provided for economy airfares and travel/medical insurance.
- Up to $5,000 will be awarded for associated research costs.

For more details refer to the LEARN Website:
livestockemissions.net **or email** enquiry@nzagrc.org.nz

GGAA2016
Melbourne Australia



6th Greenhouse Gas and Animal Agriculture conference

14-18 February 2016, Australia

Registrations are now open for the sixth GGAA. The conference will feature leading scientists and policymakers who will review the current state of knowledge and present significant new developments and advancements in the measurement, modelling and mitigation of greenhouse gases from animal agriculture.

This includes an opening address from the LRG's own Martin Scholten, speaking on international initiatives in support of agricultural greenhouse gas mitigation.

All registered delegates will have the opportunity to publish their research in a peer reviewed special edition of Animal Production Science, with all abstracts published in the conference proceedings. Attendees of the conference are also encouraged to take part in a number of scientific satellite events and workshops that will precede the main conference.

While the conference is focused on research and associated policy developments it will also be of value to research investors, government policy makers, farm advisers and representatives from the livestock industries.

For more information and to register, please see www.ggaa2016.org

Please note that the next meeting of the Livestock Research Group will take place in Melbourne immediately following the GGAA conference – 19-20 February 2016.

Key dates in the lead-up to the GGAA 2016	
15 July 2015	Call for abstracts closed
1 September 2015	Full paper submissions close
30 September 2015	Authors notified of poster or oral presentation
14 October 2015	Early bird registrations close
13-14 February 2016	Various LRG research network meetings
14-18 February 2016	Conference takes place
19-20 February 2016	Annual LRG meeting

Upcoming events

Technical training programme on livestock methane emissions

A technical training workshop on the production, estimation and mitigation of methane emissions from livestock and related stress and adaptation considerations has been designed for researchers from countries of the South Asian Association for Regional Cooperation (SAARC) and the African Union. This will take place at ICAR, the Indian National Institute of Animal Nutrition and Physiology and combines presentations from national and international experts with practical demonstration.

Date: 11-20 August 2015
Location: ICAR, Bengalaru (formerly Bangalore), India
Email: **Course coordinators**
Dr PK Malik (malikndri@gmail.com)
Dr AP Kolte (atulkolte@yahoo.com)
Dr V Sejian (drsejian@gmail.com)

66th Annual Meeting of the European Federation of Animal Science (EAAP)

The 66th EAAP conference has the theme, 'Innovation in livestock production: from ideas to practice' and brings together livestock and aquaculture scientists as well as policy makers.

Date: 31 August – 4 September 2015
Location: Warsaw University of Life Sciences, Poland
Email: http://eaap2015.syskonf.pl

RuminOmics regional workshop: Improving efficiency of production and reducing environmental impact

The results of the European Union FP7 RuminOmics project will be presented at this workshop including discussing how they can be implemented to derive win-win solutions that benefit both the efficiency of ruminant production in the region and the environment.

Date: 1-2 September 2015
Location: The Westin Warsaw, Poland
Email: http://www.ruminomics.eu/index.php/regional workshop-warsaw/

5th Global Research Alliance Council meeting

Date: 8-11 September 2015
Location: World Food Prize Hall of Laureates, Des Moines, Iowa, USA
Email: secretariat@globalresearchalliance.org

Public Review & Consultation: LEAP Partnership products

The FAO is seeking comment on four LEAP Partnership products:

- Principles for the assessment of livestock impacts on biodiversity
- Environmental performance of large ruminant supply chains: Guidelines for assessment
- LEAP Partnership Life Cycle Assessment Guidelines on Livestock supply chains: Methodological notes
- LEAP database on GHG emissions related to feed crops

Download the consultation document and products and submit by the deadline.

Date: Deadline for comment 15 September 2015
Website: www.fao.org/partnerships/leap/resources/public-review/en/
Email: Livestock-Partnership@fao.org

LRG workshop: improving GHG inventories from livestock in South and South-East Asia

This regional LRG workshop is focused on the benefits of higher tier GHG inventories for livestock systems and the steps needed for invited participating countries to improve their inventories consistent with their national circumstances, priorities and capacities.

Date: 23-25 September 2015
Location: Bangkok, Thailand
Email: laura.kearney@nzagrc.org.nz

3rd LRG technical training course on SF_6 measurement techniques for South and South East Asian countries

Invited participants will receive 'hands-on' training to develop skills in methane emission measurements from ruminants using the SF_6 tracer technique.

Date: 2 – 23 November 2015
Location: Bangkok, Thailand
Email: laura.kearney@nzagrc.org.nz

ALPA 2015: 14th Congress of the Latin American Association of Animal Production

This congress brings together the industrial, productive and scientific sectors to discuss animal production research in Latin America, particularly focusing on the challenges of animal science to sustainably meet increasing food demand.

Date: 9-13 November 2015
Location: Puerto Varas, Chile
Website: www.alpa2015.com

Contacts

GLOBAL RESEARCH ALLIANCE ON AGRICULTURAL GREENHOUSE GASES

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