



WELCOME...

The LRG has been busy during the last few months advancing its ambitious work programme. Several projects that we initiated in 2010 to develop guidelines and initiate research networks have concluded their first phase, and we are reporting on the projects and planned next steps for some of them in the newsletter (see pg 2/3).

Planning has also advanced for the LRG's next meeting on November 4/5 2011 in Amsterdam, which has dual components: a public scientific component and a closed planning meeting. A new international research fund announced recently by the New Zealand government in support of the goals of the Alliance will provide support for the LRG's goals and future work (see pg 4).

The Alliance Council met for its first session in June and confirmed the current working structure of the Alliance through its three Research and two Cross-Cutting Groups. Both Brazil and China have now formally joined the Alliance and we would like to take the opportunity to officially welcome them to the LRG.

We look forward to seeing many of you in Amsterdam in November.

Martin and Harry

Livestock Research Group Meeting

Amsterdam, the Netherlands
3-5 November 2011

The LRG received a strong response to the call for abstracts issued earlier this year in conjunction with the 6th International Symposium on Non-CO₂ Greenhouse Gases (NCGG-6; www.ncgg.info).

After some deliberation and discussion with the conference organisers, four parallel sessions with 20 papers have been dedicated to the aims and objectives of the LRG; one session will run during the afternoon of Thursday 3 November and three further sessions will run concurrently on Friday 4 November after plenary presentations outlining the current work of the Alliance and its Livestock Research Group to conference participants.

The presentations selected are from LRG members talking about projects that they agreed to undertake after the Paris meeting in Clermont, Ferrand and Versailles in France or showcase national efforts and strategies to better understand and reduce GHG emissions.

A closed session of the LRG will follow the symposium on the afternoon of Friday 4 continuing throughout Saturday 5 November where more detailed discussions about the work plan and research opportunities within the Livestock Research Group will continue.

Please note that all Livestock Research Group members who wish to attend the parallel or plenary sessions as part of the NCGG-6 (which the co-chairs of the Livestock Research Group strongly support and encourage) need to register at the conference website (www.ncgg.info). A 50% reduced conference fee has been generously offered by the conference organisers for those participants who can only attend on Friday.

For more information about the Livestock Research Group meeting or the NCGG symposium please contact Dr Andy Reisinger at andy.reisinger@nzagrc.org.nz or Dr Jac Meijs at jac.meijs@wur.nl.

Livestock Research Group facilitates global science collaborations

Over the last six months, New Zealand has been host to many international experts who are part of the global scientific community working to mitigate pastoral agricultural GHG emissions.

The New Zealand Government in its support for the goals and objectives of the Global Research Alliance on Agricultural GHG's (the Alliance) has invested NZ\$0.6M in seven projects that promote collaboration and information sharing across the Alliance member countries. Three projects are producing 'best-practice' manuals that

provide expert technical know-how on techniques to measure methane (CH_4) emissions in sheep and cattle (respiration chambers and SF_6 tracers) and nitrous oxide (N_2O) emissions from agricultural soils. Three further projects investigated the practicalities of establishing and providing ongoing support for research networks in the areas of animal change, rumen microbial genomics and rumen microbial ecology. A seventh project will develop, test and validate GreenFeed (TM patent pending), a methodology for measuring ruminant greenhouse gas fluxes, in the New Zealand environment under pastoral grazing conditions.

Four of the projects brought together international experts from across the globe to meet face-to-face in New Zealand and facilitate and strengthen collaboration, and to start new or support existing research networks.

New Zealand Government



Rumen Microbial Genomics Network Workshop

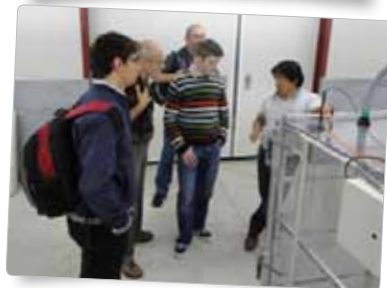
Location: Palmerston North, New Zealand
Date: 25-27 February 2011
Participants: 27 scientists from New Zealand, USA, Argentina, Canada, Australia, Ireland, Japan and the UK.

Science, industry and government were represented at the workshop which heard key note addresses from experts in the rumen microbial genomics (RMG) field and discussions around the practicalities of developing and managing a RMG Network. The Network was endorsed by the participants as an opportunity to deliver new tools for methane mitigation that research groups acting independently would not achieve in their lifetime, but an internationally co-ordinated collaborative approach would allow much more rapid progress. Participants enjoyed the hospitality of AgResearch scientists during their stay.

Next Steps: The Network is now seeking funding for three exciting projects that will leverage off the identified opportunities for enhanced international collaboration to generate data with far-reaching potential.



SF₆ Tracer Technique Workshop



Location: Palmerston North, New Zealand
Date: 8-11 March 2011
Participants: 17 scientists from NZ, Ireland, Argentina, Brazil, Australia and France (and Canada in absentia).

The workshop provided an opportunity to discuss technical aspects of the SF₆ tracer technique as applied to measuring methane emissions from individual ruminant livestock. This was the first step toward preparing a set of guidelines of procedures and protocols for applying that technique.

Next steps: The structure of the guidelines was collectively agreed during the workshop, and chapters of the manual will be jointly authored by participants. It is expected that the guidelines will become pivotal to the widespread successful adoption and application of the technique.

Left: The workshop delegates had an opportunity to visit the newly opened Ruminant Methane Measurement Centre at AgResearch, Palmerston North.

N₂O Chamber Methodologies Workshop

Location: Lincoln, New Zealand
Date: 9-10 May 2011
Participants: 19 participants from NZ, Canada, Australia, the UK, the USA, Denmark and Chile.

The need for internationally agreed guidelines for using chamber methodologies for measuring N₂O emissions from agricultural soils was recognised at a workshop in Banff, Canada in October 2010. The Lincoln workshop provided a chance to meet face-to-face to initiate the development of such guidelines. Participants discussed the current state of understanding about the different aspects of N₂O chamber methodologies, agreed the contents of the guidelines and identified authors. The workshop included a visit to the lysimeter facility and the national N₂O Measurement Centre at Lincoln University.

Next steps: Participants are preparing extended outlines and drafts of the different chapters of the guidelines. It is anticipated that the guidelines will be published later this year.

Some of the delegates also took time after the workshop to visit experimental sites at AgResearch, Lincoln University and Landcare Research.

Enteric CH₄ Mitigation Workshop: animal selection and genomics

Location: Auckland, New Zealand
Date: 16-17 May 2011
Participants: 27 participants from NZ, Australia, France, the UK, the Netherlands, Canada, Brazil and the USA.

The workshop was proposed as the first step to develop a network of researchers involved in efforts to mitigate enteric CH₄ emissions through animal selection, genetics and genomics. World respected scientists, industry experts and policy makers converged on Auckland in mid May to discuss the practicalities of establishing standard protocols for CH₄ mitigation research in the areas of animal selection, genetics, and genomics. Participants listened to presentations about current emissions measurement technologies, DNA sampling techniques, and animal selection methods before debating the potential for pooling information and research to facilitate the development of cheaper measurement methods and suitable proxy measurements.

Next steps: A White Paper is being drafted that envisages an international collaborative approach for enhancing enteric methane mitigation research based on animal selection, breeding and genomics. The next meeting of this network will be in Australia in April 2012.



In the field: GHG emissions mitigation research in Latin America



Dr Veronica Ciganda

FONTAGRO project gets the go-ahead...

The New Zealand Government joined the Inter-American Development Bank and the Regional Fund for Agricultural Technology (FONTAGRO) to support a key start-up project on better understanding the options for mitigation of GHG emissions from agriculture in Latin America and the Caribbean.

Dr Veronica Ciganda from the National Institute of Industry and Agriculture (INIA) of Uruguay will coordinate the project, which will be implemented by a consortium of national research institutions and universities of Latin America (member countries include Argentina, Chile, Colombia, the Dominican Republic and Uruguay). Livestock is an important component of local economies in the region but represents a significant fraction of regional GHG emissions.

The key components of the FONTAGRO project are to:

- Calculate emission factors and quantify enteric CH_4 emissions in grassland production systems for each country

- Evaluate mitigation options for enteric CH_4 based on diets that differ in composition and digestibility and could be influenced by pasture management practices
- Calculate country-specific N_2O emission factors and evaluate N_2O mitigation options through the use of different grass types and soil nitrogen mineralization inhibitors
- Strengthen research capacities on GHG quantification and mitigation in the countries within the consortium.

The project will utilise a range of techniques and technologies including two alternative approaches to measure enteric CH_4 emissions and closed chambers to monitor N_2O fluxes. Capacity building is an integral part of the project through short field and lab courses, recruitment of graduate students and scientific seminars at participant institutions.

The New Zealand Agricultural Greenhouse Gas Research Centre (NZAGRC) will join with the other research institutes from the Latin American and Caribbean region to provide technical support to the project. NZAGRC has a world class research programme delivered

through its nine New Zealand partners, all well known in agriculture research circles. The NZAGRC Director, Dr. Harry Clark says, "we are excited to be working with FONTAGRO and the participating countries and I have high expectations for this project. It will help deliver new and locally relevant knowledge on GHG emissions and build much needed capacity for livestock mitigation research in the region".

Veronica was the first recipient of a New Zealand LEARN Fellowship and spent time in New Zealand in 2008 and is already familiar with New Zealand research efforts and the researchers. Veronica also works with Dr. Clark as co-lead of the Ruminant sub-group of the LRG.

This collaboration between New Zealand, the Inter-American Development Bank and FONTAGRO will contribute to the overall efforts of the Livestock Research Group of the Alliance and is expected to be the start of a broader collaboration between New Zealand and key countries in Latin America and the Caribbean.



Hon Tim Groser, (NZ's Minister for Trade and for International Climate Change Negotiations) sitting with Hayden Montgomery (Alliance Secretariat, NZ) [L-R]. Inset Hon Tim Groser opens the Summit

Update from the Alliance Secretariat

The inaugural Ministerial Summit of the Global Research Alliance on Agricultural Greenhouse Gases took place on Friday 24 June 2011 in Rome, Italy.

The Summit, hosted by New Zealand as the Secretariat, was an opportunity to bring together Ministers and other representatives from Alliance countries to formally launch the Alliance's working phase. This was marked by the signing of the Alliance Charter which acknowledges the frontline role of farmers in addressing the challenges of food security and climate change, and strives to deliver outcomes in this regard. It sets up a framework for country membership and a structure for partners to participate in the Alliance's work. The summit was followed by the inaugural meeting of the Alliance Council, the formal decision-making body of the Alliance.

Thirty three countries were represented at the Summit: Argentina, Australia, Brazil, Canada, Chile, China, Colombia, Costa Rica, Denmark, Finland, France, Germany, Indonesia, Ireland, Italy, Japan, Malaysia, Mexico, the Netherlands, New Zealand, Norway, Peru, the Philippines, Republic of Korea, Russia, Spain, Sweden, Switzerland, Thailand, UK, USA, Uruguay and Vietnam.

The Alliance now has 32 member countries.

Representatives from the countries chairing the Research and Cross-Cutting Groups presented a high-level summary of their work to date and their plans for the future, which were very well received by Ministers and Senior Officials.



Heads of Delegations at the Alliance Ministerial Summit
(reproduced by permission from the Alliance Secretariat)



Erin and Professor Garry Waghorn



The Greenfeed Unit and trailer

First hand experience for the next generation

Animal scientist Erin Garnett is enjoying the opportunity to study for her Master's Degree to develop, test and validate a Greenfeed (™ patent pending) methane measuring system.

Greenfeed is a methodology for ruminant gas flow measurements, for cattle at this stage and it is new to the New Zealand environment. In fact the units at AgResearch are numbers 5 and 6 in the world! It is a trailer-mounted device developed in the US by C-Lock, that will be placed in a paddock and methane production will be measured when cows place their heads in the feeding station. This new technology that has shown excellent results in a feedlot system. The NZ Government funded project, led by Dr Cesar Pinares (AgResearch, New Zealand) and Professor Garry Waghorn (DairyNZ, New Zealand), aims to validate the system for pasture grazing systems.

Working with the project team under the watchful eye of her supervisor Professor Waghorn, Erin will compare the GreenFeed technology to other ruminant methane measurement systems - the respiration chambers and SF₆ Tracer Technique with

6 cows at the AgResearch campus in Palmerston North, New Zealand. The GreenFeed units will then be towed to experimental sites at DairyNZ in Hamilton, New Zealand where she will evaluate the system in a grazing pasture farmlet scenario. This will mostly involve assessing how cows interact with the device as well as measuring their methane emissions, to recommend the most appropriate way that this unit can be used in future grazing experiments.

While not from a farming background Erin is no stranger to agriculture being an animal science and physiology graduate from Massey University. Erin has also previously received a government funded summer studentship to work at AgResearch, Invermay, analysing the causes of pre-natal lamb deaths. Her Masters supervisors are Drs Jennifer Burke (Massey University), David Pacheco (AgResearch) as well as Garry Waghorn.



Dr David Pacheco (AgResearch), Erin Garnett, Patrick and Scott Zimmerman oversee the validation of the Greenfeed Unit



The New Zealand Fund for Global Partnerships in Livestock Emissions Research

New Zealand has established a contestable, international fund worth NZ\$25 million to support research on mitigating greenhouse gas emissions from pastoral farming.

New Zealand Agriculture Minister David Carter announced the New Zealand Fund for Global Partnerships in Livestock Emissions Research at the inaugural ministerial meeting of the Global Research Alliance in Rome on June 24, 2011.

The fund draws on the \$45 million New Zealand committed to the Alliance in 2009, and it will be allocated over four years.

The fund is open to international scientists, and it is hoped that multi-stakeholder/country consortia bids will be put forward. Projects can be led by New Zealand or international participants, but must include a New Zealand partner. A minimum amount of co-funding (cash or in-kind) from international participants will be required.

The fund aims to achieve a balance of projects between innovative science and the achievement of cost-effective and sustainable solutions for livestock farmers in New Zealand and around the world.

There will be a two-step process for assessing proposals. First an international Expression of Interest will be called (late September 2011) and successful applicants will then be invited to submit full proposals.

Updated information will be provided on the Alliance website as the fund processes are developed.

From the Peruvian Andes to the Grasslands field...

to LEARN more about methane measurement techniques

Francisco Franco, born and raised in Cusco, Peru (the ancient capital of the Inca Empire), is a Zootechnist in charge of the La Raya Research Station, a high altitude (4000 m) livestock research centre at the High Altitude Research Institute (IVITA) of San Marcos Major University (UNMSM — the oldest university in Latin America).

La Raya is a well known research centre aiming to improve the small-holder Andean livestock production system. The native Andean livestock species of interest to Francisco and La Raya are the cuyes ('guinea pigs' for most people) and South-American camelids (llamas, alpacas and vicuñas). These species are highly efficient in utilising poor quality forages, but they also have high methane yields.

It is crucial for La Raya to have expertise in measuring methane emissions if they are to take a leading role in research on

climate change mitigation and adaptation within the region. Hence Francisco has been released from his position at La Raya for six months to take the opportunity to work alongside Dr Cesar Pinares-Patino and German Molano and receive training on techniques for measuring methane emissions from herbivores at AgResearch in New Zealand. Funded through a LEARN Work Trainee award Francisco will spend his time immersed in activities concerning measurements of methane emissions using respiration chambers (screening of 1000+ lambs), preparation of animals and gear for



Francisco Franco and German Molano in the New Zealand Ruminant Methane Measurement Centre at AgResearch, Grasslands

estimation of methane emissions from cattle using the SF₆ tracer technique and the newly developed Greenfeed system.

Francisco's career goal is to contribute to the amelioration of environmental effects of livestock farming in the Andes and at the same time to contribute to the improvement of the livelihoods of the Andean poor.



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Livestock Emissions &
Abatement Research Network

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:

<http://www.livestockemissions.net> or

email the New Zealand Agricultural
Greenhouse Gas Research Centre:

LRG-Enquiries@nzagrc.org.nz



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Stock-take work plan update

Members agreed at the first Senior Officials Meeting of the Global Research Alliance in Wellington, New Zealand (April 2010), that it was crucial to develop a collective understanding of individual countries' activities and priorities for agricultural greenhouse gas emissions research.

The volume and quality of the data submitted through the stock-take illustrates the significant research and development effort underway in Alliance countries around the world and represents the foundation for future Alliance collaborations and partnerships.

At the LRG meeting in Versailles in March 2011, consensus was reached that further analysis of the stock-take was needed and lead countries were identified to initiate the agreed work.

New Zealand will continue overseeing the analysis of the stock-take, building on the analysis presented in the March meeting. Updates of the analysis will be presented at the LRG meeting in Amsterdam. The meeting will also provide an opportunity to discuss the scope of the next iteration of the stock-take.

France and the USA will undertake a gaps analysis to identify whether current research efforts matches research needs (for example: why research is less intense in some animal areas than others despite the relative contribution to emissions – buffalo, sheep, and goats). Work will also identify options for capability building and development.

Chile and Uruguay will develop a global mapping of research efforts compared to other data (for example, livestock emissions / animal populations / diversity in production systems / economic value). The outcomes of the analysis will be presented at the LRG meeting in Amsterdam.

New Zealand and the Netherlands are identifying key factors (e.g. feed, housing) and their relationship to agricultural GHG emissions to identify options for mitigation and their interaction with adaptation.

Mexico will identify specific capability needs in the area of GHG emission mitigation in developing countries, building on a recent additional survey conducted within the LRG.

The UK has agreed to undertake further analysis to better understand the differences in project size and project duration, for example why 50% of projects only have funding for 1-2 years. The outcomes of the analysis will be presented at the LRG meeting in Amsterdam.

The Netherlands are using the stock-take data to join up manure management issues and methodologies across both ruminants and non-ruminants sub-groups.

contact us



We are seeking contributions for future Newsletters from members of the Livestock Research Group.

Please send us information about relevant Group activities underway in your country for inclusion in the Newsletter to enquiry@nzagrc.org.nz