



**Global
Methane
Genetics
initiative**

Led by



WAGENINGEN
UNIVERSITY & RESEARCH

In Partnership with



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FUND



Global
Methane
Hub

GMG Sheep Working Group meeting

30-04-2026



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Agenda

- Welcome
- Open discussion with all
- GMG sheep projects
 - **Australia:** Michael Aldridge
 - **Uruguay:** Gabriel Ciappesoni
 - **Scotland:** Nicola Lambe
 - **Ireland:** Noirin McHugh
 - **New Zealand:** Suzanne Rowe
- Update GMG-initiative
- AOB



Open Discussion with all

What is going on in your group/institute, related to:

- Sheep-methane projects beyond GMG?
- Genotype × environment interactions?
- Adoption and incentives for breeding as a mitigation strategy?
- Genetic correlations between methane and other key traits?
-



Updates of GMG-sheep projects

GMG sheep projects



Update GMG

NEW projects & proposals

- **ICARDA:** measure methane in small holder farms in Africa & India
- **Buffalo proposal** (Lead University of Adelaide, Australia, Asian countries & South America)
- **Asia cattle proposal** (Bangladesh, India, Indonesia, and Pakistan)





Share data,
and accelerate genetic progress
to reduce methane emission

Global Methane Genetics Initiative

LOGIN

Please log in to continue to your account.

Email

Password



Remember me

[Forgot password?](#)

Log in



For registration, please contact us at methane-registry@datagene.com.au

GMG project:

Framework adoption & incentivization system for genetic selection as methane mitigation tool

**Methane
breeding value
validation
protocol**

Webinar
May 11, 2026

**SWOT analysis
trait definition
Selection index
Breeding objective**

Webinar
April 13, 2026

**Review of
policy levers
and market
mechanisms**

Webinar
May 7, 2026

Session at ICAR meeting in Verona: Adoption & Incentives to Breed for Methane Mitigation
<https://icar2026.it/meeting-programme/> & panel discussion

Webinars & WG meetings

Towards guidelines to validate genetic evaluations for enteric methane emissions

Date and time
Monday, 11 May 2026
12:00-13:00h CET

Latin America working group meeting

Date and time
Tuesday, 12 May 2026
16:00-17:30h CET

Beef working group meeting

Date and time
Monday, 18 May 2026
13:00-14:30h CET

Microbiome working group meeting

Date and time
Tuesday, 9 June 2026
12:00-13:30h CET

Webinar planning GMG initiative 2026

Measuring methane emissions using Laser Methane Detection (LMD) in rural livestock systems: key considerations

Date and time
Wednesday 25 March 2026
9:00-10:30h CET

SWOT analysis of methane trait definitions and consequences for breeding programs

Date and time
Monday, 13 April 2026
12:00-13:00h CET

Dairy working group meeting

Date and time
Thursday, 23 April 2026
12:00-13:30h CET

Sniffer data aligning and editing pipelines

Date and time
Wednesday, 29 April 2026
14:00-15:30h CET

Sheep working group meeting

Date and time
Thursday, 30 April 2026
12:00-13:00h CET

Enabling adoption of methane-reducing breeding programs through GHG accounting and MRV frameworks

Date and time
Thursday, 7 May 2026
12:00-13:00h CET

Africa working group meeting

Date and time
Friday, 8 May 2026
13:00-14:30h CET

News
flash*

GMG newsletter:



In person meetings



World Congress on
Genetics Applied
to Livestock Production
Madison, Wisconsin
12-17 July 2026



27th AAABG Conference
23-25 March 2027
Geelong | Victoria | Australia

Genetic Advances through Innovative Next-generation Technology

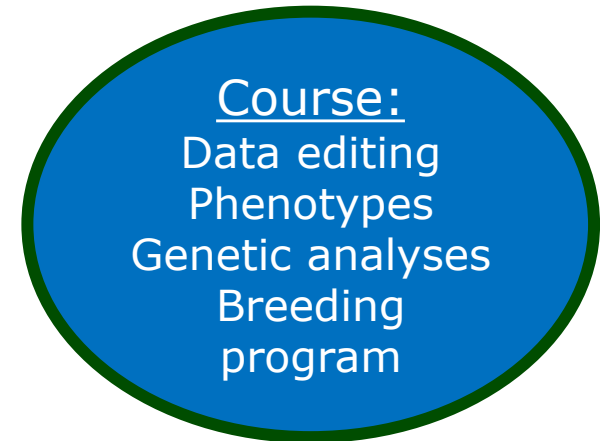


EOI Call for Papers Extended!



Verona, Italy
29 May - 5 June 2026

Shaping the Future of Sustainable Livestock
Let's meet in Verona



Course:
Data editing
Phenotypes
Genetic analyses
Breeding
program



The 77th EAAP Annual Meeting
07/11 September 2026 - Hamburg, Germany



Any other business & closure

Contact:
gmg@wur.nl

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Update on GMG sheep project

D.J. Brown, . M.N.Aldridge,

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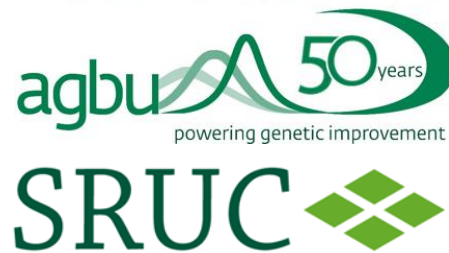


Key outcomes

- Collation of historical data into a combined dataset
- A minimum of 16,000 new phenotypes for methane on genotyped animals
 - Feed intake traits and microbiome through collaboration
- Accurate breeding values and indexes for all countries
- New proxy measures of methane and possibly feed intake to deploy to use as selection criteria
- Development of training and knowledge transfer programs and resources



Contracting and IP principles



In Australia

- We plan to measure 7,400 animals in GMG
- To date 1,000 measured, with another 500 being measured this week
- At least another 2,000 to be measure this year
- Two additional teams have been trained
- Eagle-2 and Eagle-3 are measuring the same animals
- Highly collaborative with ZNE CRC which is measuring 6,300 animals



Next steps

- Data sharing to start international evaluation
- We still use handwritten records > Excel transcription > QA checks > Temp. database
 - This works for project breeding values
 - What data is needed for the national evaluation and the GMG database is a work in progress
- Automated output from Eagle would be ideal
- Unified international identification of sheep



Breed wording	Breed code
Alpine	ALP
Assaf	ASS
Aussie White	AUW
Basco-Béarnaise	BAB
Belclare	BEL
Blanche du Massif Central	BMC
Border Leicester	BOL
Charollais	CHA
Coopworth	COO
Corriedale	CRR
Corse	COR
Creole	CRE
Crossbreds	XXX
Dorper	DOR
Hampshire Down	HAD
Hungarian Merino	hMER
Lacaune	LAC

Breed wording	Breed code
Latxa cara negra	LCN
Latxa cara rubia	LCR
Manech tête noire	MTN
Manech tête rousse	MTR
Merino	MER
Norwegian White Sheep	NWS
Poll Dorset	POD
Romney	ROM
Saanen	SAA
Scottish Mountain	SCM
Southdown	SOD
Suffolk	SUF
Texel	TEX
Tsigai	TSI
Vendéen	VEN
Welsh Mountain	WEM
White Dorper	WDO
White Suffolk	WSU

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Uruguayan Update

Clean Breeding Project

INIA Uruguay | Global Methane Genetics Initiative



1. What are you working on now?

Methane Measurements (INIA Las Brujas)

- 8 PAC units fully operational
- Corriedale & Texel flocks (~100 ewes/breed)
- Plan to increase PAC capacity



Feed Efficiency Trials (INIA La Magnolia)

- 2nd trial: Corriedale & Texel lambs (n=110)
- 1st trial completed: Dohne Merino (80 lambs)



Expansion to Stud Flocks

- Additional PAC units in procurement
- Trailer-based PAC for on-farm phenotyping



1. What are you working on now?

Global
Methane
Genetics
initiative



Methane Measurements (INIA Las Brujas)



Feed Efficiency Trials (INIA La Magnolia)

Expansion to Stud Flocks

Extension & Outreach

- Workshops with students & schools
National radio coverage
Upcoming INIA Board presentation



2. What is your plan?

Research & Field Activities

Feed efficiency + methane trials (La Magnolia): ~100 Texel & Australian Merino; ~100 Corriedale & Dohne Merino

Whole-flock measurement (Las Brujas): ~100 ewes/breed + previously measured lambs

On-farm methane measurements: New PACs + trailer-based systems for stud flocks

Genotyping: All trial animals (DNA already collected)

Rumen fluid sampling: All animals in feed efficiency trials

Compliance, Engagement & Outputs

Nagoya Protocol: Procedures initiated with Ministry of Environment; bilateral agreement with NZ required

Industry engagement: Awards at Rural del Prado (4th consecutive year) for lowest-methane & highest-efficiency lots

Genetic outputs: Publication of Methane EPDs for Merino (December)



3. Roadblocks & Lessons Learned

- **Administrative delays**
Slow agreement signatures; internal delays in project registration, budgeting & invoicing
- **Importation constraints**
Rumen fluid preservation materials need importation (2–3 month typical delays)
- **Nagoya Protocol compliance**
Coordination with Ministry of Environment; bilateral agreement with New Zealand required
- **Human resources**
Recruitment of dedicated project staff took longer than expected (now advancing)
- **Equipment availability**
Eagle 3 methane measurement system currently unavailable on the market



Key Lesson Learned

Early anticipation of administrative processes, international permits, imports, and staff recruitment is critical — these factors directly condition the biological and experimental timeline.

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4. Data Collection Overview (2026)

~600

total animals
with methane data



Group	Breed / Type	N	Status
Feed efficiency trials	Dohne Merino	80	Completed ✓
	Corriedale + Texel	115	Ongoing
	Texel / Aus. Merino	100	Planned
	Corriedale / Dohne	100	Planned
INIA Las Brujas (PAC)	Corriedale lambs	80	Ongoing
	Texel lambs	80	Ongoing
	Breeding ewes	~160	Ongoing
Fac. Agronomy nucleus	Australian Merino	≥100	Planned

✓ All genotyped

✓ RFI (intake trials)

✓ Rumen fluid sampled

5. Topics for Discussion

Protocol Harmonization

Strong need to coordinate and standardize measurement protocols, particularly for pasture-based animals and on-farm scenarios. Alignment across GMG partner countries is essential for data comparability.

World Congress / GMG Meeting

Clarify objectives, expected outputs, and coordination mechanisms for the upcoming project meeting and associated international events. Define Uruguay's role and contributions.

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Clean Breeding Project – GMG Initiative

Towards low-methane, high-efficiency sheep genetics for Uruguay and beyond



CleanBreeding: UK

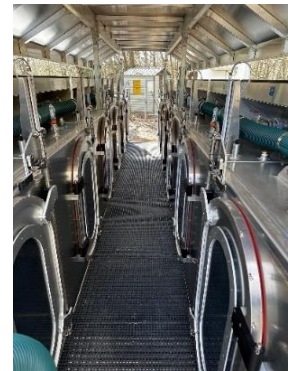


Aim: This initiative aims to fast track the development of reference populations and tools to expedite worldwide selection for reduced methane emissions



Experimental plan:

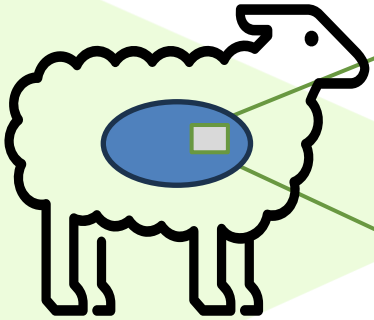
- **Performance recorded Texel lambs**
 - ~1200 lambs over 4 years
 - 360 in 2025; 360 booked in for 2026 (3 well-connected flocks)
- **Portable accumulation chamber (PAC) measurements**
 - CH₄, CO₂, gas ratio
- **Genotypes**
- **Background performance and pedigree data**



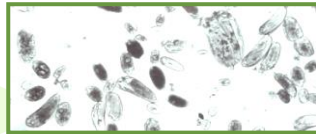
Global Methane Genetics



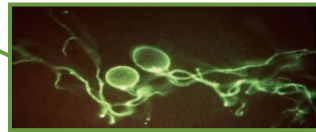
CleanBreeding: UK



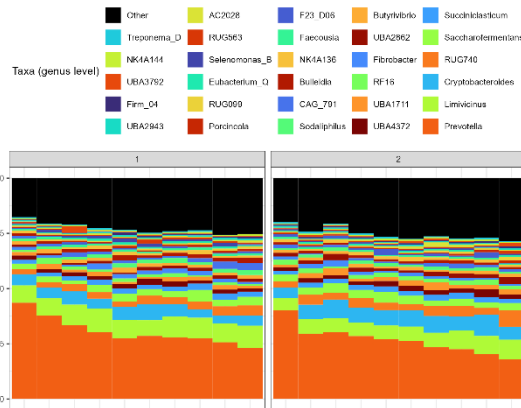
Bacteria



Protozoa



Fungi



Experimental plan:

- Performance recorded Innovis nucleus flock
 - 360 lambs of maternal breeds in 2026
 - ~360 lambs x 3 previous years
- Rumen sampling
- Portable accumulation chamber (PAC) measurements
 - CH₄, CO₂, gas ratio
- Genotypes
- Background performance and pedigree data



BREED FOR CHANGE
BREEDING LOW METHANE SHEEP



Global Methane Genetics

Data collected to calculate methane emissions (g/d)



BREED FOR CHANGE
BREEDING LOW METHANE SHEEP

SRUC

EID	Chamber	Time 1	CH4-1	O2-1	CO2-1	Time 2	CH4-2	O2-2	CO2-2	Time 3	CH4-3	O2-3	CO2-3	Date
826054276822139	1	09:25	0	20.9	0	09:51	650	19.3	1.2	10:16	1100	18.1	1.5	24/10/2024
826054276822331	2	09:26	0	20.9	0	09:52	860	19.2	1	10:18	1750	17.9	1.8	24/10/2024
826054276822049	3	09:26	0	20.9	0	09:53	710	19.4	0.9	10:19	1350	18.4	1.6	24/10/2024
826054276822157	4	09:27	0	20.9	0	09:54	810	19.3	1	10:20	1400	18.2	1.7	24/10/2024
826054276822165	5	09:28	0	20.9	0	09:55	710	18.7	1.2	10:21	1200	17.3	1.9	24/10/2024
826054276822258	6	09:28	0	20.9	0	09:56	590	18.9	1.3	10:22	960	17.6	2.1	24/10/2024
826054276822287	7	09:29	0	20.9	0	09:57	720	19.2	1	10:23	1300	18	1.4	24/10/2024
826054276822355	8	09:29	0	20.9	0	09:58	610	19.8	0.8	10:24	970	18.7	1.4	24/10/2024
826054276822081	9	09:30	0	20.9	0	09:58	470	19.6	0.8	10:25	890	18.4	1.4	24/10/2024
826054276822053	10	09:31	0	20.9	0	09:59	720	19.6	0.9	10:25	1250	18.5	1.6	24/10/2024
826054276822160	11	09:31	0	20.9	0	09:59	720	19.6	0.9	10:25	1250	18.5	1.6	24/10/2024



Estimate g/d of methane and CO₂ per sheep

- Rescaled to batch & population mean
- Accurate ranking of animals

Date	Time	Humidity	Temp
24/09/2024	07:28:40	68.8	
24/09/2024	07:29:10	71.9	
24/09/2024	07:29:40	71.6	
24/09/2024	07:30:10	71	
24/09/2024	07:30:40	70.7	
24/09/2024	07:31:10	70.7	
24/09/2024	07:31:40	71.1	
24/09/2024	07:32:10	71.5	
24/09/2024	07:32:40	72	
24/09/2024	07:33:10	72.7	
24/09/2024	07:33:40	73.3	
24/09/2024	07:34:10	73.9	
24/09/2024	07:34:40	74.6	11.6
24/09/2024	07:35:10	75.2	11.4
24/09/2024	07:35:40	75.8	11.3
24/09/2024	07:36:10	76.3	11.2
24/09/2024	07:36:40	76.9	11.1
24/09/2024	07:37:10	77.4	10.9
24/09/2024	07:37:40	78	10.8
24/09/2024	07:38:10	78.4	10.7
24/09/2024	07:38:40	78.9	10.6
24/09/2024	07:39:10	79.5	10.5

EID	DATE	LWT
826054276822007	10/10/2024	36.8
826054276822010	10/10/2024	39.4
826054276822016	10/10/2024	33.5
826054276822022	10/10/2024	39.3
826054276822023	10/10/2024	38
826054276822024	10/10/2024	35.1
826054276822025	10/10/2024	31.8
826054276822026	10/10/2024	36.6
826054276822028	10/10/2024	36.7
826054276822029	10/10/2024	36.6
826054276822031	10/10/2024	28.6
826054276822036	10/10/2024	41.3
826054276822037	10/10/2024	40.5
826054276822039	10/10/2024	38.4
826054276822040	10/10/2024	37.9
826054276822043	10/10/2024	38.4
826054276822047	10/10/2024	40



Combining data sets for maximum impact



- Genetic analysis of PAC data collected to date

- Texel data on 581 lambs
- UK maternal breed data on 13,649 sheep



h^2 estimates for CH₄ & CO₂
low to moderate



BREED FOR CHANGE
BREEDING LOW METHANE SHEEP

- Combined analyses in the pipeline:
 - **Rumen volume** & PAC measurements (UK/Ireland projects) → genetic correlation
 - **Feed intake** data (international) → genetic control and relationships with other traits
 - **Methane** (PAC) data (international) → genetic/ genomic control across popns; joint genetic evaluations
- Several papers at WCGALP 2026

Methane – an Irish perspective

GMG Sheep Meeting



Portable Accumulation Chamber (PAC)

Uses: rank animals on methane output



Removed from
feed 1 hr prior



Live-
weight
recorded

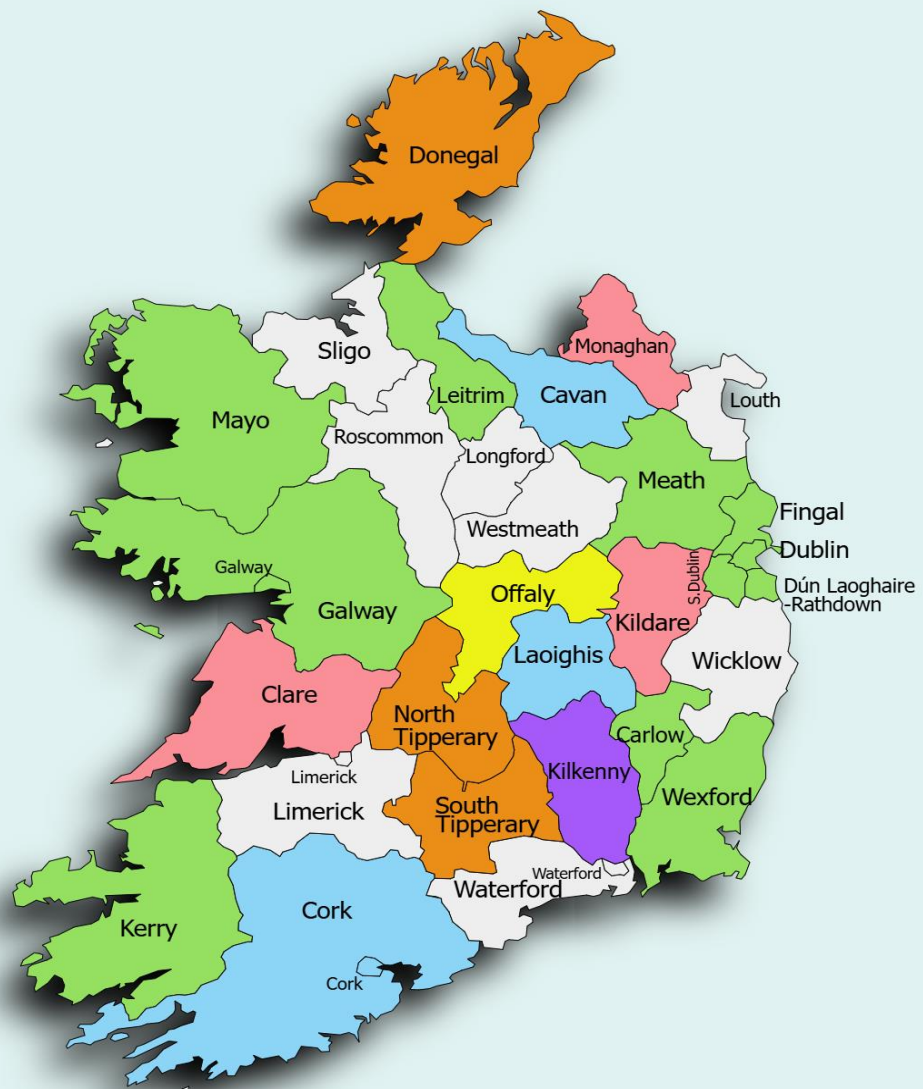


PAC
50mins



CH₄, CO₂ and O₂
at 0, 25 & 50
minutes

Flocks visited to date



Created with paintmaps.com



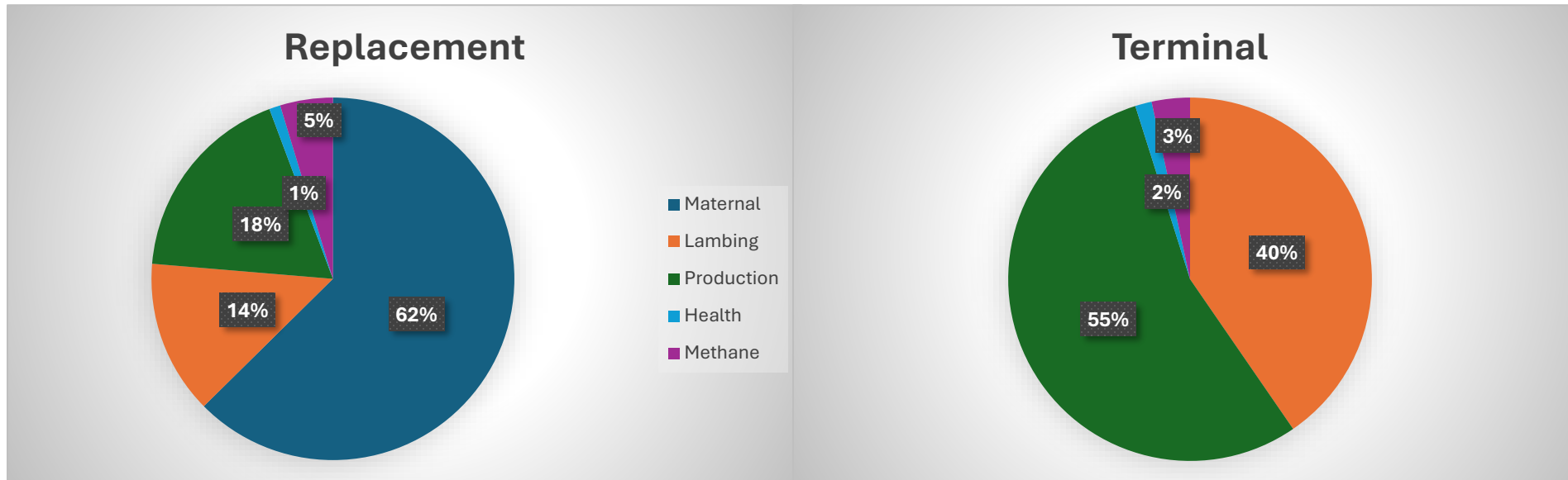
Genetics of methane

Records available ~19,000

Results:

- Heritable → 18 to 31%
- Repeatable → ~35%

National breeding objectives 2026



GreenFeed

Uses: methane profile
across production year



6 visits per animal
per day

4 hours between
each visit (diurnal
effect)

Each visit consist
of 8 feed drops

7.5g of meal in
each drop = 360g /
day (grass pellet)

30 seconds
between each
feed drop

Animal stands at
machine for 2-4
minutes per visit

Methane and
Carbon Dioxide
measured in each
visit

End of 2026 profile on ~260 animals

Future plans

- **PAC**: continue to measure methane on national flock → breeding indexes
- **GreenFeed**: build up dataset → national sheep inventory values
- Investigate correlation between PAC and GreenFeed measurements
- **Feed intake** → at pasture and indoors for estimate of methane yield

