
Animal Selection Genetics & Genomics Network

ASGGN

Suzanne Rowe





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Animal Selection, Genetics and Genomics Network

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ASGGN is a forum for scientists exploring the impact of genetic technologies for managing livestock greenhouse gas emissions.

New Zealand globalresearchalliance.org/research/lives...

Joined September 2018

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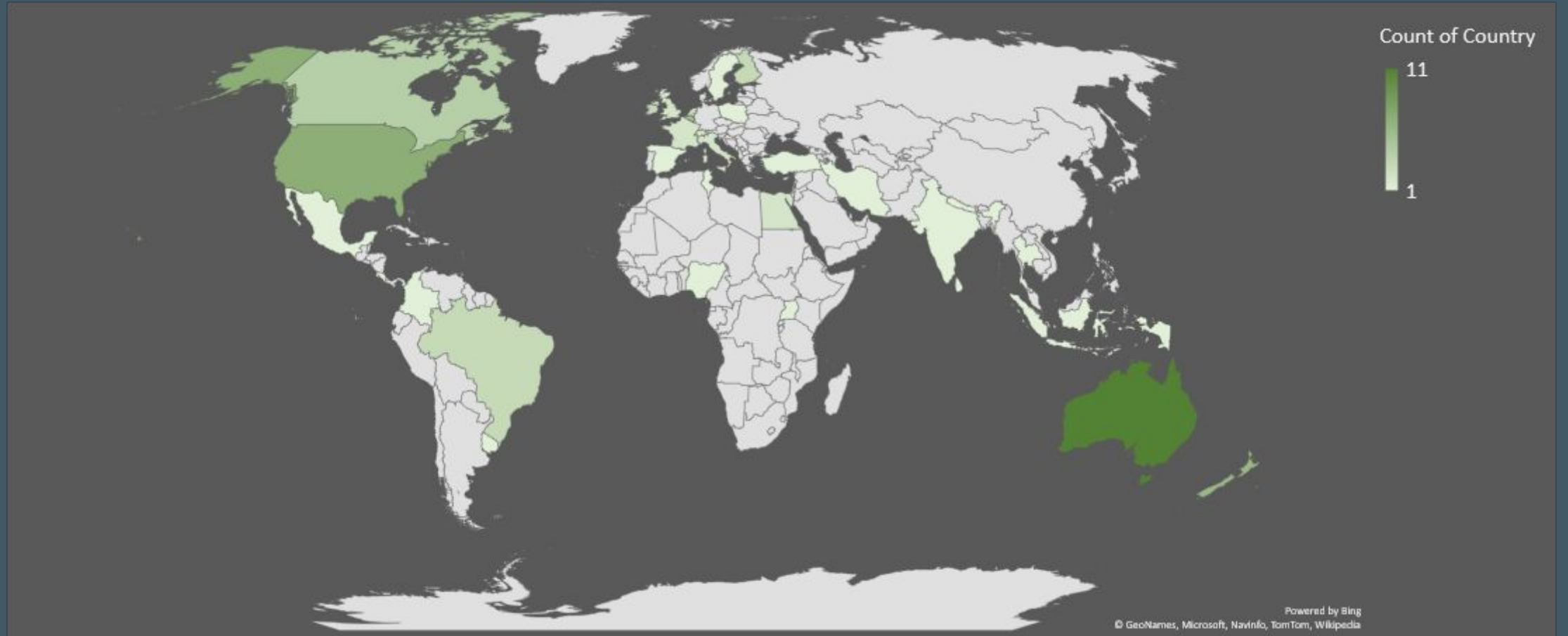
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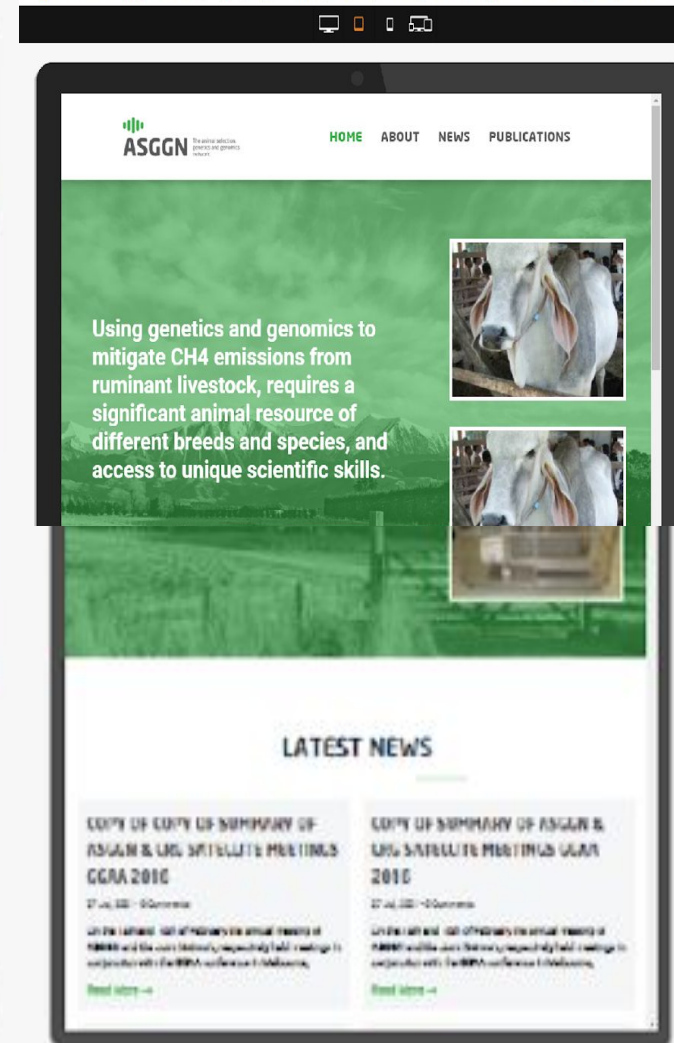
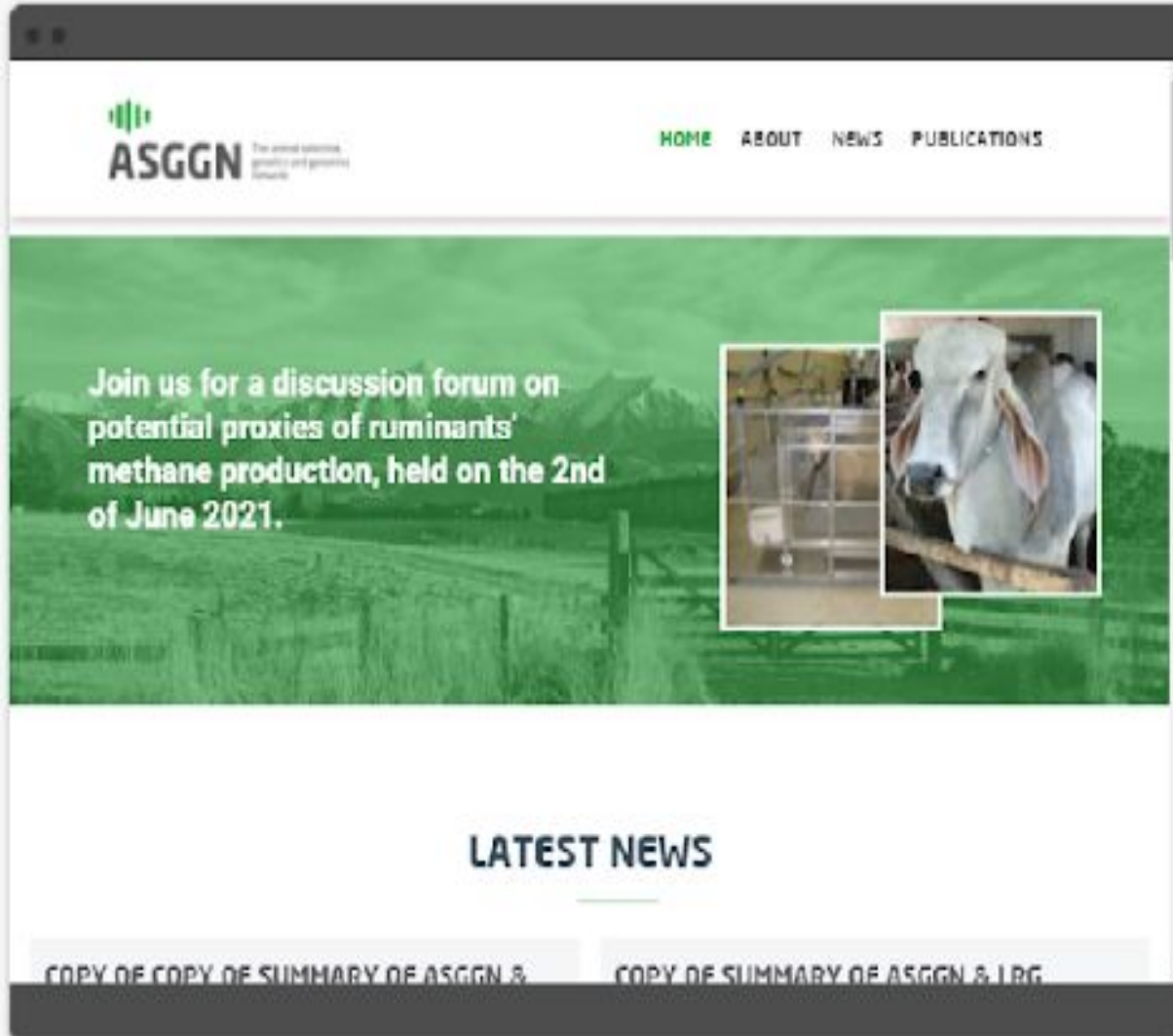
ON AGRICULTURAL GREENHOUSE GASES

@ASGGN_GRA

ASGGN Group Members



https://www.asggn.org



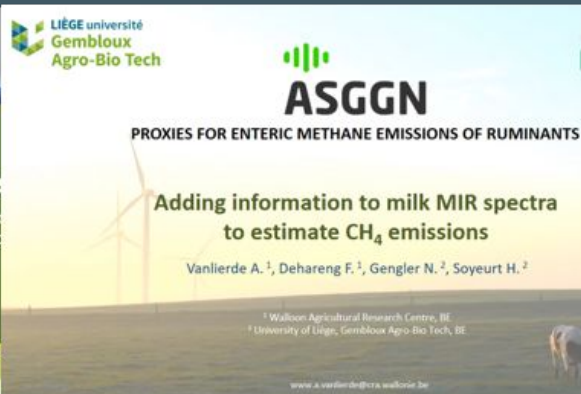
ASGGN – GRA livestock Network



Ruminal VFA predict methane yield

Richard Williams, Murray Hannah, Joe Jacobson, Bill Wales, Peter Moate

AGRICULTURE VICTORIA



LIÈGE université
Gembloux
Agro-Bio Tech

ASGGN

PROXIES FOR ENTERIC METHANE EMISSIONS OF RUMINANTS

Adding information to milk MIR spectra to estimate CH₄ emissions

Vanlierde A.¹, Dehareng F.¹, Gengler N.², Soyeurt H.²

¹ Walloon Agricultural Research Centre, BE
² University of Liège, Gembloux Agro-Bio Tech, BE

www.a.vanlierde@cra.wallonie.be



ASGGN DISCUSSION FORUM 2021

Portable accumulation chambers for estimating methane production by sheep

Hutton Oddy, John Goopy, Roger Hegarty, Dorothy Robinson, Alistair Donaldson, Reg Woodgate, Margaret Cameron, Katie Austin, Sonja Dominik, Peter Wahinya, Julius van der Werf
and many more including Beth Pagonini, Claire Mackay, Andrew Thompson, Phil Vercoe

ASGGN Discussion Forum, June 2021




Rumen volatile fatty acids for ranking CH₄ yield in sheep

Arian Jonker (arian.jonker@agresearch.co.nz), Sharon Hickey, Peter Janssen, John McEwan, Suzanne Rowe

agresearch

The microbiome as a proxy for methane

How it compares to other proxies



Óscar González-Reco
Departamento de Mejora Genética
Madrid, SPAIN

Differences in milk composition associated with enteric methane emissions

Suzanne Rowe, Melanie Hess, Timothy Bilton, Tricia Johnson, Sharon Hickey, Cesar Pinares, Arian Jonker

Enteric methane research at CAAS



Measurement using GreenFeed

Dr. Lifeng Dong
Institute of Feed Research, Chinese

Potential of Rumen Metabolites as Proxies for Ruminant Methane Emissions

Riccardo Bica

agresearch, SRUC, DSM

Could rumen volumes measured by CT scanning help to breed sheep with lower methane emissions?

N. R. Lambe, A. McLaren, K. McLean, J. Gordon and J. Conington

Leading the way in Agriculture and Rural Research, Education and Consulting

Association between fecal methanogen species, methane production, and residual feed intake

Dr. Ghader Manafiazar
Dalhousie University, NS, Canada

ASGGN Discussion Forum
June 2021

DALHOUSIE UNIVERSITY



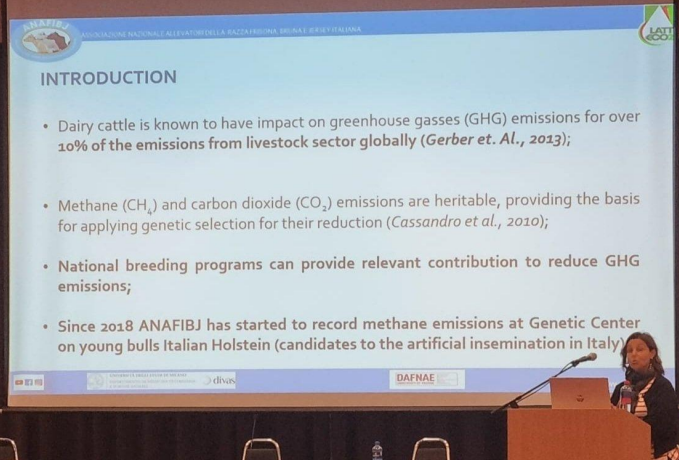
Filippo Miglior, Christine Baes & Flavio Schenkel
CGIL, University of Guelph

Canadian efforts to decrease methane emissions in dairy cattle



World Congress on
Genetics Applied 
to Livestock Production

Rotterdam | The Netherlands
3 - 8 July 2022



INTRODUCTION

- Dairy cattle is known to have impact on greenhouse gasses (GHG) emissions for over 10% of the emissions from livestock sector globally (*Gerber et al., 2013*);
- Methane (CH₄) and carbon dioxide (CO₂) emissions are heritable, providing the basis for applying genetic selection for their reduction (*Cassandro et al., 2010*);
- National breeding programs can provide relevant contribution to reduce GHG emissions;
- Since 2018 ANAFIBJ has started to record methane emissions at Genetic Center on young bulls Italian Holstein (candidates to the artificial insemination in Italy)



Offers Many Opportunities

- Latest development → NIR
- Also on the technology side → miniaturization
- Efficient lab NIR spectrometers
- On-line NIR spectrometers
- Small NIR handheld → NIR (VIS) on a chip



Standardisation of Phenotypes and Genotypes



- The Challenge:** High quality phenotypes are needed
- The Solution:** Measuring ME & FE in Commercial Dairy Farms
 - Installation of feed bins at Sunalta (FG)
 - Installation of CH₄ sniffers in milking robot herds (MG)
- Partnering with Sunalta and milking robot farms**
- Strong investment of capital and human resources**
 - Lactanet investing in Alberta
 - So far we have secured RDAR funding (AB government)
 - Prototyping the CH₄ sniffer device
 - Applying for additional funding in AB, QC and nationally
 - Up to 30 sniffers nationally => 1,800-2,000 cows/year

75 Participants from 25 countries

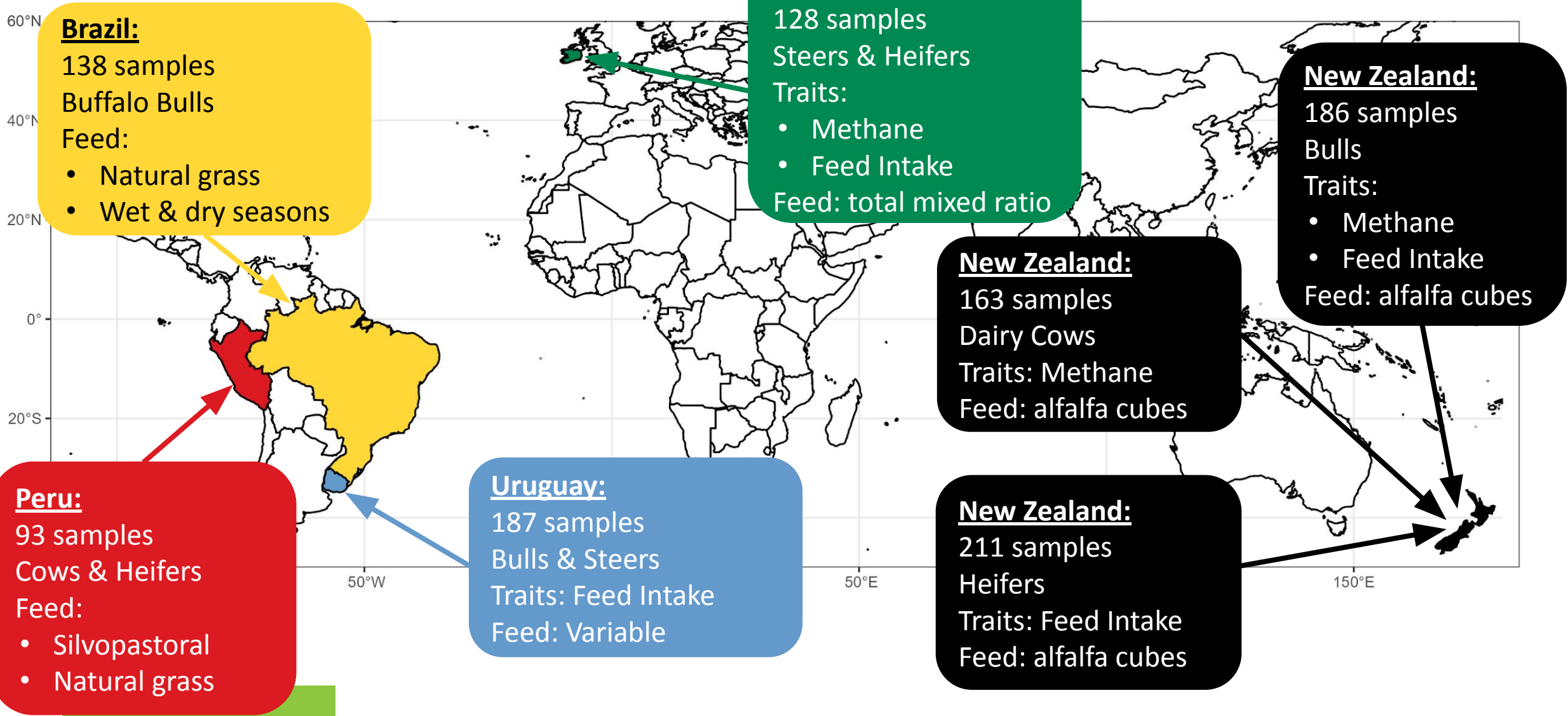
8 Talks

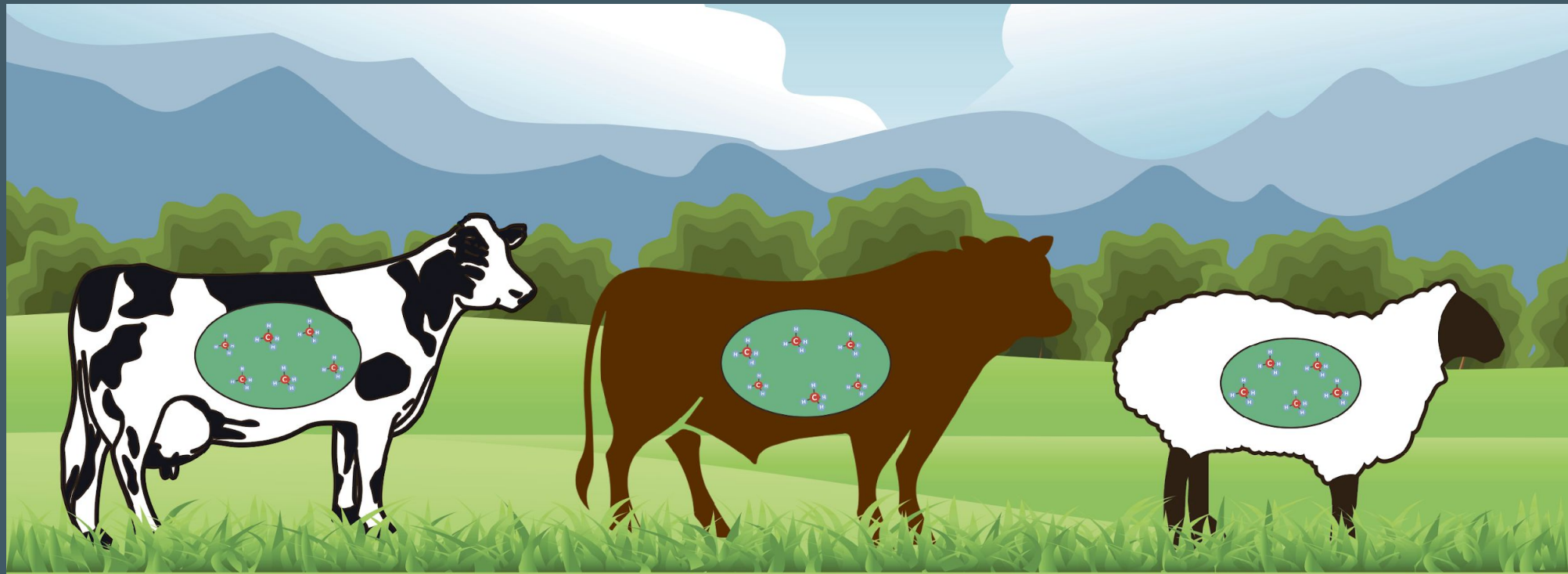
Mix of sheep, beef and dairy cattle

Mix of technologies and methods

Total number of samples: 1106
Number of datasets: 7
Number of countries: 5

Enteric Flagship 2018



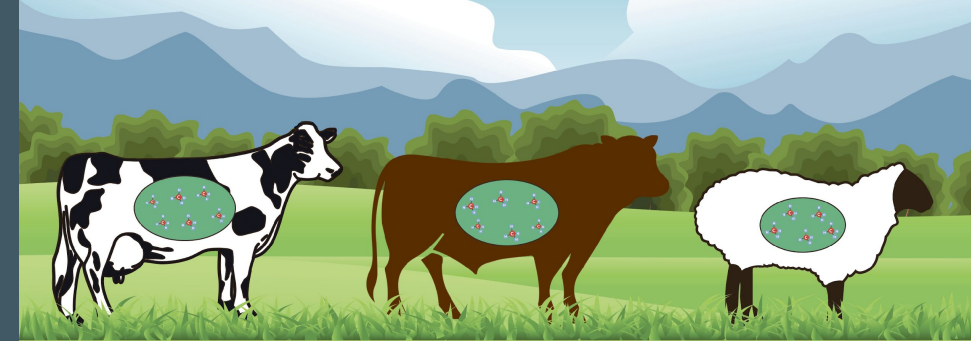


Methane-Predict

*Predicting methane emissions
for ruminants*



New Flagship ?



Methane-Predict

Predicting methane emissions
for ruminants



MET 5.1 low methane sheep have distinct microbiomes and fatty acid profiles in meat and milk



Enteric flagship & GPLER SP5
Rumen microbes predict methane in sheep & Cattle

Rumen microbes
Fermentation of feed to volatile fatty acids

Methane emissions

Milk fatty acids synthesised in rumen and udder

?

New Flagship - what are the links and how can we assay them

Global Networks



suddenly you see a really big difference in the national flock,



across the world, so that everybody can use the system.



and that doesn't sound a lot but it's cumulative and once you accumulate it over 10 to 20 years



is that we want to keep breeding for other things, the other desirable traits on farm.

New Green ERA-HUB submission in preparation

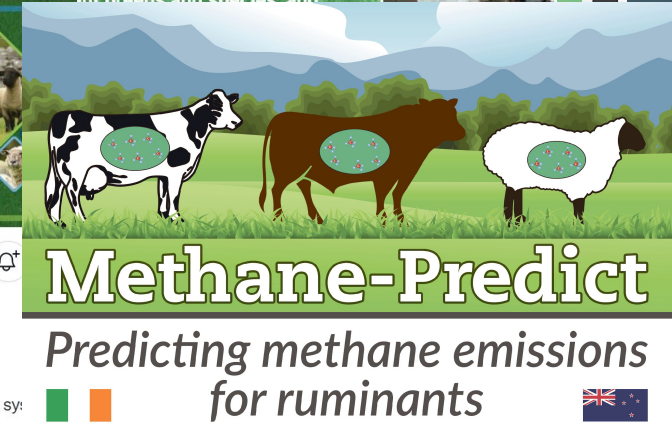
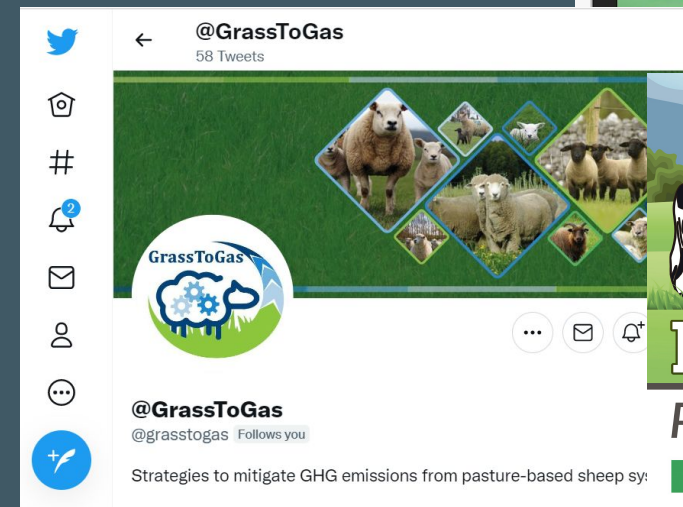
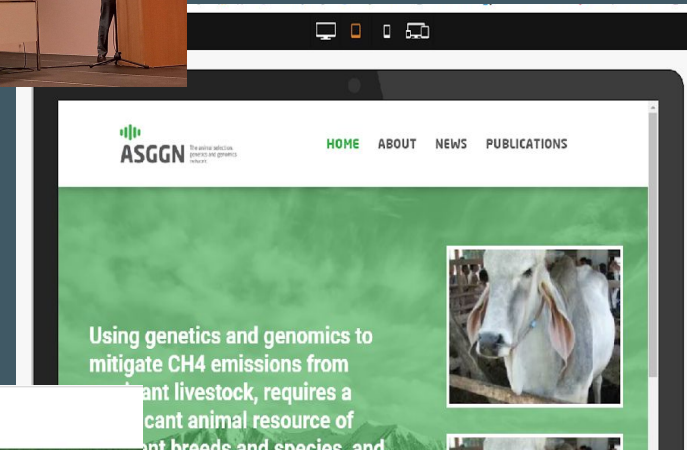
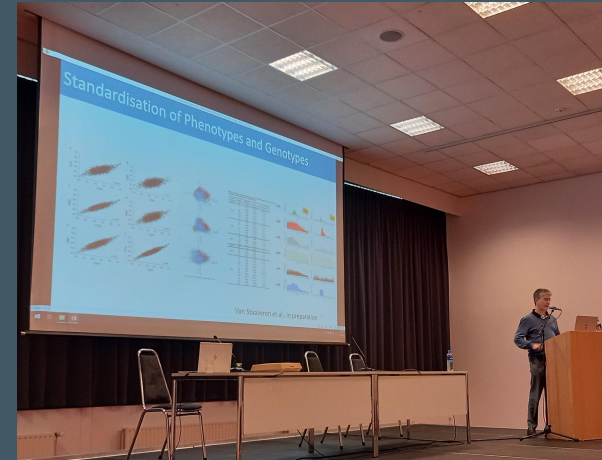
Planned

- Collaborative projects
 - Grass to Gas
 - Methane Predict
 - Flagship

- Cliff Grad to help with website and communication

- ICAR Feed & Gas group

- Meetings/Discussion Forum

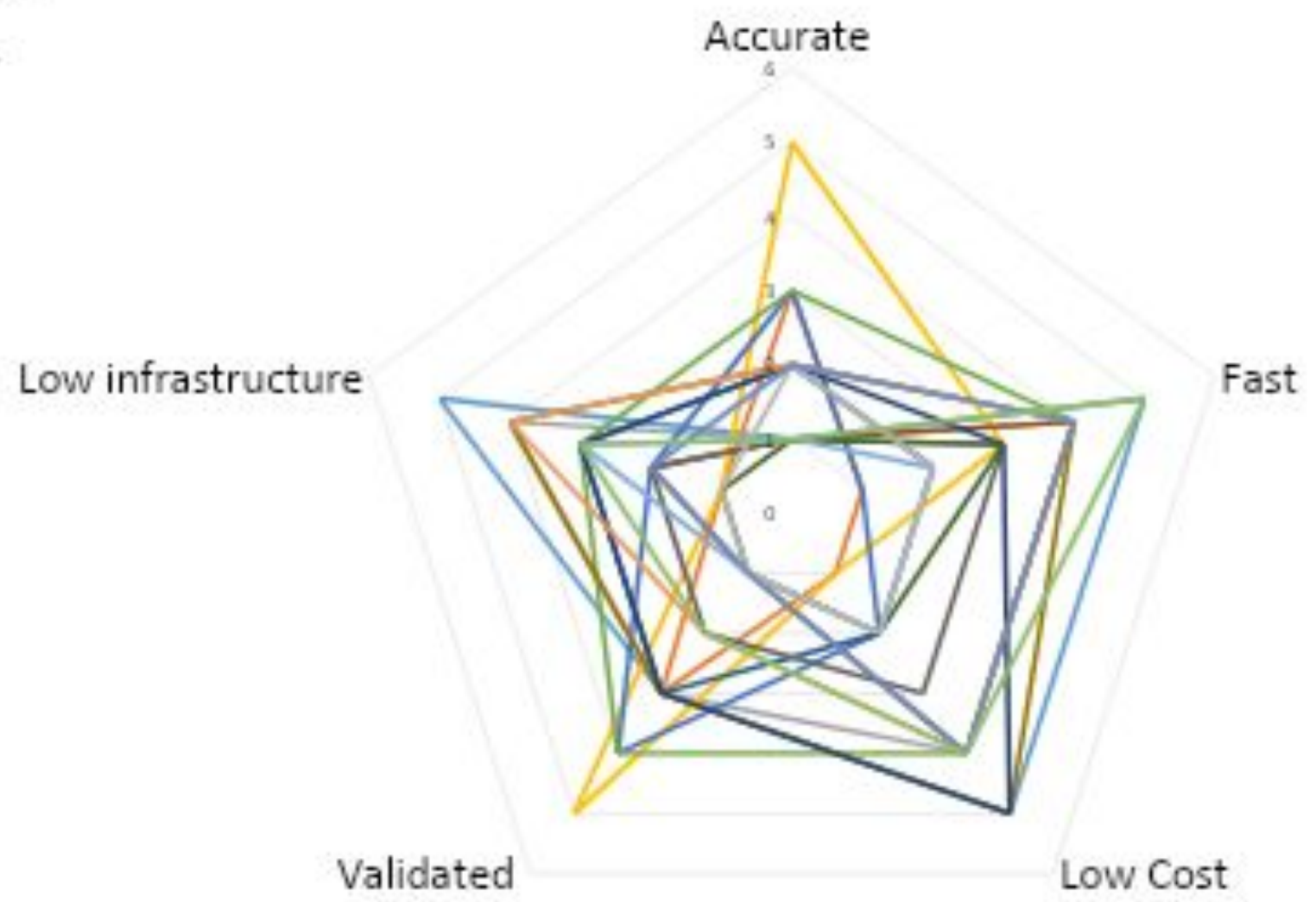


Network – Getting Involved

- www.asggn.org
- @ASGGN_GRA
- suzanne.rowe@agresearch.co.nz



- Weight
- Feed intake
- Production yield
- Respiration Chambers
- Greenfeed
- Portable accumulation chambers
- SF6



Learnings from the ASGGN Meeting

Genetics needs to go hard and go early

Partnerships are really important

Milking robots are in and sniffers are back !

Infra red technology will be innovative and a key contributor

Some countries are only just starting