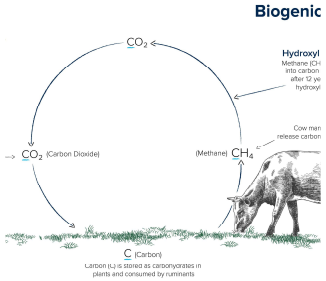
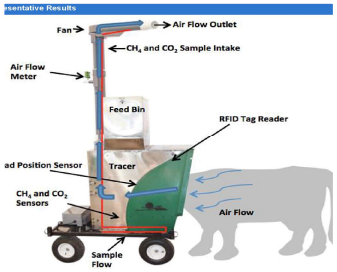
‘Building a Reference Dataset for Methane traits in Beef Cattle’

Overview of the Low Methane Beef Project

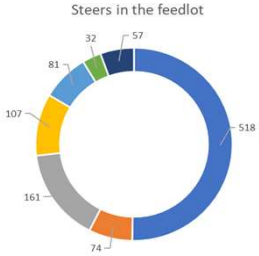
Sam Clark



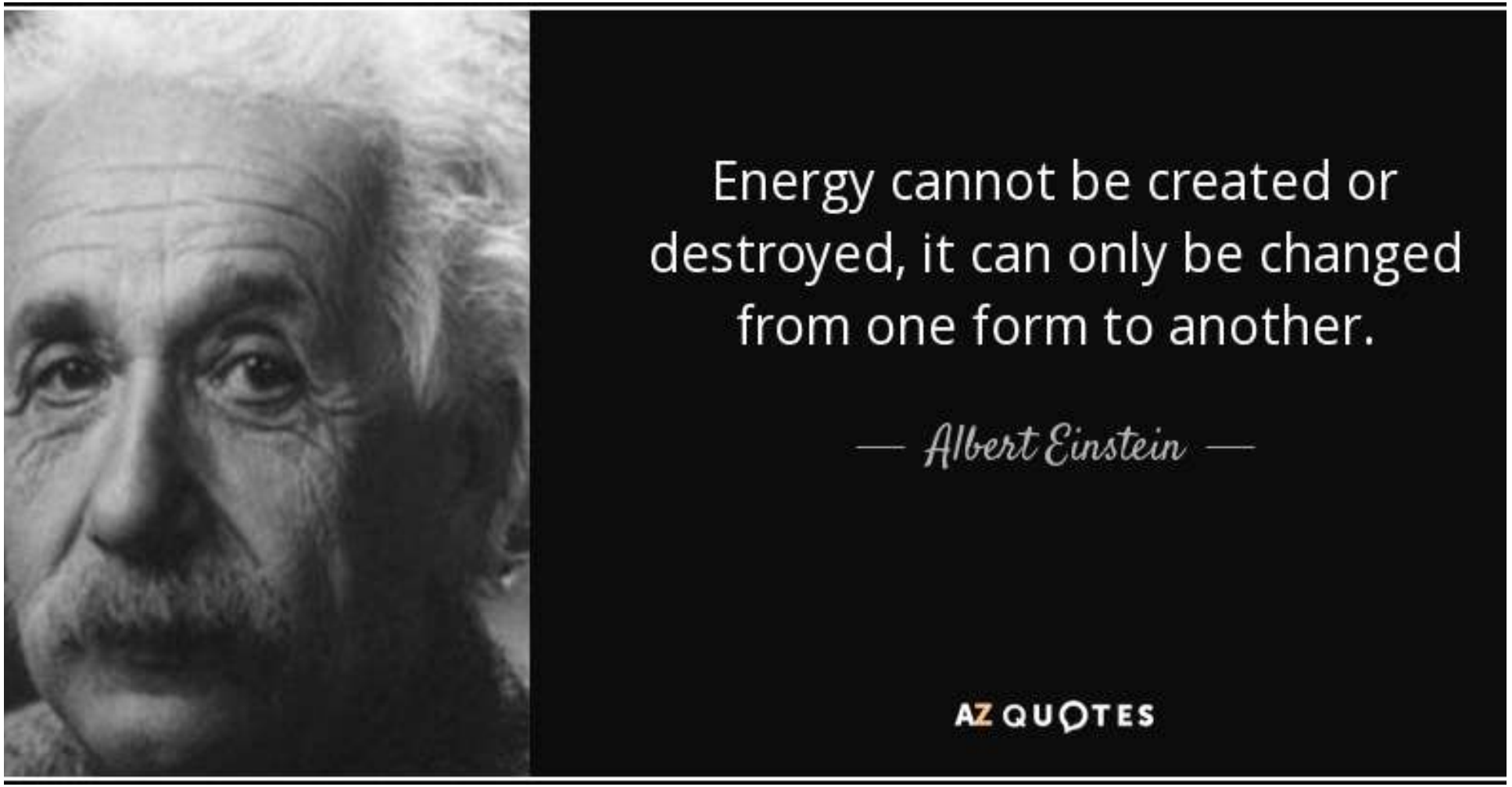
Broad view - carbon management



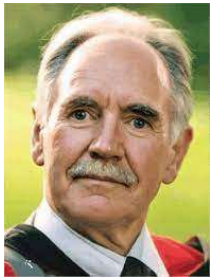
Project background



Activities to date


Energy cannot be created or destroyed, it can only be changed from one form to another.
— Albert Einstein —
AZ QUOTES

How does genetics fit for managing methane?



Gordon ‘Bill’ McClymont

Founder of Rural Science @ UNE

Sustainable Agriculture

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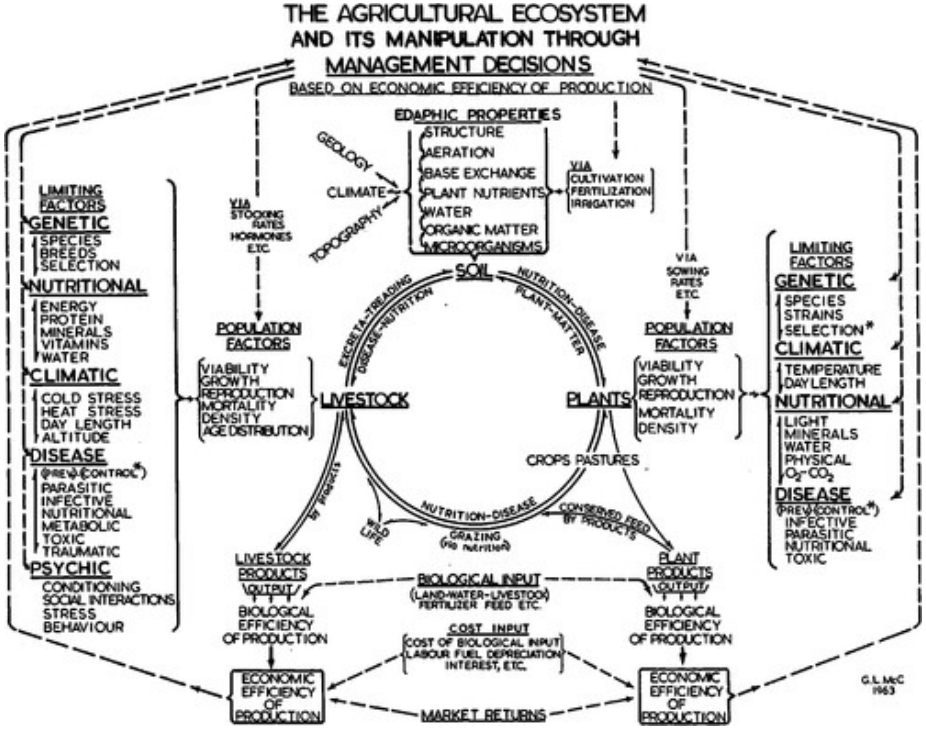
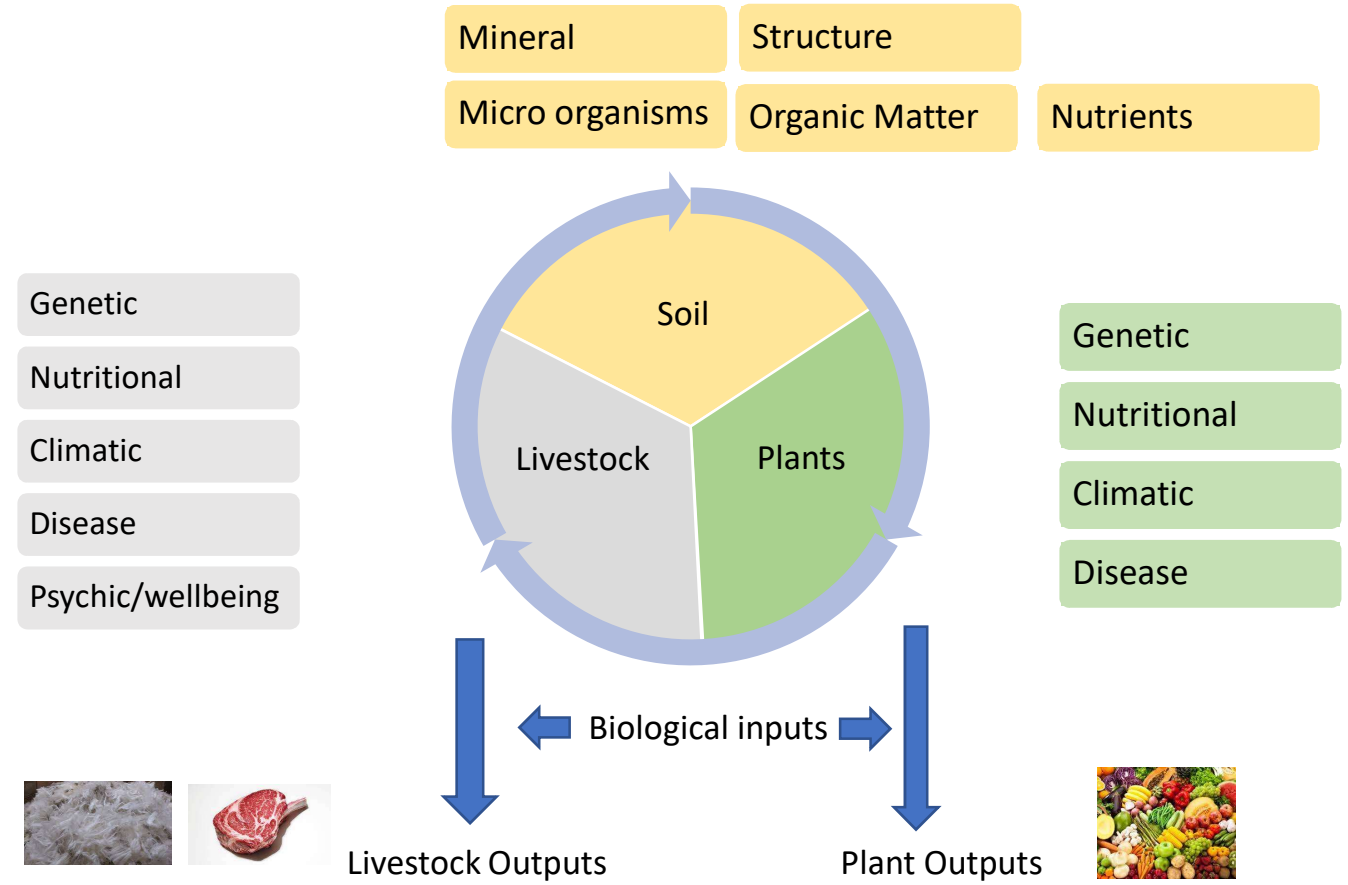


Simplified – where does genetics fit?



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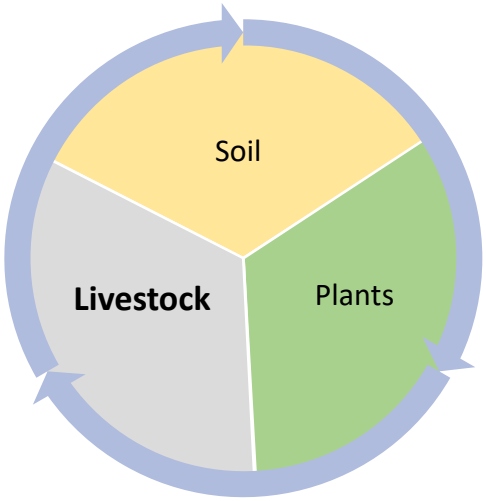
Carbon management – what happens now?

Improved practices to store carbon



Supplements, Probiotics/Microbiome manipulation, Vaccines, Genetics, Productivity

The major carbon converter, Improved sequestration, Natural environment

Plants that help animals be more efficient

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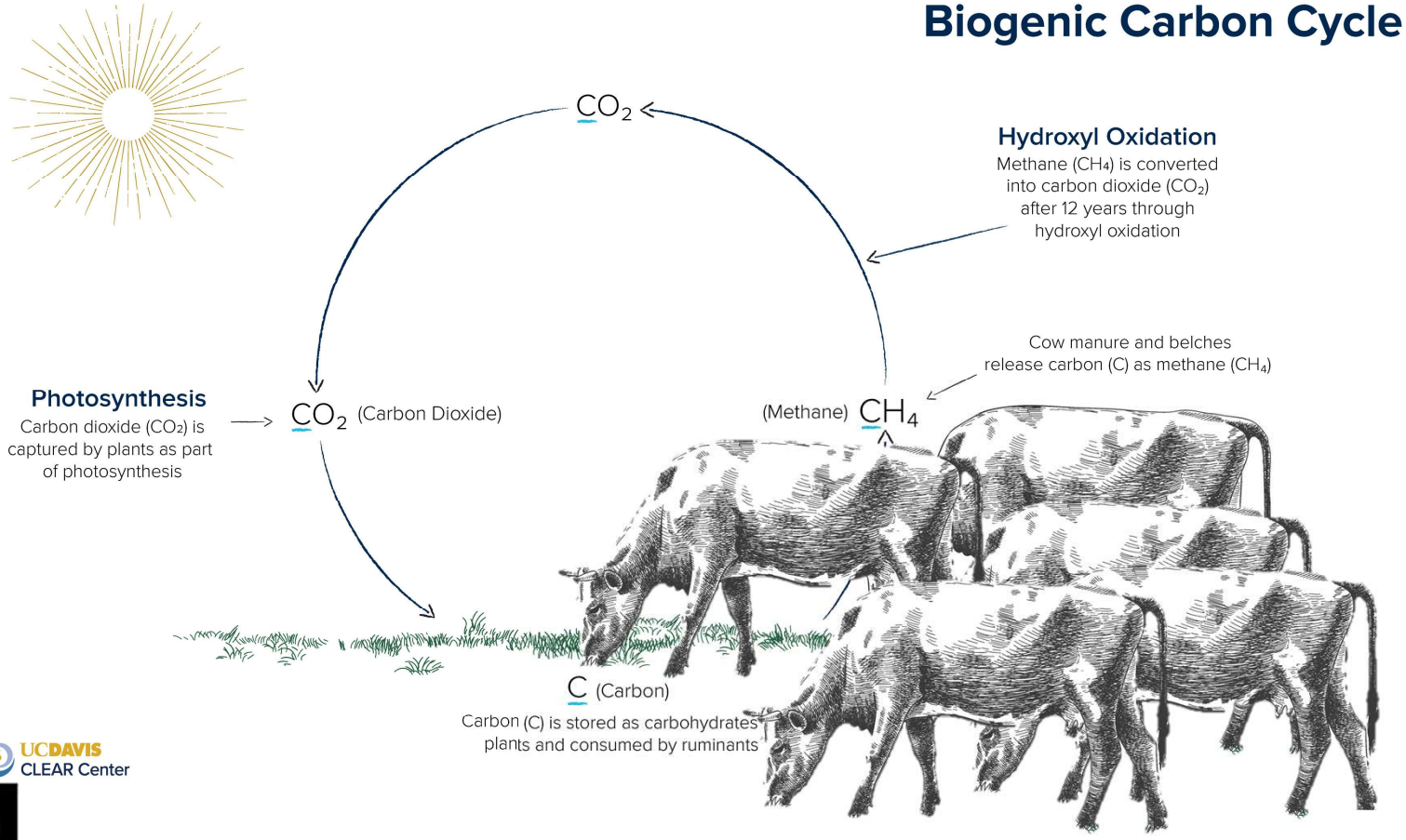
Biogenic Carbon Cycle



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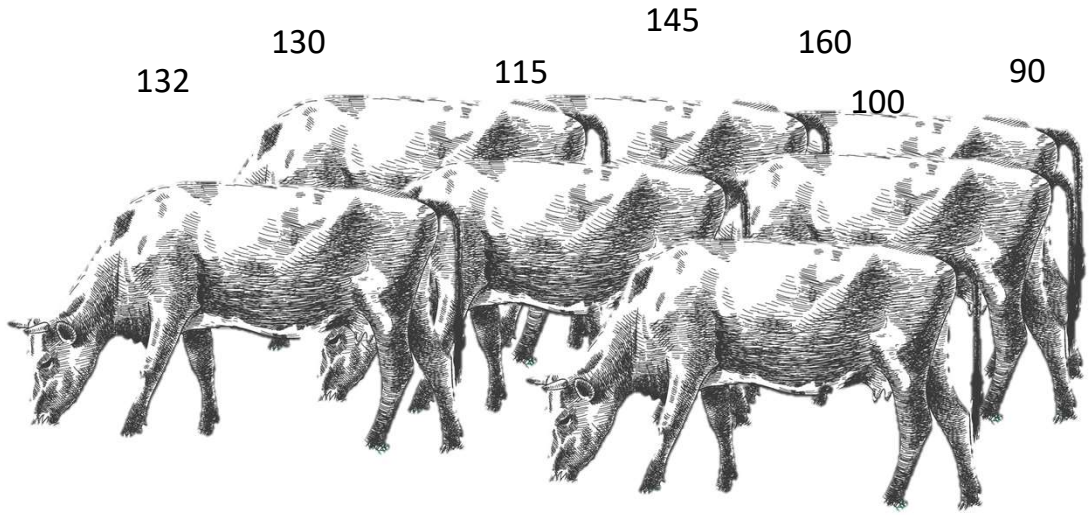
Variation is key!!!!!



CH4 = Lost energy

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How do we find more efficient animals?

Measure, Measure, Measure

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Building reference population for efficiency

- Genetic improvement pipeline to reduce methane and improve productivity in the Australian beef industry

- Form a reference population for genomic selection for reduced GHG emissions

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Collaboration is key

- Recording methane in livestock on a large scale is expensive and too large for a single organisation.

- This is why all of our organisations have joined forces to achieve an essential industry outcome.

mla MEAT & LIVESTOCK AUSTRALIA DONOR COMPANY

NSW GOVERNMENT Department of Primary Industries

agbu

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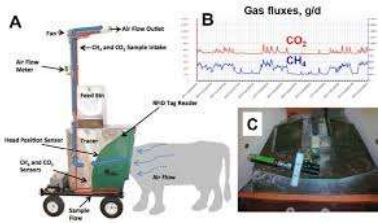
SO HERE'S THE PLAN...

EAP – Beef Project design – value add to existing resource populations

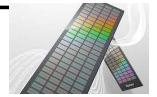
>120K animals previously genotyped

Performance records



- Genotypes
- Sequence data

From the southern multi-breed project (SMB) and Angus Australia



Impact to industry

- Select young seed stock for reduced methane

Past records

Other traits (RFI)

New records (ASBP steers)

Multi-breed herds (50:50 steers/heifers)

- Select young commercial females for reduced methane

-Estimation of parameters
-Systems modelling

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Measurements and number of animals*

- Past records
  - 1,046 young Angus bulls and heifers respiration chambers
  - 119 Angus heifers and 326 Angus steers using Greenfeed Emission monitors (GEM)
  - Feed intake data from previous studies

Traits: CH_4, H, CO_2, Daily feed intake.

Other important traits already measured in SMB and ASBP projects

Measurements and number of animals*

- New animals to be recorded –Greenfeed – 4yrs
  - ~600-750 steers measured from SMB in Tullimba per yr
  - ~ 4-500 Angus steers measured from Angus Sire benchmarking in Tullimba per yr
  - ~600-750 SMB heifers measured on pasture per yr

Traits: CH_4, H, CO_2, Daily feed intake.

Other important traits already measured in SMB and ASBP projects

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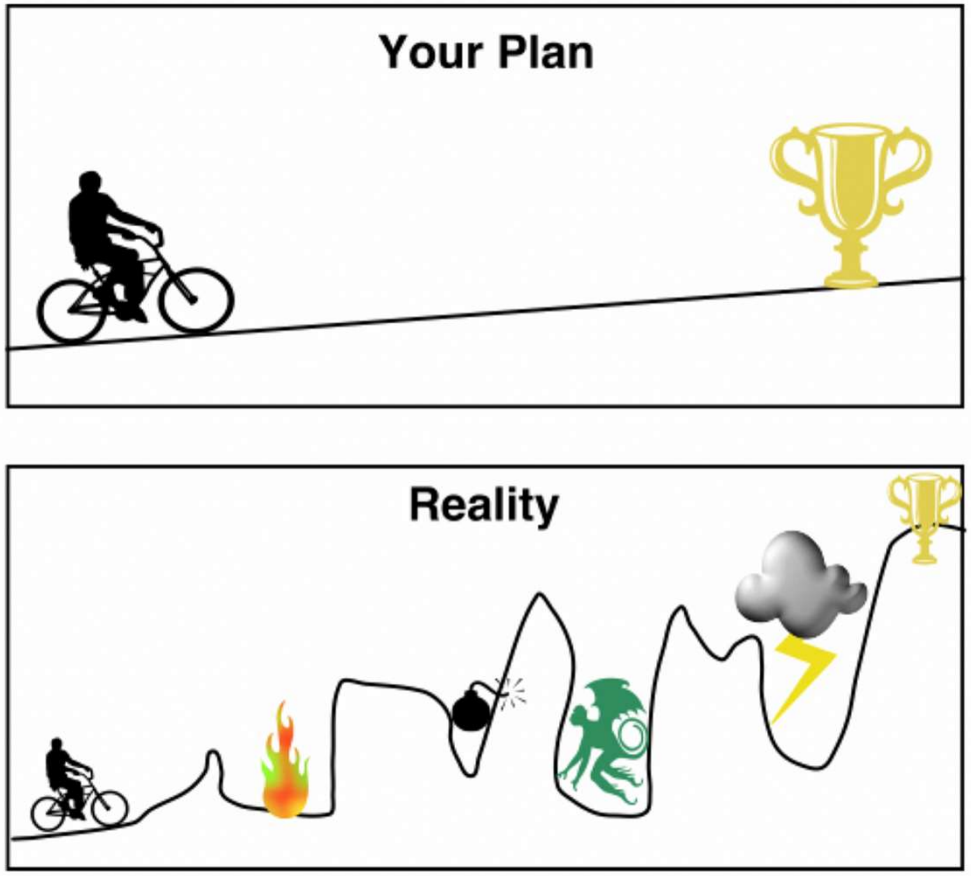

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Where are we up to?

18 new GreenFeed units set up and running

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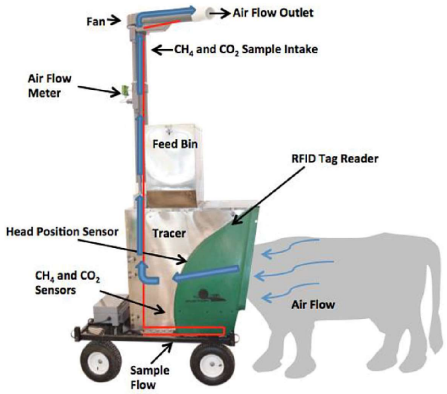
Beef cattle Greenfeed – @Tullimba



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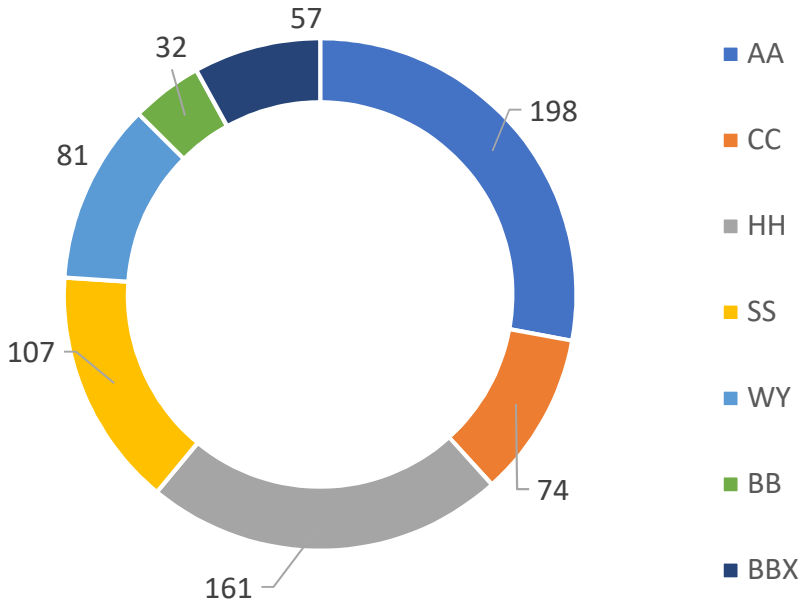
Feedlot recording – Year 1

- ~320 Angus Steers
- ~710 SMB Steers

Highlights

- Good attendance (~30 days recording)
- (~65-85% of animals attending the units)
  - 1 group of Angus steers had 100%
- Aiming for 30 records per hd (>3min)



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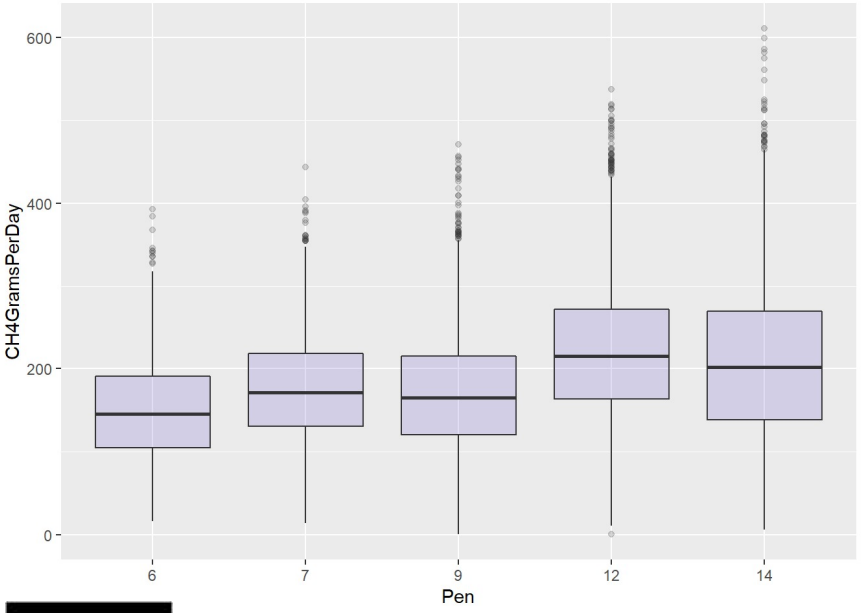
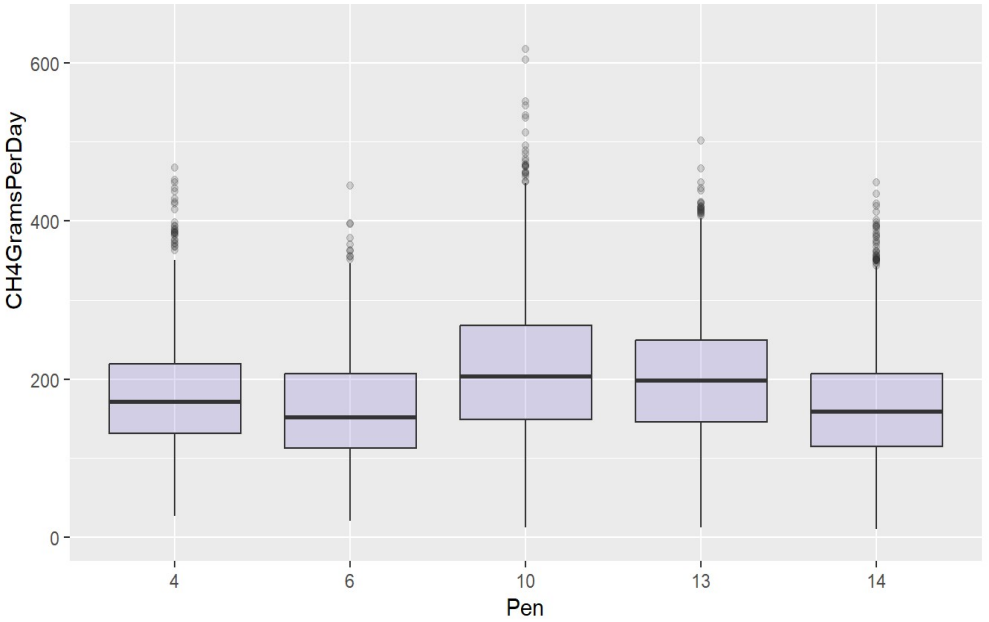
So what does the data look like?





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The set up – recording on pasture – Yr 1

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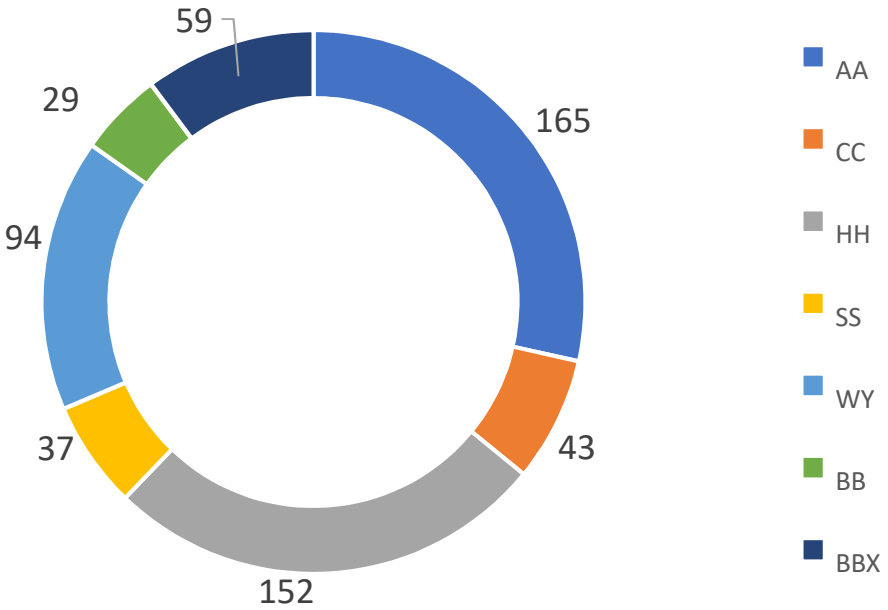
Heifer recording - yr 1

- ~580 heifers
- Attendance 50-79%
- 4 sites
- Weekly pasture cuts
- Observations
  - Getting good attendance
    - Protection from bullies
    - Managing training
    - Managing cup drops
    - Some just never want to try new things



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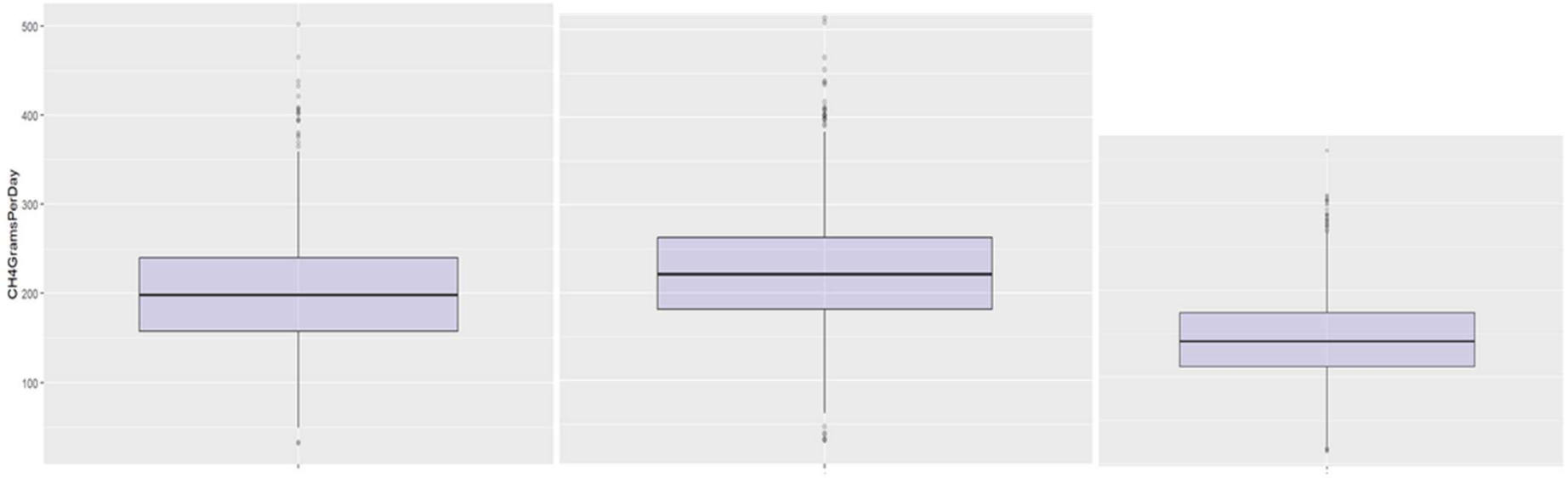
Variation is key



North Coast - Wollongbar

Western Sydney - EMAI

Central West NSW- Trangie

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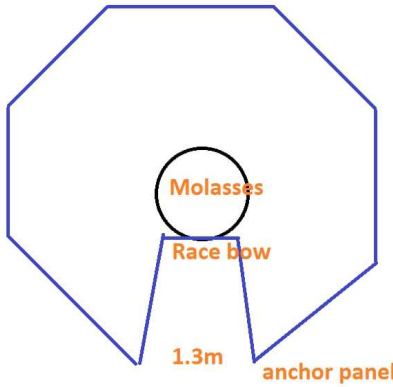
Challenges and future

- Recording with good attendance
  - Training units
  - Trial management
  - Managing bullying
  - Keeping GreenFeeds working (with good attendance)

- Rumen fluid sampling Microbiome, Protozoa and VFA's



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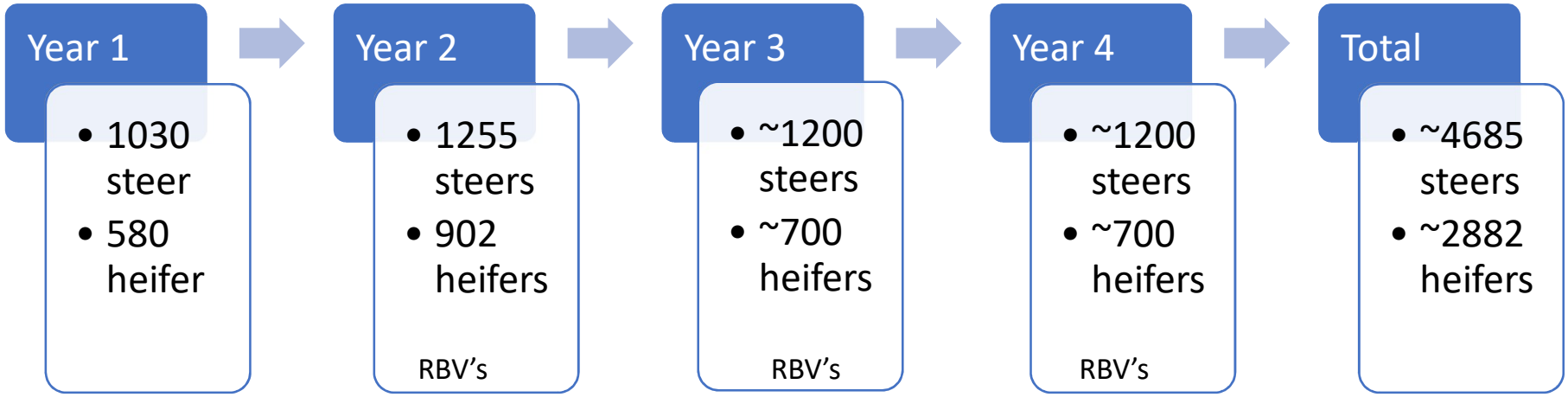
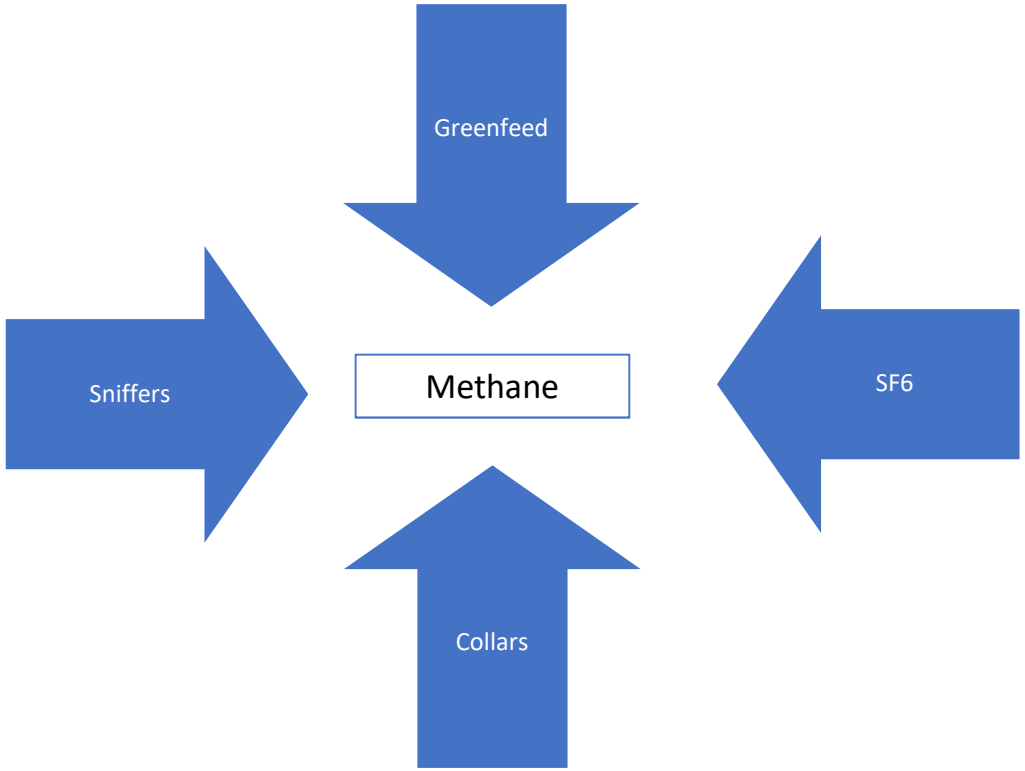
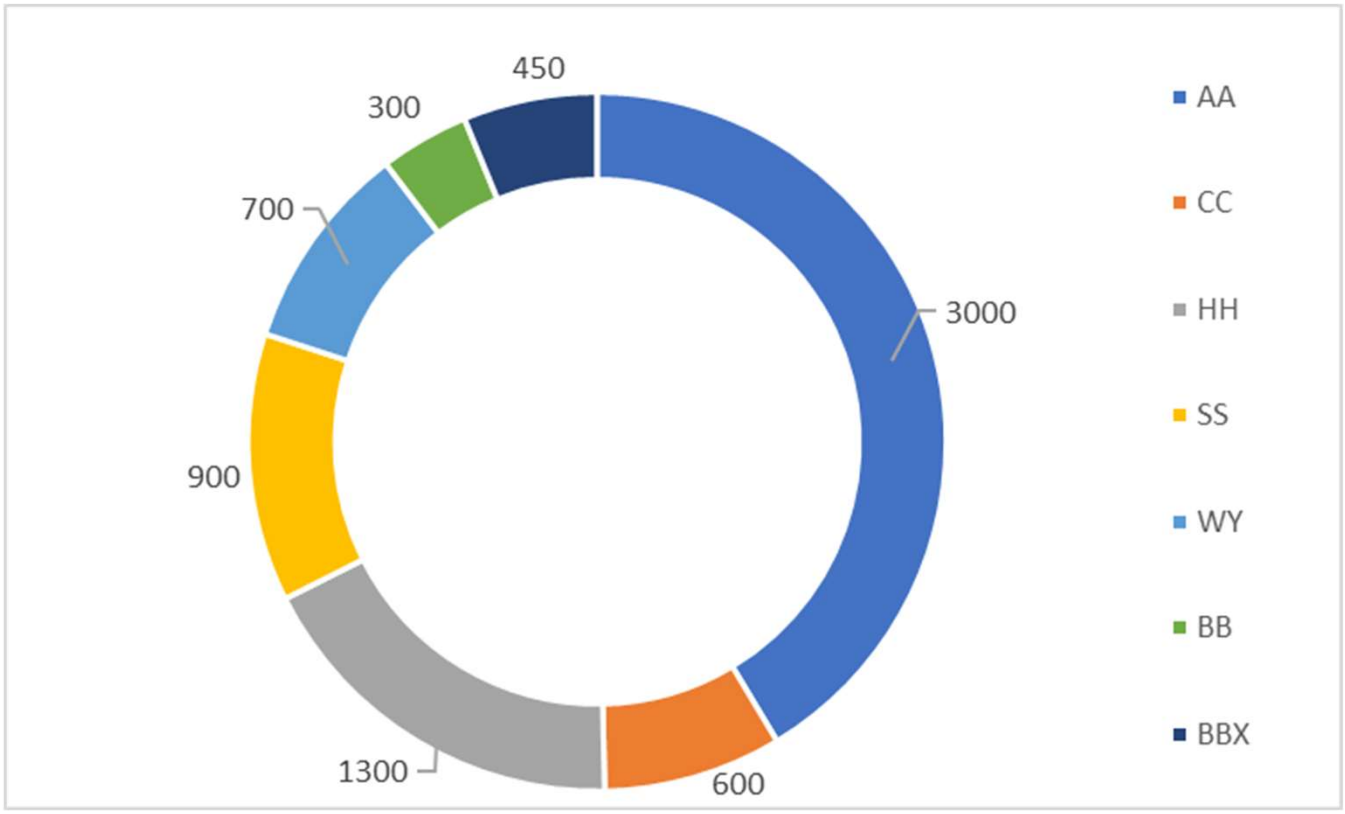
Timeline of records



Opportunities - Overlaying other recording tools



Opportunities – more recording is required



Summary

- Recording is in full swing – year 1 is complete and 3 more years to go
- More recording is required!!!!! This is just the start!!!
- Correlations with other traits (and other ways to record methane)

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Acknowledgements

- NSW DPI
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