

Animal Health and Greenhouse Gas Emissions Intensity Network Summary of Workshops 2013 – 2016

August 2016

These workshops were undertaken by participants of the Animal Health & GHG Emissions Intensity Network to support the objectives of the Global Research Alliance on Agricultural Greenhouse Gases. The information contained within should not be taken to represent the views of the Alliance as a whole or its Partners.

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EXECUTIVE SUMMARY

This report summarises the six workshops that have been held by the Animal Health and Greenhouse Gas (GHG) Emissions Intensity Network (referred to as “the Network” hereafter) over the years 2013 to 2016.

A summary of each workshop is featured within the body of the report and the delegate list and agenda for each workshop are given in the appendices.

Full reports from each workshop can be accessed at - <http://globalresearchalliance.org/dashboard/animal-health-and-ghg-emissions-intensity-network/>

LIST OF ABBREVIATIONS

| | |
|-----------|--|
| AH | Animal Health |
| CCAFS | Research programme on Climate Change, Agriculture and Foods Security |
| COST | European Cooperation in Science and Technology |
| CSA | Climate Smart Agriculture |
| Defra | UK Government Department for Environment, Food and Rural Affairs |
| EI | Emissions Intensity |
| ERA-NET | European Research Area Net |
| FACCE-JPI | Agriculture, Food Security and Climate Change Joint Programming Initiative |
| FAO | Food & Agriculture Organisation of the United Nations |
| GASL | Global Agenda for Sustainable Livestock |
| GHG | Greenhouse Gas |
| GMO | Genetically Modified Organism |
| GRA | Global Research Alliance on agricultural greenhouse gases |
| ILRI | International Livestock Research Institute |
| LRG | Livestock Research Group |
| MACSUR | Modelling European Agriculture with Climate Change for Food Security |
| NEAT | Networking to enhance the use of economics in animal health education, research and policy-making in Europe and beyond |
| SRUC | Scotland’s Rural College |
| STAR-IDAZ | Global Strategic Alliances for the Coordination of Research on the Major Infectious Diseases of Animals and Zoonoses |
| SVEPM | Society for Veterinary Epidemiology and Preventive Medicine |
| UK | United Kingdom |
| USA | United States of America |

1 NETWORK BACKGROUND

The Animal Health and Greenhouse Gas (GHG) Emissions Intensity Network (referred to as “the Network” hereafter) is a United Kingdom (UK) led initiative of the Livestock Research Group (LRG) of the Global Research Alliance (GRA) on Agricultural Greenhouse Gases.

The Network was initiated as there is a broad consensus amongst experts and stakeholders that the GHG emissions intensity from livestock farming can be reduced through efficiency and production gains resulting from improved livestock health. The aim of the Network is to bring together relevant scientists/researchers from across the world to investigate links and synergies between efforts to reduce livestock disease and GHG emissions intensity reductions. This offers multiple win-win opportunities across a diversity of countries and the GRA provides an excellent platform for researchers to engage with one another. There are significant bodies of current research in work areas relevant to the Network and therefore opportunities for interested researchers to collaborate and for research funders to co-ordinate their efforts.

The Network aims to maintain and enhance capacity in the cross-cutting field of animal health and GHG research, facilitate interaction of practitioners, and encourage sharing of information on current and planned activities, so as to avoid duplication of effort, identify evidence gaps and help focus and prioritise research efforts. The work of the Network has the potential to provide real benefits to farmer livelihoods and food security.

Further information on the background to the Network, its objectives, value and evidence gaps is provided in the Network proposal which is available at <http://globalresearchalliance.org/wp-content/uploads/2015/09/20121017-Animal-Health-and-Greenhouse-Gas-Emissions-Network-Proposal.pdf>

Further information is also available on the Network webpages at <http://globalresearchalliance.org/dashboard/animal-health-and-ghg-emissions-intensity-network/>.

2 SUMMARY AND OUTCOMES: NETWORK WORKSHOPS (2013 – 2016)

The Network has gathered momentum since its inception in June 2013. With this membership has increased, from 18 researchers who participated in an initial conference call in September 2013 to having 113 members across 30 countries in June 2016. Engagement from the research community has largely increased through active promotion to coincide with events hosted by the Network or Network participation at targeted conferences.

The aim of the following report is to summarise the workshops held by the Network over the period between 2013 and 2016.

2.1 2014 – Annual Workshop 1: Dublin, Ireland

The first Network workshop was held on the 25th March 2014 at Dublin Castle, Ireland in the margins of the Society for Veterinary Epidemiology and Preventive Medicine (SVEPM) conference (www.svepm.org.uk). This international workshop brought together researchers in animal health, veterinary science, GHG research and other relevant fields. The workshop was attended by 21 participants from six GRA member countries: the Netherlands, Vietnam, France, Mexico, Ireland and the United Kingdom and from non-GRA country Kenya (see Appendix 1 for the list of participants). The workshop agenda is provided in Appendix 2.

The workshop was chaired by the Lead Network Co-ordinator John Tayleur of the UK Government Department for Environment, Food and Rural Affairs (Defra) with support from Joint Network Co-ordinator, Tim Robinson of the International Livestock Research Institute (ILRI). The discussion sessions were facilitated by Professor Brian Perry (Independent Consultant).

The workshop achieved the following outcomes:

- Introduction to the Network.
- Subject-relevant presentations by representatives from ILRI, the Food and Agriculture Organisation of the United Nations (FAO), Scotland's Rural College (SRUC), ADAS UK Ltd and the Joint Programming Initiative on Agriculture, Food Security and Climate Change (FACCE-JPI).
- Panel discussion to address the question of whether animal health improvements will have a significant impact on reducing GHG emissions intensities.
- Agreement on Network statements and specific Network objectives.
- Identification of an initial work area.
- Exploration of funding sources, particularly for enabling participation and promotion.

The Network workshop provided an excellent opportunity for delegates to get to know one another and to learn about the variety of research taking place in this field.

A background to the development of the Network was presented as well as information on the GRA and relevant global initiatives; the Agriculture, Food Security and Climate Change Joint Programming Initiative (FACCE-JPI) and the Global Strategic Alliances for the Co-ordination of Research on Major Infectious Diseases of Animals and Zoonosis (STAR-IDAZ).

The discussion sessions identified that increased GHG emissions intensity through animal disease is a global problem but regional differences in livestock systems and mitigation potential need to be considered. The workshop identified that factors other than animal health need to be taken into account when looking at GHG emissions intensity. Key Network objectives were defined and include integrating with FAO and FACCE-JPI, linking up where necessary with other GRA networks, and working towards improving accuracy and availability of data. Participants considered that the greatest benefit of the Network will be seen in developing countries. The spheres of influence to the Network, potential funding sources and an initial work area were identified.

2.2 2014 – Regional Workshop: Addis Ababa, Ethiopia

The regional meeting of the Network was held on the 5th November 2014 at Hilton Hotel, Addis Ababa, Ethiopia in the margins of the ILRI@40 celebrations (<http://www.ilri.org/node/39048>). This international workshop brought together researchers in animal health, GHG research and other relevant fields. The workshop was attended by 19 participants (see Appendix 3 for the list of participants). The workshop agenda is provided in Appendix 4.

The workshop was chaired by the Joint Network Co-ordinator, Tim Robinson of the International Livestock Research Institute (ILRI).

The workshop achieved the following outcomes:

- Introduction to the Network.
- Subject-relevant presentations by representatives from ILRI, Scotland's Rural College (SRUC), University of Bristol and the Norwegian University of Life Sciences.
- Discussion on how to increase the focus of animal health researchers onto GHG mitigation measures.
- Exploration of potential funding sources.

An introduction and overview of the Network was presented by Tim Robinson, Joint Network Coordinator (ILRI). Technical presentations were provided by Delia Grace (ILRI) – *Burden of animal disease in Africa*, Michael MacLeod (SRUC) – *GHG abatement potential of removing trypanosomosis*, Mark Eisler (University of Bristol) – *Steps to sustainable livestock and the Global Farm Platform* and Şeyda Özkan (Norwegian University of Life Sciences) – *The relationship between subclinical mastitis and emissions intensity in dairy cows*.

The workshop included two open discussion sessions. One was titled '*Current research, research gaps and implications*' and focused on whether animal health researchers took GHG emissions into consideration and whether animal health impacts on emissions were significant. The second session was titled '*Funding opportunities and identification of co-benefits*' and concluded that making links with other projects was the best way of using existing data and funding streams.

The next steps for the Network were to:

- Engage more with the epidemiological community;
- Keep regular contact with FACCE-JPI to avoid duplication of effort and pursue funding opportunities;
- Share information and discuss relevant topics with Network members through an online portal; and
- Source funds for project work and conduct a global scoping study to identify major risks and opportunities for mitigation.

2.3 2015 – Annual Workshop 2: Montpellier, France

The second annual Network workshop was held on the 15th March 2015 at Crowne Plaza Hotel, Montpellier, France, in the margins of the Conference on Climate-Smart Agriculture (CSA) 2015 (<http://csa2015.cirad.fr/>). This international workshop brought together researchers in animal health, veterinary science, GHG research, social science and economics, amongst other fields. It was attended by 18 participants representing 11 countries: Colombia, France, Germany, Italy, Nepal, the Netherlands, Norway, Spain, Sri Lanka, UK, and USA (see Appendix 5 for the list of participants). The workshop agenda is provided in Appendix 6.

- The workshop objectives were to:
- Bring together researchers from different disciplines;
- Discuss Network activities and objectives; share information on existing research and generate ideas for future collaborative work;
- Discuss links between the Network and other relevant initiatives; and,
- Identify data needs and expertise required to address the issue of Animal Health and GHG emissions intensity.

The workshop was chaired by the Lead Network Co-ordinator Professor Ilias Kyriazakis (Newcastle University, UK) and discussion sessions were facilitated by Professor Alistair Stott (SRUC, UK) and Mike Roper (UK Government Department for Environment, Food and Rural Affairs (Defra)). The workshop provided an excellent opportunity for delegates to get to know one another and to share relevant research via presentations and discussions. The workshop enabled further development of links between the Network and related initiatives: the Global Network for Animal Disease Research (STAR-IDAZ), the Agriculture, Food Security and Climate Change Joint Programming Initiative (FACCE-JPI), Modelling European Agriculture with Climate Change for Food Security (MACSUR), Networking to enhance the use of economics in animal health education, research and policy-making in Europe and beyond (NEAT) and the Global Agenda for Sustainable Livestock (GASL). A morning session was dedicated to presentations from these initiatives, which included the identification of potential opportunities for collaboration. The workshop also involved dedicated discussion sessions where participants addressed the important question of what data and expertise are required to address the issue of animal health and GHG emissions intensity and to progress the Network.

The workshop achieved the following outcomes:

- Update on Network activities and progress since the 2014 annual workshop;
- Scientific presentations by researchers from Norway, UK and the Netherlands;
- Further developed links with STAR-IDAZ, FACCE-JPI, MACSUR, NEAT and GASL and identified potential collaborative opportunities;
- Identified data sources and key considerations in relation to ? data needs;
- Identified expertise and research disciplines required for the Network;
- Suggested potential work areas and funding sources for the Network.

Figure 1 shows the wide range of expertise relevant to the Network that were identified during the discussion. It was concluded that the Network needs to attract researchers from these disciplines and that participation of leading researchers in each discipline will be key to the progress of the Network.

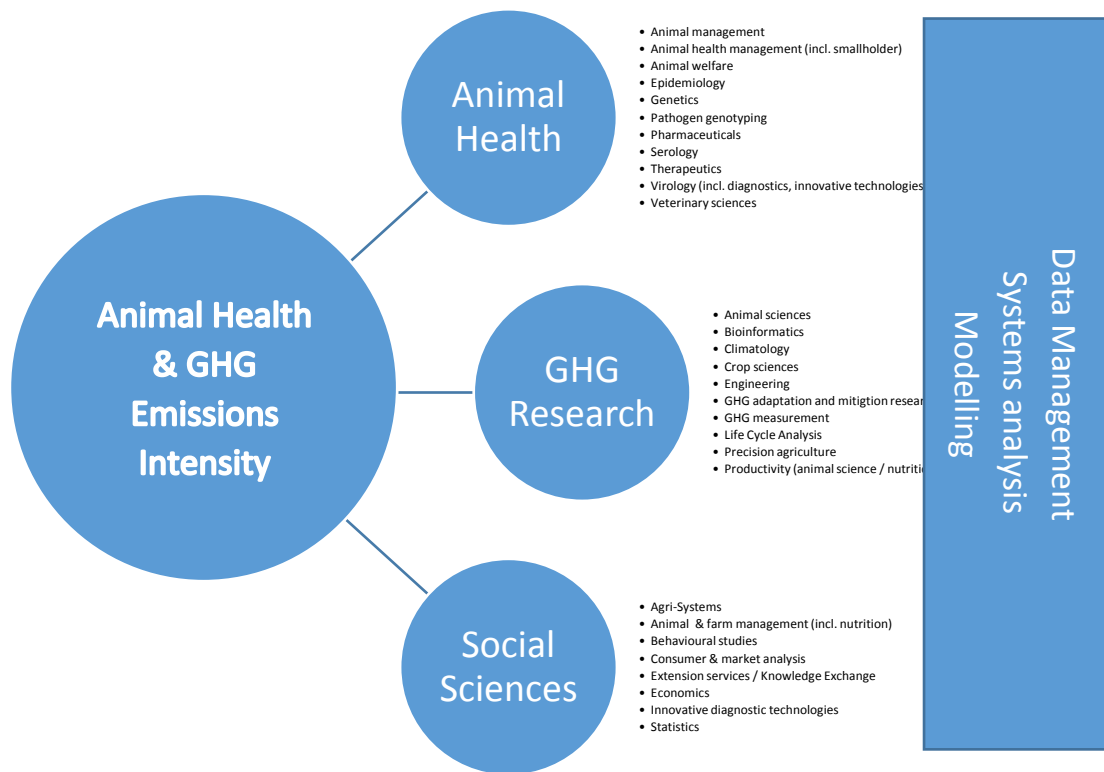


Figure 1: Research areas relevant to the Network

Further comments regarding the identified disciplines in Figure 1 are given below.

Animal health: Genetics includes animal breeding programmes specific to disease resistance. Diagnostics includes mapping genotypes of disease patterns and novel diagnostics e.g. based on animal behaviour. New innovative technologies includes technologies that assist measurement and monitoring.

GHG research (mitigation/adaptation): Crop science is needed to look at impacts on yields and feed availability. Climatology is required particularly with regard to adaptation. Engineering (such as improved bedding and housing or keeping well managed herds in a controlled environment) may be needed from a GHG mitigation perspective but the animal welfare and social perspective issues need considering. Any such activities would need to be accepted by the consumer, as would use of Genetically Modified Organisms (GMO), antibiotics etc.

Social science: Behavioural studies are needed to communicate messages to farmers and enable behaviour change. Behavioural issues should include effects of temperature, wind and precipitation on plants and animals. Economics expertise should include food chain economists and market analysts, and there is a need to consider consumer responses and acceptability of actions. Economic development is needed to improve animal health, and animal health improvements should have a positive impact on farm economics.

The Network needs to identify areas where it can provide benefit and then approach the people with the appropriate expertise.

A summary of actions and Network activities is given in Appendix 7.

2.4 2015 - Joint Workshop of the Animal Health & GHG Emissions Intensity Network (AHN) and Modelling European Agriculture with Climate Change and Food Security (MACSUR): Reading, United Kingdom

This international workshop was held on the 25th June 2015 at the University of Reading, England. It brought together researchers from the AHN and MACSUR and was attended by 26 participants representing 11 countries: UK, Norway, the Netherlands, Ireland, Kenya, Colombia, Switzerland, Spain, Belgium, Austria and Italy. (Delegate list and agenda given in Appendix 8 and 9 respectively).

The aim of the workshop was to further develop links between AHN and MACSUR and provide an opportunity to contribute to high quality papers that will help set the research agenda in this field. The objectives for the workshop were to:

- Share and compare research priorities in order to identify activities and practical plans for the next two years;
- Identify how to make the best use of the resources we have and prevent overlap;
- Identify complimentary areas;
- Determine which topic areas have potential funding opportunities and benefits for the two groups; and
- Consider engagement with other initiatives.

The workshop was co-chaired by two AHN Co-ordinators, Professor Ilias Kyriazakis (Newcastle University, UK) and Dr Tim Robinson (ILRI, Kenya), and Dr Richard Kipling (Aberystwyth University, UK) and Dr Şeyda Özkan (Norwegian University of Life Sciences, Norway) from MACSUR. The joint workshop provided an excellent opportunity for delegates to get to know one another and to discuss network aims and commonalities.

The morning session was dedicated to overview presentations from each network and discussions to identify commonalities from each network's research priorities.

Common objectives were identified as:

- *Data quality and access (produce standards and databases, and assess livestock data availability);*
- *Scoping studies on the impacts of disease;*
- *Prioritising experimental research; and,*
- *Interdisciplinary issues (characterise interactions between disease/health/environmental etc.).*

The focus of the afternoon session was group discussions, based on pre-set questions to identify resource within the networks, areas for collaboration, direction of travel and funding opportunities. The participants split into three groups to each explore the following questions.

1. For each research topic, what expertise is there in AHN and MACSUR?
2. In the topics where work is complementary, what practical activities can MACSUR/AHN undertake with the resources available?
3. In the topics where there is duplication (both groups working on the same topic), how can we make best use of resources?
4. Beyond the activities possible with current resources:

- a. In which topic areas can we identify potential funding opportunities for the two groups, and how can they be developed?
- b. In which topic areas can we benefit from engagement with external initiatives/researchers?

A summary of the joint actions and road map is given in Appendix 10.

2.5 2015 – Joint meeting of Livestock Research Groups: Reading, United Kingdom

Research networks of the Livestock Research Group (LRG) of the Global Research Alliance (GRA) on Agricultural Greenhouse Gases held the first joint workshop on the 26th June 2015 at the University of Reading, England. This international workshop brought together researchers from all of the dedicated LRG research Networks and was attended by 52 participants representing 18 countries: Argentina, Belgium, Chile, Colombia, Denmark, Finland, France, Germany, India, Kenya, the Netherlands, Poland, Spain, Sri Lanka, Switzerland, the UK, Uruguay and the USA (see Appendix 11 for participants list).

The objectives for the meeting were to:

- Develop/improve communication and collaboration among GRA LRG Networks; and,
- Explore interdisciplinary approaches for tackling the issue of greenhouse gas (GHG) emissions from animal agriculture: identifying the challenges, looking for synergies, creating collaborative opportunities and defining remaining interdisciplinary questions.

The workshop was chaired by Professor Chris Reynolds who opened the day by thanking the UK Government Department for Environment, Food and Rural Affairs (Defra) for providing funding before handing over to Professor Ian Givens (Director of the University of Reading's Food Production and Quality Research Division) for an introduction. The workshop provided an excellent opportunity for delegates to get to know one another and to discuss network aims and commonalities.

The morning session was dedicated to presentations introducing the networks and scientific presentations from each of the networks. The focus of the afternoon session was on group discussions based on pre-set questions to identify challenges within livestock GHG mitigation research and areas for collaboration. Ideas for sustaining the future of the Networks were proposed. The workshop agenda is provided in Appendix 12.

The pre-set questions were as follows:

1. Identify a major challenge(s) in the area of livestock GHG mitigation research.
2. What can be gained from collaboration between LRG Networks?
3. What are the roadblocks to enhancing collaboration among members within a network?
4. What are the roadblocks to enhancing collaboration among LRG networks?
5. Propose one specific step/action that is likely to increase collaboration among networks.
6. How can the Networks be sustained in the future and are we on a route to survival or a route to extinction?

Feedback from delegates who attended the Joint Networks workshop was that it had been a success and had provided an opportunity to find out about activities of the other Networks. However there was considered to be a need to invite PhD students and Post-Docs to ensure the future of the research

and to bring enthusiasm and drive to the Networks. Future joint workshops would not need to go into as much detail on the network presentations which would give more time for scientific presentations and networking activities. It was agreed that there should be another joint workshop in the future.

2.6 2016 – Annual Workshop 3: Elsinore, Denmark

The third annual Network workshop was held on the 15th March 2016 at Konventum Conference Centre, Elsinore, Denmark, in the margins of the Society for Veterinary Epidemiology and Preventive Medicine (SVEPM) conference (<http://svepm2016.org/>). This international workshop brought together researchers in animal health, veterinary science, GHG research, social science and economics, amongst other fields. It was attended by 21 participants representing 9 countries: Denmark, Finland, Ireland, Kenya, Norway, South Africa, Spain, the Netherlands and the UK (see Appendix 1 for the list of participants). Approximately half of the delegates had attended previous Network meetings.

The workshop objectives were to:

- Report on the activities of the Network during the past year;
- Share current scientific research in this area;
- Progress links with relevant initiatives and identify opportunities for complementary links and co-working projects;
- Discuss funding sources for research into animal health and GHG emissions intensity; and,
- Formulate the next steps for the Network.

The workshop was chaired by the Network Coordinator Dr Tim Robinson (ILRI, Kenya) and discussion sessions were facilitated by Dr Wim Van der Poel (Wageningen University, the Netherlands) and Mr Luke Dalton (UK Government Department for Environment, Food and Rural Affairs (Defra)). The workshop provided an excellent opportunity for delegates to get to know one another and to share relevant research via presentations and discussions. The workshop enabled further development of links between the Network and relevant initiatives: the Global Network for Animal Disease Research (STAR-IDAZ), the Agriculture, Food Security and Climate Change Joint Programming Initiative (FACCE-JPI), Modelling European Agriculture with Climate Change for Food Security (MACSUR) and Networking to enhance the use of economics in animal health education, research and policy-making in Europe and beyond (NEAT). An afternoon session was dedicated to presentations from these initiatives (including identifying potential opportunities for collaboration) whereas the morning presentations focussed on scientific presentations. The workshop also included two dedicated discussion sessions in which participants addressed the important topics of '*Research priorities and knowledge gaps*' and '*Collaboration to benefit research priorities*'.

The list of research priorities and knowledge gaps identified the following:

- Modelling and horizon scanning (link with MACSUR activities);
- The need to gather good quality surveillance data:
 - Through an improvement in data collection and availability
 - Through more information on disease in relation to GHGs
- Estimate the burden of diseases (regionally)

- Aggregate burden and individual burden
- Incorporate socioeconomic drivers into research;
- Carry out a global scoping study of
 - Much can be done with existing information
 - Joint approach from the Network, MACSUR, STAR-IDAZ, CCAFS
- Prioritise diseases
 - Linking networks and international organisations working on prioritisation (potentially overlay priority disease lists)
 - Consideration of economic/productivity, GHG and public health aspects of diseases
 - Considering climate and other drivers (e.g. market drivers).

The workshop achieved the following outcomes:

- Update on Network activities and progress since the 2015 annual workshop;
- Scientific presentations by researchers from SRUC and Cranfield University, UK;
- Further developed links with STAR-IDAZ, FACCE-JPI, MACSUR and NEAT and identified potential collaborative opportunities;
- Suggested potential work areas and funding sources for the Network.

The delegate list from the workshop is provided in Appendix 13 and the agenda is in Appendix 14.

3 CONCLUSIONS AND NEXT STEPS

Throughout the Network activities, it has become apparent that a multidisciplinary approach to the relationship between animal health (AH) and GHG emission intensities (EI) is needed. Thus the involvement of expertise beyond animal health and environmental impact, such as social science and medicine has been beneficial. This has been facilitated, in part, by holding Network activities alongside pre-existing conferences that draw relevant expertise.

Some of the most tangible outputs of the Network have been derived from such collaborations, for example through links and collaboration with MACSUR.

The two priority areas for future research have been identified as:

- Prioritise diseases in terms of their impacts, both to the environment and to animal Health.
- Obtain good quality data, in terms of disease distribution, impact and options for control.

The combination of both these priority areas should enable us to identify where emphasis should be placed and effort directed. The hope is that the GRA will enable the continuation of the Network as a focal point for interaction in the field of AH and GHG EI

APPENDIX 1: ANNUAL WORKSHOP 1: DELEGATE LIST

| Title | Forename | Surname | Research Institute/Organisation | Country |
|-------|----------|------------------|---|-------------|
| Dr | Abdul | Chaudhry | Newcastle University | UK |
| Dr | Johanne | Ellis-Iversen | AHVLA | UK |
| Dr | Pierre | Gerber | FAO | France |
| Dr | Pinder | Gill | Defra | UK |
| Dr | Sergio | Gomez Rosales | National Institute of research in forestry, agriculture and livestock | Mexico |
| Dr | Carlos | Gonzalez Fischer | Compassion in World Farming | UK |
| Mr | John | Goopy | ILRI | Kenya |
| Dr | David | Graham | Animal Health Ireland | Ireland |
| Miss | Adele | Hulin | ADAS UK Ltd | UK |
| Prof. | Illias | Kyriazakis | Newcastle University | UK |
| Dr | Michael | MacLeod | SRUC | UK |
| | Heather | Mckhann | FACCE JPI | France |
| Mr | John | Muldowney | DAFM | Ireland |
| Prof. | Brian | Perry | | Kenya |
| Mr | Hung | Pham | Institute of animal sciences for southern Vietnam | Vietnam |
| Dr | Timothy | Robinson | ILRI | Kenya |
| Prof. | Alistair | Stott | SRUC | UK |
| Mr | John | Tayleur | DEFRA | UK |
| Prof. | Wim | van der Poel | Wageningen University | Netherlands |
| Dr | Eileen | Wall | SRUC | UK |
| Miss | Alice | Willett | ADAS UK Ltd | UK |

APPENDIX 2: ANNUAL WORKSHOP 1: AGENDA

Workshop Information

Agenda

The Workshop will run from 09:15 to 17:00 and details of the sessions are given below.

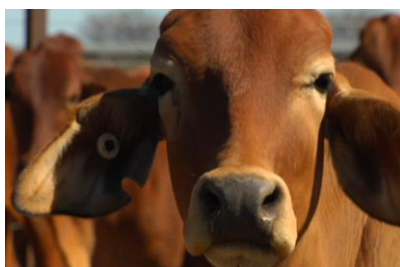
| Time | Item | Chair, Presenters |
|---------------|--|---|
| 09:15 – 09:40 | Welcome and round table for introductions | John Tayleur & Tim Robinson |
| 09:40 – 10:00 | Introduction to the Network and GRA | John Tayleur |
| 10:00 – 11:25 | Short presentations on emerging research work 10 minute presentations with 5 minutes for questions | John Tayleur |
| 10:05 – 10:20 | Animal Health & GHG research | Tim Robinson (ILRI) |
| 10:20 – 10:35 | Background to FAO & GLEAM | Pierre Gerber (FAO) |
| 10:35 – 10:50 | Endemic cattle disease and GHG abatement potential | John Elliott (ADAS) |
| 10:50 – 11:10 | <i>Coffee</i> | |
| 11:10 – 11:25 | GHG emissions intensity and trypanosomiasis | Michael MacLeod (SRUC) |
| 11:25 – 12:55 | Panel discussion: Are animal health improvements going to have a significant impact of reducing GHG's emission intensities? Topics addressed may include: <ul style="list-style-type: none"> • What are the key issues, and where are the real opportunities? • How different are they between developed and developing countries? • What are the trade-offs between improving productivity and reducing GHG? • Who are the key players in research and development? | Chair: Brian Perry Panellists: Eileen Wall, Pierre Gerber, John Goopy, Johanne Ellis-Iverson & Sergio Gómez Rosales |
| 12:55 – 13:10 | Poster Walk | |
| 13:10 – 14:00 | <i>Lunch</i> | |
| 14:00 – 16:00 | Discussion 2: Setting the Network objectives and work areas Topics addressed may include: <ul style="list-style-type: none"> • What is the Network's role in addressing the issues raised in Panel Discussion? • What objectives will address those issues? • What are the potential funding sources? | Brian Perry |
| 16:00 – 16:30 | <i>Coffee</i> | |
| 16:30 – 17:00 | AOB, summary and close | John Tayleur & Tim Robinson |

APPENDIX 3: REGIONAL WORKSHOP: DELEGATE LIST

| Name | Organisation Name | Role/Job Title |
|---------------------|---|---|
| Baba Soumare | African Union Inter African Bureau for Animal Resources (AU-IBAR) | Chief Animal Health Officer |
| Delia Grace | International Livestock Research Institute (ILRI) | Programme Manager |
| Alex Morrow | Department for Environment Food & Rural Affairs (Defra) | Deputy Science Coordinator |
| Luke Dalton | Department for Environment Food & Rural Affairs (Defra) | STAR-IDAZ Project Manager |
| Alaa Marzok | General Organization for Veterinary services Ministry of agriculture and Land Reclamation | Senior Veterinarian |
| Victor Mbao | Centre for Ticks and Tick Borne Diseases (CTTBD) | Programme Manager - Large Ruminant |
| A dugna Tolera | Hawassa University | Professor, Animal Feeds and Nutrition |
| Kurt J. Peters | Humboldt-Universität, Berlin | International Livestock Research Consultant |
| Tim Robinson | International Livestock Research Institute (ILRI) | Principal Scientist |
| John Mutua Mugambi | Kenya Agricultural and Livestock Research Organization | Veterinary Research Centre Director |
| Michel Bellaiche | Kimron Veterinary Institute (KVI) | Director of KVI |
| Noelina Nantima | Ministry Of Agriculture, Animal Industry And Fisheries | Principal Veterinary Officer |
| David Shamaki | National Veterinary Research Institute | Director Research |
| Seyda Özkan | Norwegian University of Life Sciences | Researcher |
| Michael MacLeod | Scotland's Rural College (SRUC) | Climate Change Researcher |
| Halifa Mussa Msami | DELTAVET - Tanzania | Veterinary Research Officer |
| Mark Eisler | University of Bristol | Chair in Global Farm Animal Health |
| Samuel Thevasagayam | Bill & Melinda Gates Foundation | Deputy director, Livestock Initiative |
| Giuliano Cecchi | Food and Agriculture Organisation of the United Nations (FAO) | Project Officer |

APPENDIX 4: REGIONAL WORKSHOP: AGENDA

Animal Health & Greenhouse Gas Emissions Intensity Network Regional Meeting - Africa



5th November 2014
12:30 – 18:30
Hilton Hotel
Addis Ababa
Ethiopia



What will we achieve at the meeting?

- Introduce the Network and its aims
- Encourage awareness and active participation/promotion of the Network (focus on Africa)
- Discuss current research and areas in which research is required
- Understand the key drivers for funding research in Africa and explore how research can be funded
- Understand the importance of GHG/climate change mitigation in Africa and how the Network can help meet this challenge.

Held in the margins of the ILRI@40 celebrations (<http://www.ilri.org/node/39048>) and alongside the STAR-IDAZ (<http://www.star-idaz.net/>) regional meeting.



| Time | Agenda Item |
|---------------|--|
| 12:30 – 14:00 | Lunch |
| 14:00 – 14:30 | Introduction to the Network and GRA and overview of animal health and GHG emissions intensities <ul style="list-style-type: none">◦ <i>Tim Robinson (ILRI, Kenya)</i> |
| 14:30 – 15:30 | Scientific presentations <ul style="list-style-type: none">• Burden of animal disease in Africa<ul style="list-style-type: none">◦ <i>Delia Grace (ILRI, Kenya)</i>• GHG abatement potential of removing trypanosomosis<ul style="list-style-type: none">◦ <i>Michael MacLeod (SRUC, UK)</i> |
| 15:30 – 16:00 | Coffee break |
| 16:00 – 17:00 | Scientific presentations (Cont.) <ul style="list-style-type: none">• Steps to sustainable livestock and the Global Farm Platform<ul style="list-style-type: none">◦ <i>Mark Eisler (University of Bristol, UK)</i>• The relationship between subclinical mastitis and emissions in dairy cows<ul style="list-style-type: none">◦ <i>Şeyda Özkan (Norwegian University of Life Sciences, Norway)</i> |
| 17:00 – 18:00 | Discussion chaired by: Tim Robinson <ol style="list-style-type: none">1. Current research, research gaps and implications2. Funding opportunities and identification of co-benefits |
| 18:00 – 18:30 | Summary and Close <ul style="list-style-type: none">◦ <i>Tim Robinson (ILRI, Kenya)</i> |

APPENDIX 5: ANNUAL WORKSHOP 2: DELEGATE LIST

| Research Institute | Title | Forename | Surname | Research interest/Title/Network role | Country |
|---|-------|-------------|-----------------|---|-----------------|
| Federal Office for Agriculture and Food | Dr | Johannes | Bender | ERA-NET Co-fund on Sustainable Animal Production Coordinator | Germany |
| Defra | Mr | Luke | Dalton | STAR-IDAZ Project Manager | UK |
| University of Ruhuna | Mr | Chandima | Gajaweera | Lecturer – department of Animal Science, Faculty of Agriculture | Sri Lanka |
| ADAS UK Ltd | Ms | Adele | Hulin | Research Scientist, Network Secretariat | UK |
| Royal Veterinary college | Dr | Elizabeth | Jackson | Lecturer in Business | UK |
| Newcastle University | Prof | Ilias | Kyriazakis | Professor of Animal Health and Nutrition, Network Coordinator | UK |
| CORPOICA | Mr | Michael | Lopez Cepeda | Veterinarian, Professional Researcher | Colombia |
| SRUC | Dr | Michael | MacLeod | Researcher | UK (Scotland) |
| Self-Employed | Ms | Wendy Lu | McGill | Research Consultant | USA |
| INRA | Dr | Heather | McKhann | FACCE-JPI Secretariat | France |
| USC/EURAF | Dr | Maria Rosa | Mosquera Losada | Head of Crop Production Department | Spain |
| FAO-AGAL | Dr | Anne | Mottet | Livestock Policy Officer | Italy |
| Norwegian University of Life Sciences | Dr | Şeyda | Özkan | Research Scientist | Norway |
| Defra | Mr | Mike | Roper | Innovative and Sustainable Farming R&D Programme Manager | UK |
| Wageningen University | Dr | Martin | Scholten | Co-chair of GRA Livestock Research Group | The Netherlands |
| HELVETAS Nepal | Mr | Shiva Kumar | Shrestha | Senior Programme Officer | Nepal |
| SRUC | Prof | Alistair | Stott | Group Manager Future Farming Systems Research | UK (Scotland) |
| Wageningen University, Central Veterinary Institute | Dr | Wim | Van der Poel | Research Leader | The Netherlands |

APPENDIX 6: ANNUAL WORKSHOP 2: AGENDA

Workshop Agenda

The workshop supports the Network objectives; to maintain and enhance capacity in the cross-cutting field of animal health and GHG research, facilitate interaction of practitioners from relevant research communities (e.g. animal science, veterinary medicine, epidemiology, GHG's, food security, economics) and encourage sharing of information on current and planned activities, so as to avoid duplication of effort, identify gaps and help focus and prioritise research efforts. For further information on the Network please see the report from the inaugural Network workshop which is available at <http://www.globalresearchalliance.org/updates/2014/animal-health-network-dublin-workshop-report/>.

| Time | Agenda Item | Delegate |
|---------------|---|--|
| 09.30 – 09.40 | Arrive | |
| 09.40 – 09.55 | Welcome and round table for introductions | Ilias Kyriazakis (Network Coordinator, UK) |
| 09.55 – 10.15 | Overview of the Network and recent activities | Ilias Kyriazakis |
| 10.15 – 11.45 | Scientific presentations | |
| 10.15 – 10.35 | A modelling exercise to evaluate the impact of animal health on GHG emissions | Seyda Ozkan (Norway) |
| 10.35 – 10.55 | Quantifying the effects of removing trypanosomosis on West African cattle emissions | Michael Macleod (UK) |
| 10.55 – 11.25 | <i>Tea/Coffee</i> | |
| 11.25 – 11.45 | Emerging diseases in livestock in relation to climate change | Wim van der Poel (The Netherlands) |
| 11.45 – 13.00 | Presentations from initiatives with which the Network is developing links | |
| 11.45 – 12.00 | Global Network for Animal Disease Research (STAR-IDAZ) | Luke Dalton (UK) |
| 12.00 – 12.15 | Agriculture, Food Security and Climate Change Joint Programming Initiative (FACCE-JPI) | Heather McKhann (France) |
| 12.15 – 12.30 | Modelling European Agriculture with Climate Change for Food Security (MACSUR) | Seyda Ozkan |
| 12.30 – 12.45 | Networking to enhance the use of economics in animal health education, research and policy-making in Europe and beyond (NEAT) | Elizabeth Jackson (UK) |
| 12.45 – 13.00 | Global Agenda for Sustainable Livestock (GASL) | Anne Mottet (FAO, Italy) |
| 13.00 – 14.00 | <i>Lunch</i> | |
| 14.00 – 14.45 | Discussion session 1 What data do we need to address the issue of animal health and GHG emissions intensity | Chaired by Alistair Stott (UK) |
| 14.45 – 15.15 | <i>Tea/Coffee</i> | |
| 15.15 – 16.00 | Discussion session 2 What expertise are required to progress the issue of animal health and GHG emissions intensity | Chaired by Mike Roper (UK) |
| 16.00 – 16.30 | AOB, Summary and Close | Ilias Kyriazakis |

APPENDIX 7: ANNUAL WORKSHOP 2: SUMMARY OF ACTIONS AND POTENTIAL NETWORK ACTIVITIES

Summary of actions identified during the workshop

1. Professor Ilias Kyriazakis to share details of papers on economic / carbon costs of epidemics.
2. Dr Anne Mottet to share the outcomes of the GASL meeting for social movement and community based organisations.
3. Mike Roper to share the peer reviewed Defra carbon budget which includes 30 mitigation measures related to animal health.
4. The Network should engage veterinary organisations who would have a business interested in animal health and GHGs. For this relevant contacts are required – Please email any leads to animalhealthnetwork@adas.co.uk.
5. The Network needs to contact and engage with research communities identified in discussion session 2 of the workshop (summarised in Figure 1) and try to make the Network attractive to the various disciplines. Participation of leading researchers in each discipline will be key to the progress of the Network.
6. Link up with AnimalChange (<http://www.animalchange.eu/>).
7. Network members are encouraged to write blogs and share information via NEAT and via the STAR-IDAZ shared login area (contact animalhealthnetwork@adas.co.uk for your individual login ID).
8. Egypt has recently become a member of the GRA and should be contacted to participate in this Network.
9. The animal health/GHG axis should be included in the UK Agri-Tech information centre but the mechanism for incorporation needs further consideration.

Summary of potential Network work areas/activities

1. Assess the economic and carbon costs due to an epidemic resulting from climate change. This is part of the decision making process of policy makers, and effects the amount of effort and costs put into controls.
2. Map the location of key diseases (endemic and exotic) and then relate that back to GHG emissions and identify where gains will be made.
3. Further to the above activity, link epidemiology with activity data to identify where the best returns will be for different countries in terms of reducing GHG emissions.

APPENDIX 8: JOINT WORKSHOP OF AHN AND MACSUR: DELEGATE LIST

| Surname | Forename | Institute |
|---------------|-------------|--|
| Bannink | Andre | Wageningen UR |
| Bartley | Dave | Moredun Research Institute |
| Blanco Penedo | Isabel | IRTA |
| Chaudhry | Abdul | Newcastle University |
| De Haas | Yvette | Wageningen UR Livestock Research |
| Fox | Naomi | Scotland's Rural College |
| Garnsworthy | Phil | University of Nottingham |
| Gill | Pinder | Defra |
| Gredler | Birgit | Qualitas AG |
| Hammami | Hedi | University of Liège |
| Hulin | Adele | ADAS |
| Kipling | Richard | Aberystwyth University |
| Kyriazakis | Ilias | Newcastle University |
| Leclere | David | International Institute for Applied Systems Analysis |
| Lessire | Françoise | Université de Liège |
| Macleod | Michael | Scotland's Rural College |
| Özkan | Şeyda | Norwegian University of Life Sciences |
| Robinson | Tim | ILRI |
| Rodriguez | Jose Luis | Colombian Corporation of Research in Livestock and Agriculture |
| Vanrobays | Marie-Laure | University of Liège |
| Vitali | Andrea | Tuscia University |
| Wheelhouse | Nick | Moredun Research Institute |
| Willett | Alice | ADAS |
| Williams | Adrian | Cranfield University |
| Williams | Hefin | Aberystwyth University |
| Wilson | Anthony | Pirbright Institute |

APPENDIX 9: JOINT WORKSHOP OF AHN AND MACSUR: AGENDA

Workshop Agenda

Thursday 25th June 2015, AHN and MACSUR Joint Meeting

| Time | Agenda Item | Delegate |
|---------------|---|--|
| 09.30 – 09.45 | Introduction and outline of meeting aims | Şeyda Özkan |
| 09.45 – 10.15 | Introductions from each Network AHN MACSUR | Ilias Kyriazakis Richard Kipling |
| 10.15 – 10.30 | <i>Tea/Coffee break</i> | |
| 10.30 – 10.40 | Introduction to research priority session | Richard Kipling |
| 10.40 – 11.05 | MACSUR – Research priorities identified in workshop session (from Wednesday 24 th June) | Şeyda Özkan |
| 11.05 – 11.30 | AHN – Current priorities | Tim Robinson |
| 11.30 – 12.00 | Group discussion to identify common objectives and priorities | Tim Robinson |
| 12.00 – 12.45 | <i>Lunch</i> | |
| 12.45 – 14.00 | Discussion session - based on list of priorities generated in the morning. Break into groups of 10/11 people | Ilias Kyriazakis Anthony Wilson Tim Robinson |
| 14.00 – 15.00 | Feedback session and discussion of differences between group views | Rapporteurs |
| 15.00 – 15.20 | <i>Tea/Coffee break</i> | |
| 15.20 – 15.45 | Identification of actions and roadmap, discuss state-of-the art paper and Close | Ilias Kyriazakis |
| 16.00 – 18.30 | Visit to University of Reading's Centre for Dairy Research | |

For more information please contact:

Alice Willett (ADAS UK Ltd.)

Telephone: 01954 268309

Email: animalhealthnetwork@adas.co.uk



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APPENDIX 10: JOINT WORKSHOP OF AHN AND MACSUR: SUMMARY OF ACTIONS AND ROAD MAP

Actions arising from the meeting that were within current AHN and MACSUR resource:

1. AHN to contribute to the MACSUR State of the Art paper led by Dr Şeyda Özkan, Dr Richard Kipling and Professor Nicola Lacetera.

MACSUR are producing a State of the Art paper on modelling relating to the two topics in question: impacts of climate change on animal health, and impacts of animal health on GHGs. Members of AHN are welcome to contribute to the paper and will receive co-authorship providing a route to create better links between researchers in AHN and MACSUR. The paper aims to describe the current state of modelling and the direction of travel (where we would like to get and how to get there). Key messages from the paper will also be communicated to policy makers in accessible formats (policy briefs etc.).

2. Develop a hierarchy of diseases/health issues contributing to GHGs

This action was discussed during the group sessions. It could look at the most economically important diseases, based on the method used by Professor Phil Garnsworthy (in Garnsworthy, P.C. (2004). The environmental impact of fertility in dairy cows: a modelling approach to predict methane and ammonia emissions. *Animal Feed Science and Technology* 112: 211–223. doi:10.1016/j.anifeedsci.2003.10.011).

An initial scoping study could deliver questionnaires sent to countries, experts and relevant organisations asking about the important animal health issues. Herd models/simulations could be used to devise a filtering system to say which animal health issues would have the biggest impact on GHG. Sensitivity will be different for different systems (sensitivity analysis).

MACSUR can support and complement this activity by surveying modellers to gain an overview of current modelling capacity in relation to the priority health issues identified. Further development (model sensitivity testing etc.) might be possible for some MACSUR partners, or might require external funding.

ACTION: Develop a 2-page concept note on the approach (this is essentially a fast tracked version of the proposed AHN scoping study on 'Targeting animal health interventions to reduce GHG emissions intensities').

3. Apply to a Marie Skłodowska-Curie actions

A Call opens in September with a deadline in January 2016; this is a one stage proposal. Dr Anthony Wilson and MACSUR colleagues are already involved in developing a community of students to share models as part of MACSUR capacity building activities (participants were invited to email Anthony if they were interested in being involved).

ACTION: Dr Anthony Wilson to take this forward and ensure that it involves AHN as well as MACSUR partners.

4. Apply for a COST Action

A requirement of COST is that it supports a new network and is available for new partners to join. Dr Anthony Wilson and Dr Yvette de Haas, who have experience applying for these, offered to support. There is only a relatively small amount of work involved (4-5 page application).

5. Data inventory

The modellers to define data requirements and other participating researchers to identify data and information that is available. MACSUR would provide information on their priorities to support this.

ACTION: Secretariat with support from Network Coordinators to explore potential for additional resource from the UK to deliver this.

APPENDIX 11: JOINT MEETING OF LIVESTOCK RESEARCH GROUPS: DELEGATE LIST

| Forename | Surname | Research institute | Country |
|--------------|-------------|---|------------------|
| Claudia | Arndt | Environmental Defence Fund | Germany |
| José Ignacio | Arroquy | National Agricultural Technology Institute (INTA) | Argentina |
| André | Bannink | Wageningen UR | Netherlands |
| Dave | Bartley | Moredun Research Institute | UK |
| Alireza | Bayat | Natural Resources Institute Finland (Luke) | Finland |
| Raghavendra | Bhatta | National Institute of Animal Nutrition and Physiology (ICAR) | India |
| Abdul | Chaudhry | Newcastle University | UK |
| Adam | Cieslak | Poznań University of Life Sciences | Poland |
| Les | Crompton | Reading University | UK |
| Yvette | de Haas | Wageningen UR | Netherlands |
| Frédéric | Dehareng | CRA-W, Valorisation of Agricultural Products Department | Belgium |
| Richard | Dewhurst | Scotland's Rural College (SRUC) | UK |
| Jan | Dijkstra | Wageningen UR | Netherlands |
| Veerle | Fievez | Ghent University - Lanupro | Belgium |
| Hernando | Florez-Diaz | Colombian Corporation of Agricultural and Livestock Research (CORPOICA) | Colombia |
| Phil | Garnsworthy | University of Nottingham | UK |
| Hedi | Hammani | University of Liège- Gembloux Agro-Bio Tech | Belgium |
| Kirsty | Hammond | Uni of Reading UK/AgResearch NZ | UK & New Zealand |
| Alex | Hristov | Penn State University | USA |
| Pekka | Huhtanen | Swedish University of Agricultural Sciences | Sweden |
| Adele | Hulin | ADAS | UK |
| Sharon | Huws | Aberystwyth University | UK |
| Ermias | Kebreab | UC Davis | USA |
| Björn | Kuhla | Leibniz Institute for Farm Animal Biology (FBN) | Germany |
| Ilias | Kyriazakis | Newcastle University | UK |
| Jonathan | Levin | INRA | France |
| Juliana | Lopes | Penn State University | USA |
| Peter | Lund | Aarhus University, AU Foulum | Denmark |
| Michael | MacLeod | Scotland's Rural College (SRUC) | UK |

| Forename | Surname | Research institute | Country |
|--------------|------------|--|-------------|
| Maguy | Eugene | INRA | France |
| Cécile | Martin | INRA | France |
| Michaël | Mathot | Walloon Agricultural Research Centre CRA-W, Gembloux | Belgium |
| Camila | Muñoz | Instituto de Investigaciones Agropecuarias (INIA Remehue) | Chile |
| Jamie | Newbold | Aberystwyth University | UK |
| Nico | Peiren | Institute for Agricultural and Fisheries Research (ILVO) | Belgium |
| Soren | Peterson | Aarhus University | Denmark |
| Daniel | Rearte | National Agricultural Technology Institute (INTA) | Argentina |
| Chris | Reynolds | Reading University | UK |
| Tim | Robinson | ILRI | Kenya |
| Jose Luis | Rodriguez | Colombian Corporation of Research in Livestock and Agriculture | Colombia |
| Angela | Schwarm | ETH Zurich | Switzerland |
| Thakshala | Seresinhe | University of Ruhuna, Mapalana, Kamburupitiya | Sri Lanka |
| Kevin | Shingfield | Aberystwyth University | UK |
| Ilma | Tapio | Natural Resources Institute Finland (Luke) | Finland |
| Per | Theilgaard | Vitfoss | Denmakr |
| Juan | Tricarico | Innovation Center for U.S. Dairy | USA |
| Marie-Laure | Vanrobays | University of Liège- Gembloux Agro-Bio Tech | Belgium |
| José Ignacio | Velazco | INIA - Treinta y Tres | Uruguay |
| Eileen | Wall | Scotland's Rural College (SRUC) | UK |
| Nick | Wheelhouse | Moredun Research Institute | UK |
| Alice | Willett | ADAS | UK |
| David R. | Yanez-Ruiz | Spanish Council for Scientific Research (CSIC) | Spain |
| Scott | Zimmerman | C-Lock Inc | USA |

APPENDIX 12: JOINT MEETING OF LIVESTOCK RESEARCH GROUPS: AGENDA

| Time | Agenda Item | Delegate |
|---------------|--|---|
| 8.30 – 8.45 | Registration | |
| 8.45 – 9.00 | Welcome | Chris Reynolds |
| 9.00 – 10.20 | Network Presentations, 10 min each (8 min for presentation, 2 min for questions) | <i>Chaired by Chris Reynolds</i> |
| 9.00 – 9.10 | Feed and Nutrition Network (FNN) | Alex Hristov |
| 9.10 – 9.20 | Grassland Research Network (GRN) | José Ignacio Velazco |
| 9.20 – 9.30 | Manure Management Network (MNN) | Jonathan Levin |
| 9.30 – 9.40 | Animal Health Network (AHN) | Ilias Kyriazakis |
| 9.40 – 9.50 | Animal Genetics Networks (ASGGN + METHAGENE) | Yvette de Haas |
| 9.50 – 10.00 | Rumen Microbial Genomics Network (RMG) | Sharon Huws |
| 10.00 – 10.10 | Ruminomics | Kevin Shingfield |
| 10.10 – 10.20 | Pangenome | Phil Vercoe presented by Yvette de Haas |
| 10.20 – 10.30 | Opportunity for discussion | <i>Chaired by Chris Reynolds</i> |
| 10.30 – 11.00 | <i>Tea/coffee break</i> | |
| 11.00 – 13.00 | Scientific presentations, 10 min each (8 min presentation and 2 min for questions) | <i>Chaired by Chris Reynolds</i> |
| 11.00 – 11.10 | Association between metabolic status and CH ₄ production in dairy cows | Björn Kuhla |
| 11.10 – 11.20 | Mitigating enteric methane emissions: impact of nutritional quality of grass herbage and grass silage | Jan Dijkstra |
| 11.20 – 11.30 | Early-life nutritional interventions to reduce CH ₄ emissions | David R. Yanez-Ruiz |
| 11.30 – 11.40 | Variation in methane emissions in large populations of dairy cows | Phil Garnsworthy |
| 11.40 – 11.50 | Comparison of methods to determine methane emissions from dairy cows | Pekka Huhtanen |
| 11.50 – 12.00 | Proxies in the context of COST action 'Methagene' and Overview of FACCE/JPI 'RumenStability' project | Richard Dewhurst |
| 12.00 – 12.10 | Lipogenic and glucogenic compounds: their interaction with rumen metabolism, animal health, product quality and potential as biomarker | Veerle Fievez |
| 12.10 – 12.20 | Use of the milk MIR spectra with a lactation stage specific model to predict CH ₄ emitted by dairy cows | Frédéric Dehareng |

| | | |
|----------------------|--|--------------------------------|
| 12.20 – 12.30 | Investigations into novel pathogens associated with bovine reproductive failure | Nick Wheelhouse |
| 12.30 – 12.40 | Greenhouse Gas emissions and Trypanosomiasis control in East Africa | Tim Robinson |
| 12.40 – 12.50 | Climate change, methane emission and livestock production- Indian perspective | Raghavendra Bhatta |
| 12.50 – 13.00 | Creation of database for meta-analysis | Ermias Kebreab |
| 13.00 – 14.00 | <i>Lunch</i> | |
| 14.00 – 14.45 | Break-out discussion sessions | <i>Chaired by Alex Hristov</i> |
| 14.45 – 15.15 | <i>Tea/Coffee Break</i> | |
| 15.15 – 16.45 | Report by each discussion group (about 5 min), followed by general discussion and overall conclusions | <i>Chaired by Alex Hristov</i> |
| 16.45 – 17.15 | Closing remarks and further steps | Chris Reynolds / Alex Hristov |
| 17.15 | Meeting Adjourned | |

APPENDIX 13: ANNUAL WORKSHOP 3: AGENDA

| Research Institute | Title | Forename | Surname | Research interest/Title/Network role | Country |
|--|-------|----------|------------------|---|-----------------|
| Moredun Research Institute | Dr | Dave | Bartley | Principal Investigator | UK |
| University Of Helsinki | Ms | Paula | Bergman | PhD Student | Finland |
| Welsh Government | Dr | Arjen | Brouwer | Veterinary Adviser | UK |
| Defra | Mr | Luke | Dalton | STAR-IDAZ Project Manager | UK |
| University of Copenhagen | | Anil | Demeli | PhD Student | Denmark |
| SRUC | Dr | Naomi | Fox | Quantitative Ecologist | UK |
| Pretoria University | Dr | Gerhard | Harmse | Senior Lecturer | South Africa |
| Exeter University and Royal Veterinary College | Dr | Keith | Howe | Senior Research Fellow & Honorary Research Fellow | UK |
| ADAS UK Ltd | Miss | Adele | Hulin | Researcher / Network Secretariat | UK |
| Moredun Research Institute | Mr | Coren | Jack | PhD Student | UK |
| University of Copenhagen | | Ipek | Keskin | PhD Student | Denmark |
| Aberystwyth University | Dr | Richard | Kipling | Project Officer | UK |
| Teagasc | Dr | Órlaith | Ní Choncubhair | Post-doctoral researcher | Ireland |
| Norwegian University of Life Sciences | Dr | Şeyda | Özkan | Research Scientist | Norway |
| Norwegian University of Life Sciences | Dr | Clare | Phythian | Associate Prof. Flock Medicine | Norway |
| ILRI | Dr | Tim | Robinson | Principal Scientist / Network Coordinator | Kenya |
| SRUC | Mr | Gareth | Salmon | PhD Student | UK |
| Ministry of Agriculture, Food and Environment | Mr | Rubén | Sánchez Martínez | Support unit Coordinator, Directorate General for Animal and Plant Health | Spain |
| Wageningen University | Dr | Wim | Van der Poel | Research Leader | The Netherlands |
| ADAS UK Ltd | Miss | Alice | Willett | Consultant / Network Secretariat | UK |
| Cranfield University | Dr | Adrian | Williams | Principal Research Fellow | UK |

APPENDIX 14: ANNUAL WORKSHOP 3: AGENDA

| Workshop Agenda | | |
|---|---|--|
| <p>The workshop supports the Network objectives; to maintain and enhance capacity in the cross-cutting field of animal health and GHG research, facilitate interaction of practitioners from relevant research communities (e.g. animal science, veterinary medicine, epidemiology, GHG's, food security, economics) and encourage sharing of information on current and planned activities, so as to avoid duplication of effort, identify gaps and help focus and prioritise research efforts.</p> <p>For further details about the Network, please see http://globalresearchalliance.org/dashboard/animal-health-and-ghg-emissions-intensity-network/</p> | | |
| Time | Agenda Item | Speaker |
| 09:30 – 09:40 | <i>Arrive & Coffee</i> | |
| 09:40 – 09:55 | Welcome and round table for introductions | Tim Robinson (Network Co-Coordinator) |
| 09:55 – 10:15 | Overview of the Network and update on recent Animal Health & GHG research | Tim Robinson (Network Co-Coordinator) |
| 10:15 – 11:45 | Scientific Presentations | |
| 10:15 – 10:35 | Exploring interactions between climate change and livestock parasites | Naomi Fox (Scotland's Rural College, UK) |
| 10:35 – 10:55 | The influence of bovine tuberculosis on GHG emissions intensity in Wales | Adrian Williams (Cranfield University, UK) |
| 10:55 – 11:25 | <i>Tea/Coffee</i> | |
| 11:25 – 11:45 | Can improved productivity reduce the carbon footprint of Senegalese smallholder cattle systems? | Gareth Salmon (Scotland's Rural College and The University of Edinburgh, UK) |
| 11:45 – 12:45 | Discussion Session: Research priorities and knowledge gaps | |
| 12:45 – 13:45 | <i>Lunch</i> | |
| 13:45 – 14:45 | Presentations from initiatives with which the Network is developing links | |
| 13:45 – 14:00 | STAR-IDAZ International Research Consortium on Animal Health | Luke Dalton (Defra, UK) |
| 14:00 – 14:15 | Animal health and pathogen modelling in MACSUR: progress and next steps | Seyda Ozkan (NMBU, Norway) & Richard Kipling (Aberystwyth University, UK) |
| 14:15 – 14:30 | NEAT Progress: Next steps in the economics of animal health | Keith Howe (Royal Veterinary College, UK) |
| 14:30 – 14:45 | Links with FACCE-JPI and opportunities for collaboration | Dr. Orlaith Ní Choncubhair (Teagasc, Ireland) |
| 14:45 – 15:15 | <i>Tea/Coffee</i> | |
| 15:15 – 16:00 | Discussion session: Collaboration to benefit research priorities | |
| 16:00 – 16:30 | AOB, Summary and Close | Tim Robinson (Network Co-Coordinator) |