Minutes of: Annual ASGGN meeting
Location: Pullman Melbourne Albert Park, Melbourne, Australia
Date: Sunday, February 14th 2016

Session 1: Direct and indirect methane measurements
Hutton Oddy presented protocols and pitfalls when measuring methane for genetic improvement. His main messages were that breeding for lower emitting animals is possible, but there is a need for accurate and reliable CH_4 and feed intake records on many animals. The CH_4 records have to be compared with a reliable method to determine the accuracy. Discussion on breeding objective is essential, and should be joined by full consortium of researchers in different disciplines and industry. He ended with a few warnings: (1) Genetic improvement is a recursive process, and (2) be careful with proxies as long as you don't know for sure what the proxy is related to (biological understanding)

Sabine van Engelen presented the results of her study on proxies of methane emission based on milk fatty acid profiles. She emphasized the importance of a herd effect (or its associated effects of genetic lines and diet). Methane predicted on milk fatty acid profiles is a heritable trait, and different prediction equations explain different parts of methane production.

Sanne van Gastelen presented on behalf of a METHAGENE Expert group for proxies for methane. Her take home message was: No proxy fits all, combining proxies to cover more of the story. This will also be written up in a review to be submitted for publication in July 2016.

Session 1: Discussion
The lively discussion showed us that we should be aware of:
- Differences in milk fatty acids and methane from experiment to experiment
- Methods to test additional value of proxies
- Ultimate test: Select extremes based on predicted methane production and get them through respiration chambers for real methane emission
- Methane will be lowered by selecting for milk and RFI

Session 2: Microbial profiles
Bill Kelly gave an overall overview, mainly based on the gained expertise and results in Global Rumen Census (GRC) and Hungate1000. The GRC focussed on 'who is there?', whereas H1000 focussed on 'what are they doing?'. In short, it can be concluded that there is a core of bacteria and archaea microbiome, but

large diversity for protozoa. Large effect of host and diet. >400 genome sequences have been cultivated ~500 genome sequences available.

Phil Vercoe informed us about the Pangenome results. They have recorded 3000 sheep in Australia, and many different phenotypes will reveal complexity.

Jan Lassen showed us a completely different approach, by applying a classical quantitative genetic approach to the microbial data. It showed us that the rumen content is heritable, and it is related to methane and milk composition.

Session 2: Discussion
The discussion emphasized the importance of the biological understanding. Geneticists will be challenged on black box biology that is applied now; they have to understand the underlying mechanisms. Mechanisms of rumen microbiology can cause variation between animals, there is a reason for the existing diversity.

Action: a working group will be formed that focusses on understanding diversity the and the mechanism of animal variation. Initiators: Brian Dalrynple, Phil Vercoe, Ben Hayes, Jan Lassen.

Session 3: Adaptation vs. Mitigation
Ben Hayes updated us on the work done in Australia on heat tolerance. He elaborated a bit on the Heat stress index based on Temperature humidity index. The best trait to measure is rectal temperature, but this is hard to measure on a large scale. The proxy they have investigated is 'decline in production'. That gave very nice results. Ben also hinted on the introgression of the slick gene into Holsteins, as that changes the hair and makes the animals more heat tolerant.

Suzanne Rowe presented the current status of the white paper on adaptation. This working group is established at the previous annual meeting of ASGGN. The white paper covers the following topics: toxicity, heat tolerance, low feed quality, disease resistance, diversity.
After the overview, the participants gave some good suggestions for further improvements:
- Grazing behavior can be important too when weather changes
  - Rapid changes in diet from high quality grain to low quality pasture
- Rumen microbial -> in relation to low quality feed (C3 to C4 plants)
  - What is the optimal rumen content?
  - Early life establishment of rumen content
- Adapt environment rather than animals – sometimes it is cheaper and faster to build a shed
- Put animals in heat stress situations in the respiration chamber - selection
  - It is not always the heat, but even more the solar radiation
- Be aware that it is not the mean that is challenging, but more the variation and waves.

Session 4: Management meeting
Suggested activities for 2016:
1. ICAR Working Group "Feed & Gas",
2. Adaptation vs mitigation,
3. Economic value and breeding schemes,
4. Rumen microbiology.

Suggestions from members:
- Leave out rumen microbiology
- ICAR is an activity finished in ASGGN
  Focus on:
  1. Economic values
     o Economic value should/could be focus of next meeting
     o Correlation structure between traits essential for economic value
     o Will the economic consequence land in the hands of the farmer?
     o **Action:** Form working group on economic value (Robinson, Eileen and Yvette)
  2. Adaptation
     o Adaptation is key area for GRA
     o Finish White Paper on role of genetics in adaptation
  3. Better understanding of biology
     o Understanding underlying mechanisms => where is heritability referring to, what is changing with genetic improvement?
     o Nitrogen metabolism (??)
     o Relation between RFI and methane – no clear answers
       ▪ Decent relationship in beef and in sheep (Paul Arthur).
       ▪ No strong relationship in dairy (Ben Hayes).

Next meeting:
WCGALP meeting in Auckland should also contain an ASGGN meeting (Feb 2018)
Meeting in 2017: either in Edinburgh in June during ICAR or in San Diego in January attached to PAG

Funding opportunities:
SusAn: EU but NZ and Aus can be part
ERAGAS: EU but NZ and USA can be part

Practice brief:
GACSA CCAFS develop practice briefs that summarizes mitigation strategies. The one for 'genetics' will be initiated by Yvette, with input from Steve Davis, Phil Vercoe, Gareth Difford, Hutton Oddy, Jan Lassen and Paul Arthur.

New convenor:
Jan Lassen is elected as the new convenor.

List of attendees:

Name	Country
Adibe Abdalla	Brazil
Claudia Arndt	USA
Paul Arthur	Australia
Greg Bishop-Hurley	Australia
Irene Breider	UK
Steve Davis	New Zealand
Sam de Campeneere	Belgium
Frederic Dehareng	Belgium
Stuart Denman	Australia
Gareth Difford	Denmark
Jan Dijkstra	The Netherlands
Dominique Francois	France
Birgit Gredler	Switzerland
Roger Hegarty	Australia
Arjan Jonker	New Zealand
Jan Lassen	Denmark
Peter Lund	Denmark
Eugene Maguy	France
Chris McSweeney	New Zealand
Enyew Negussie	Finland
Sheilah Nolan	Canada
Hutton Oddy	Australia
Dana Olijhoek	Denmark
James Oltjen	USA
David Smith	USA
Andre Bannink	The Netherlands
Sabine van Engelen	The Netherlands
Sanne van Gastelen	The Netherlands
Phil Vercoe	Australia
Marleen Visker	The Netherlands
Ruidong Xiang	Australia
David Yanez	Spain
Suzanne Rowe	New Zealand
John McEwan	New Zealand
Bill Kelly	New Zealand
Ben Hayes	Australia
Peter Moate	Australia
Elsa Antunes Fernandes	The Netherlands
Jennie Pryce	Australia
Mark Aspin	New Zealand
Dororthy Robinson	Australia
Gilles Renand	France
Martin Scholten	The Netherlands
Yvette de Haas	The Netherlands