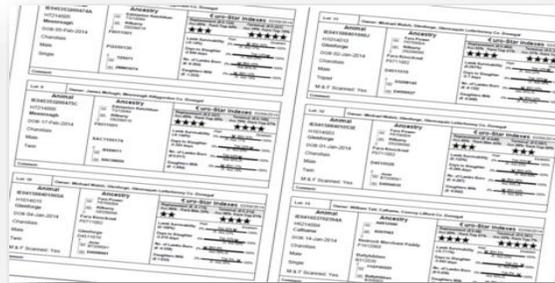


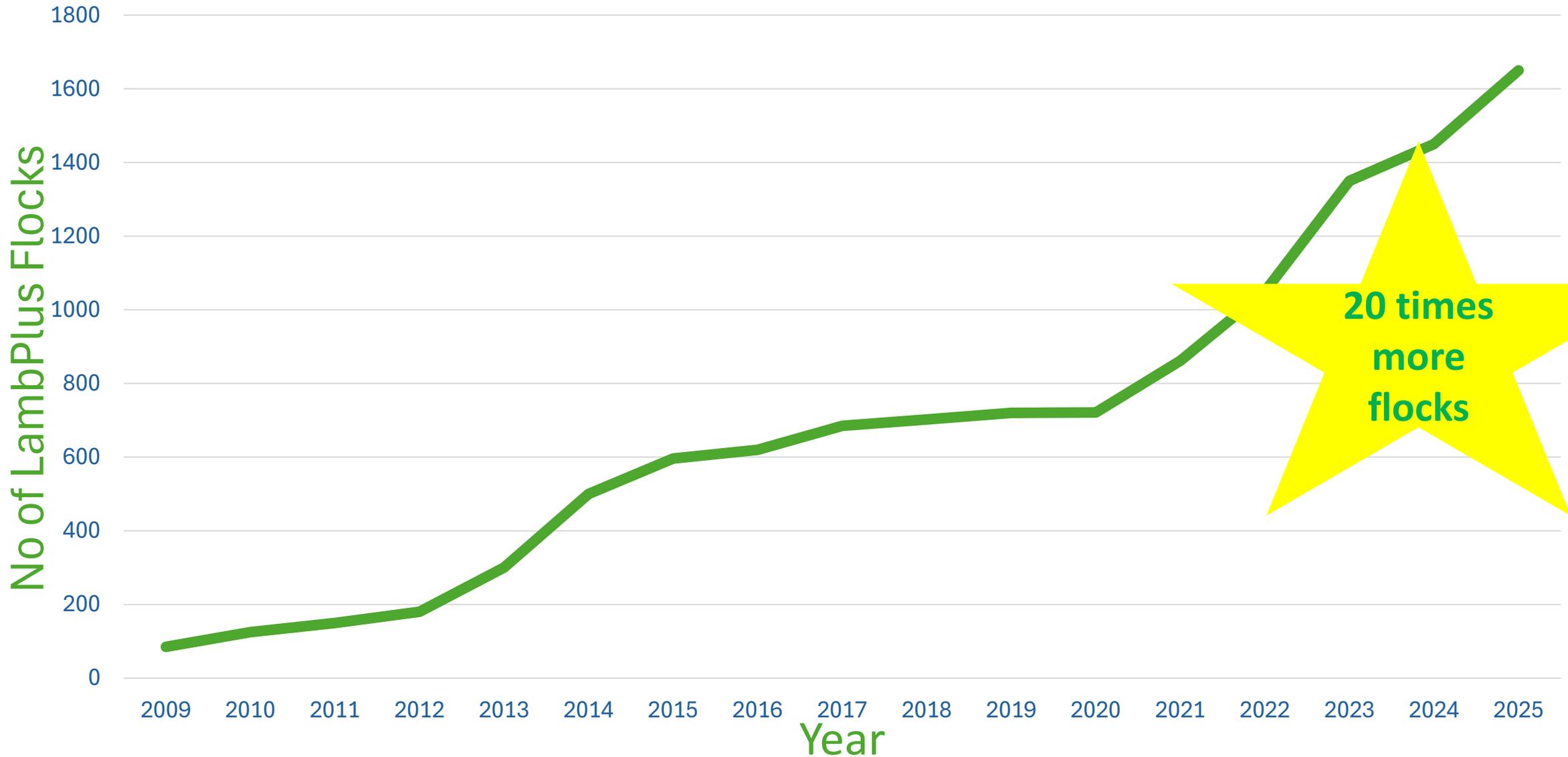


Sheep Ireland Industry Meeting

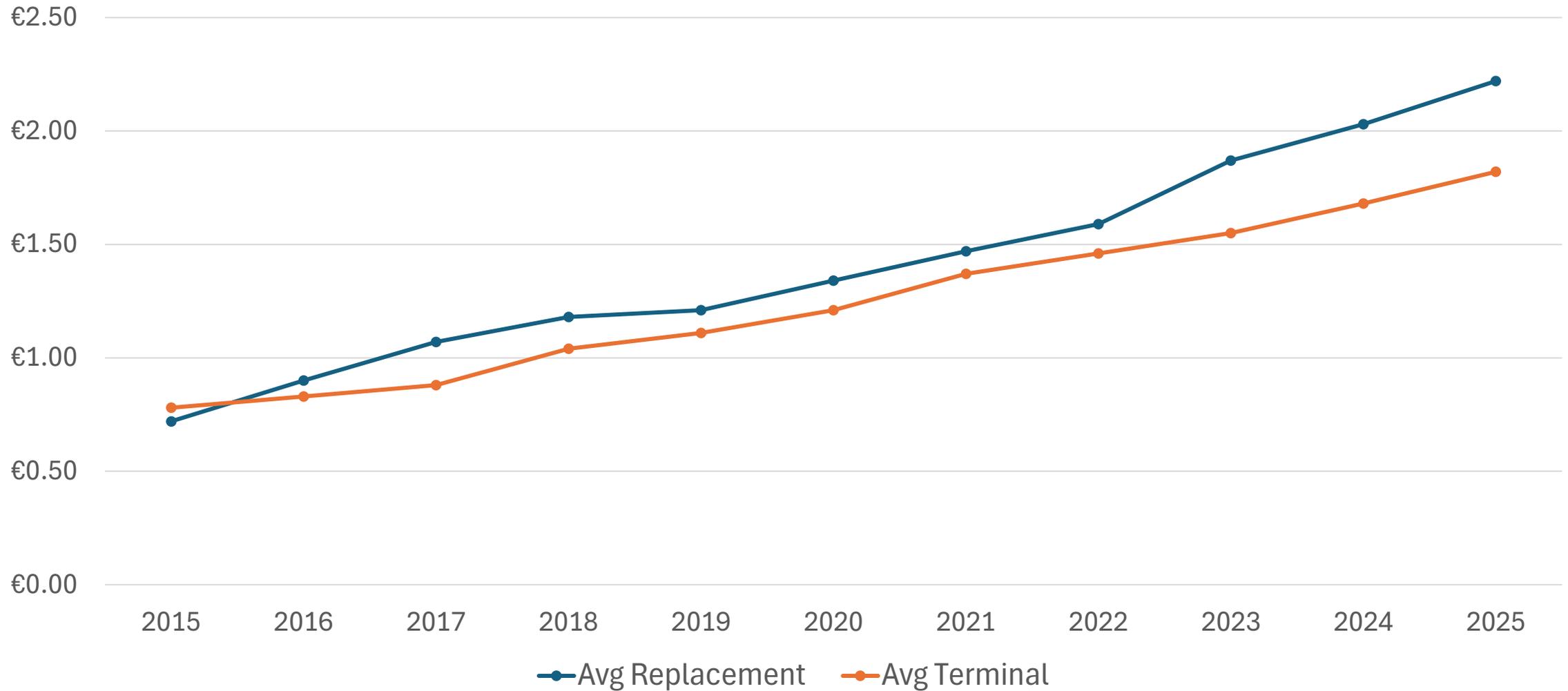


Thursday 11th December, 2025

Growth in LambPlus



Genetic Trend over past 10 years



Sheep Irelands 2025 network



Agenda

Presenter	Topic
Jaynell Anderson	Opening
Orla Keane	OVIFEC: Developing genetic parameters for worm resistance in sheep
Eoin Dunne	Collection of enteric methane data
Edel O Connor	Updating the economic values
Jonathan Herron	Life Cycle Assessment Model - carbon values
Noirin McHugh	Impact of changes to evaluations
Thierry Pabiou	Impact of changes to the stars
Panel discussion: All speakers, and farmers Flor Ryan and William Hutchinson	

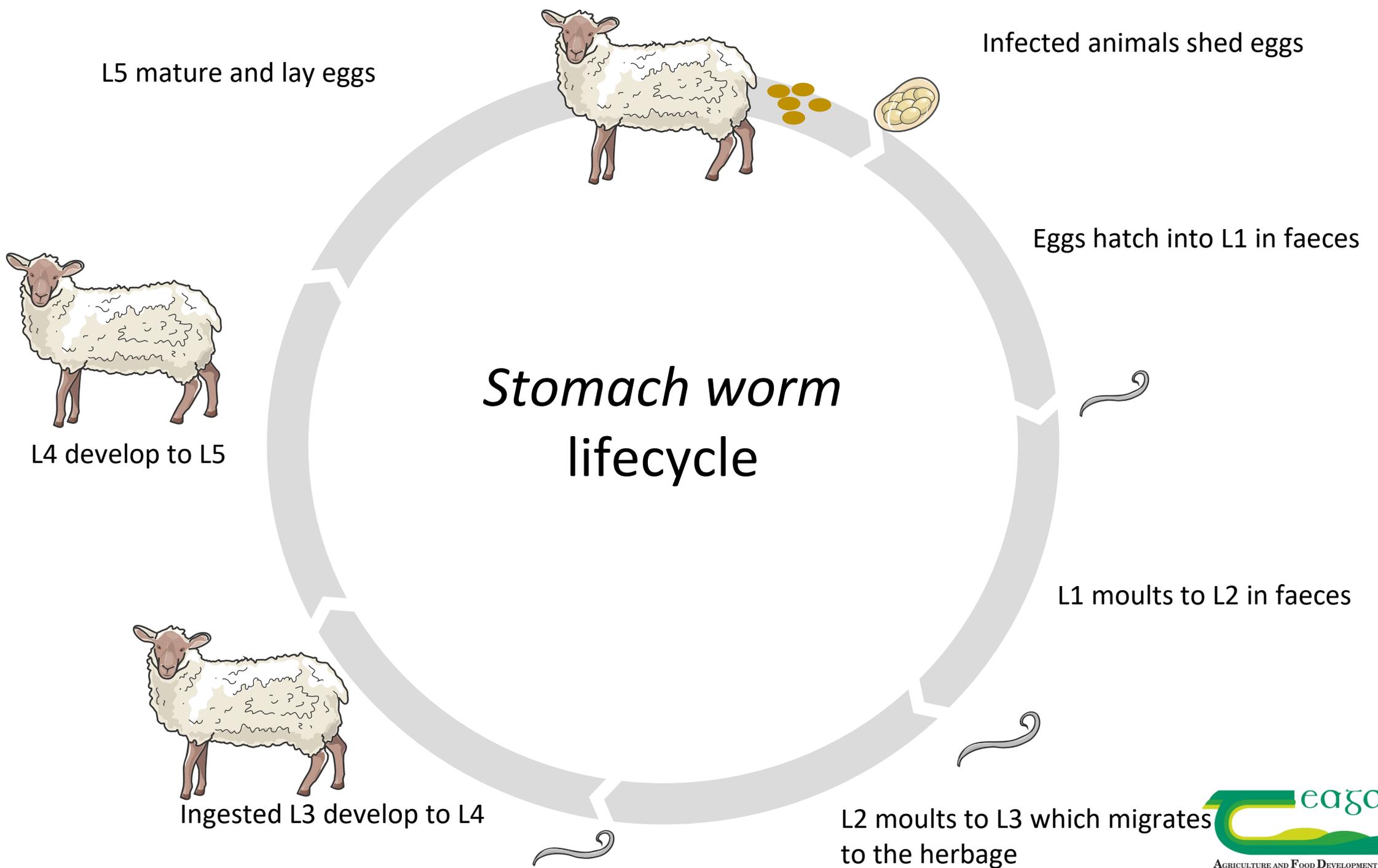
OVIFEC: Developing genetic parameters for worm resistance in sheep

Orla Keane



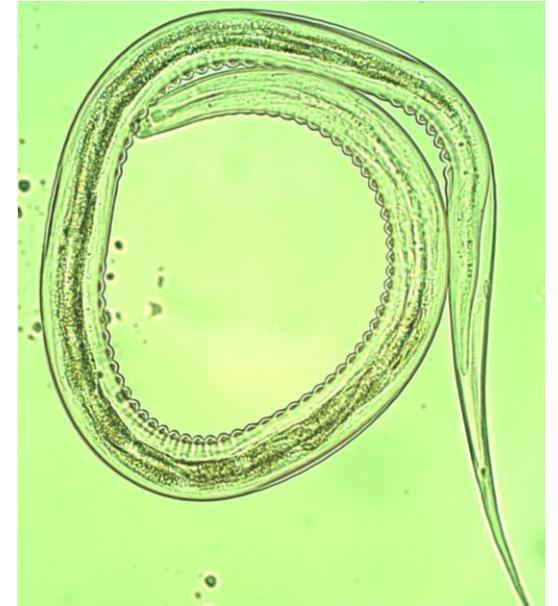
An Roinn Talmhaíochta,
Bia agus Mara
Department of Agriculture,
Food and the Marine



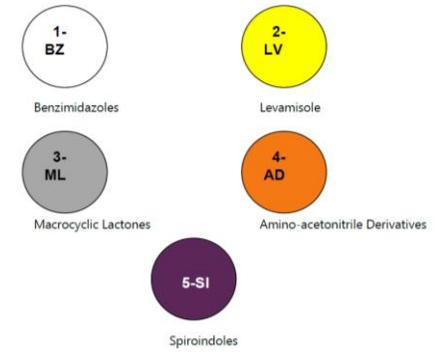


Gastrointestinal nematodes

- The most important production-limiting disease of lambs
 - Reduce feed intake
 - Loss of protein in the gut
 - Gut damage
 - Anaemia (*Haemonchus*)
 - Ill-thrift/death
- Many different species
- Typically controlled with anthelmintics
- Resistance to the commonly used wormers widespread

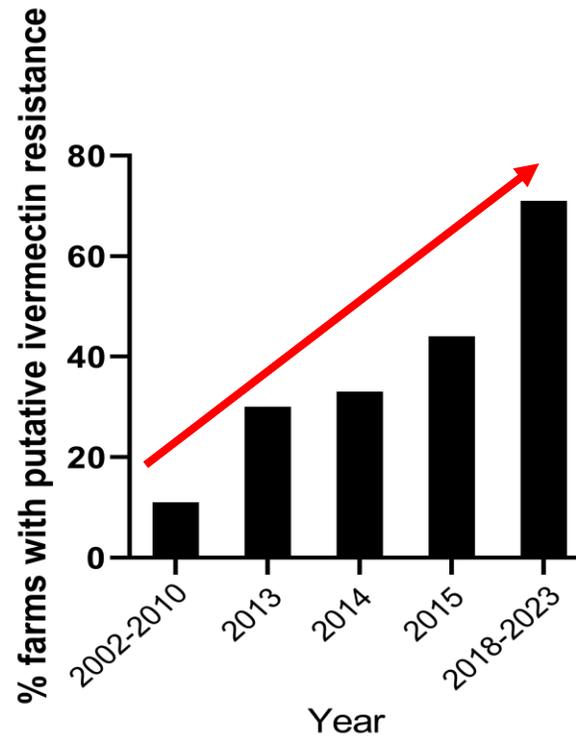


Farms with Anthelmintic Resistance



2018-2023

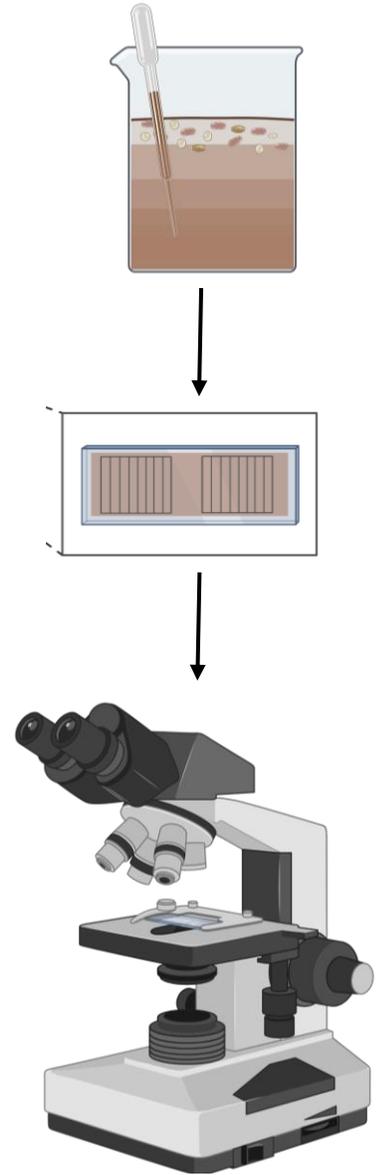
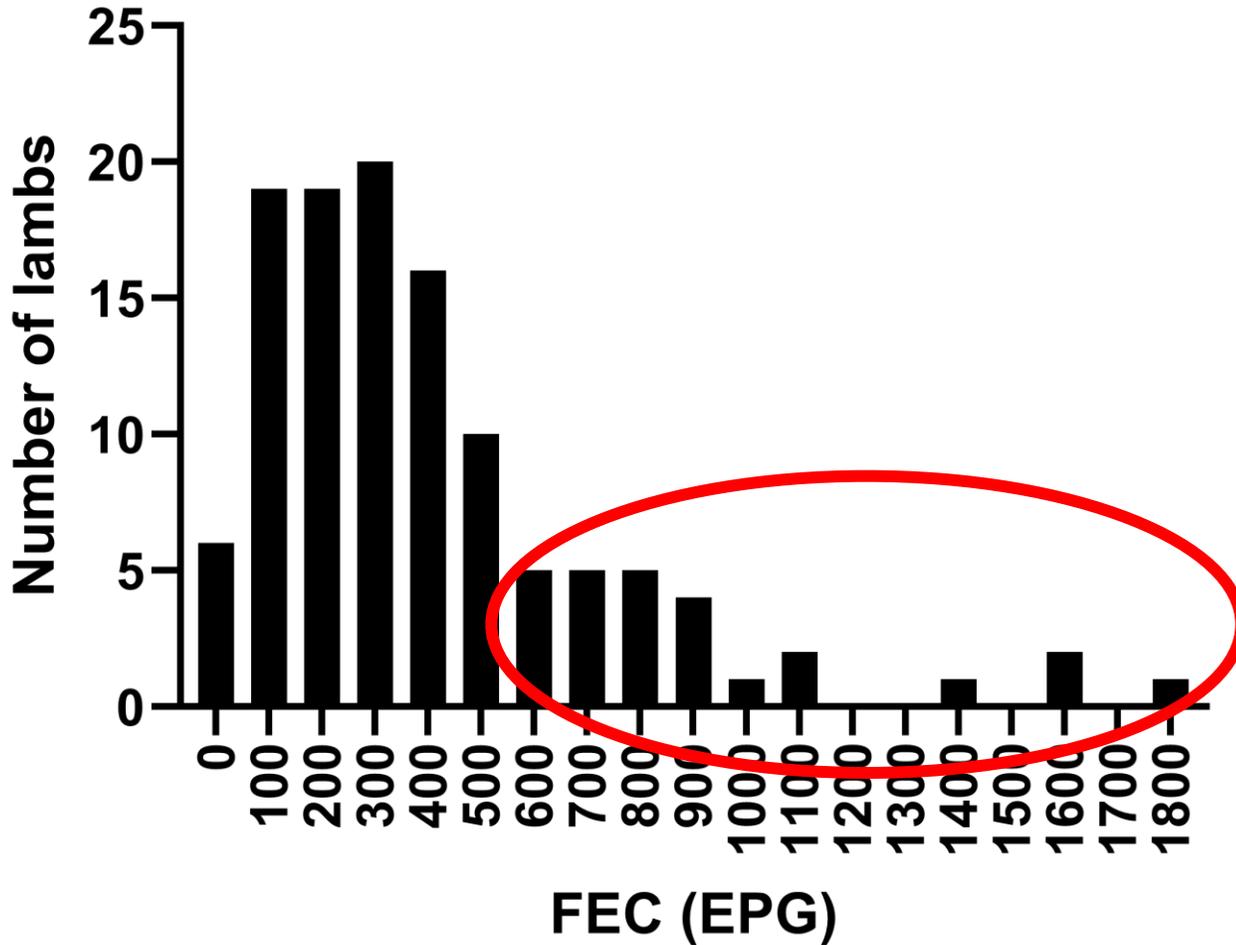
	White (1-BZ)	Yellow (2-LV)	Clear(3-ML)
Resistance	100%	45%	74%



Need to Reducing Reliance on wormers

- Grazing management
 - Mixed grazing/mixed age group grazing
 - Silage aftergrass
- Nutrition
- Bioactive crops
- **Breeding for host resistance**

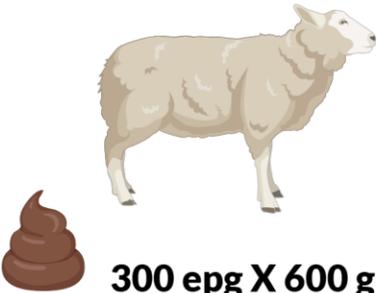
FEC Distribution within a flock



Pasture Larval Burden

Low FEC

High FEC



300 epg X 600 g



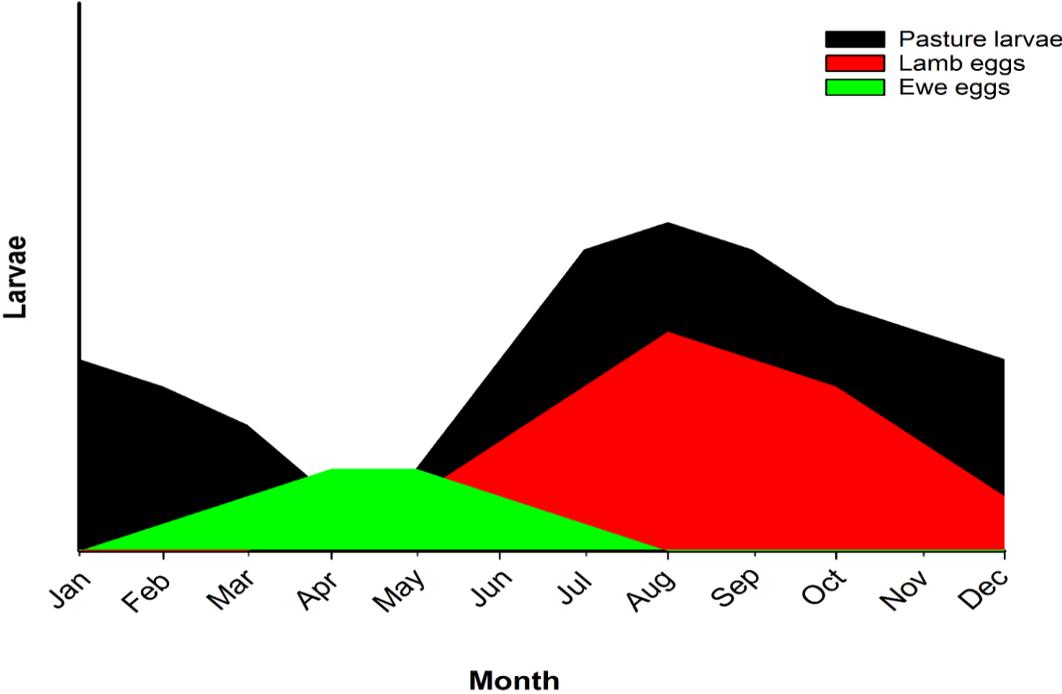
180,000 eggs/day



800 epg x 600 g

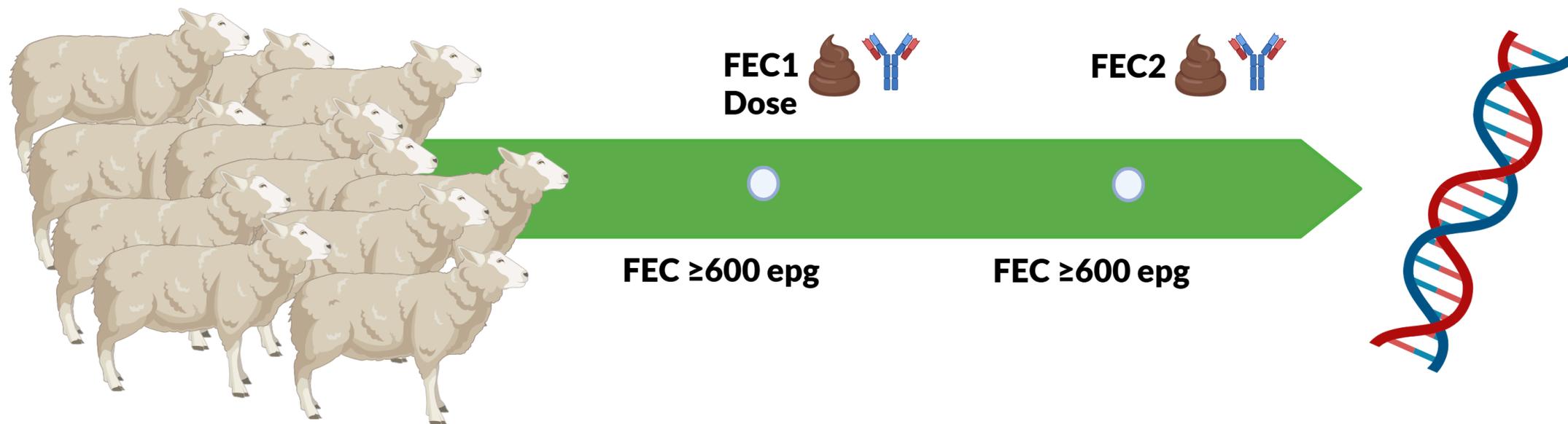


480,000 eggs/day



Phenotyping

CPT flocks
Research flocks



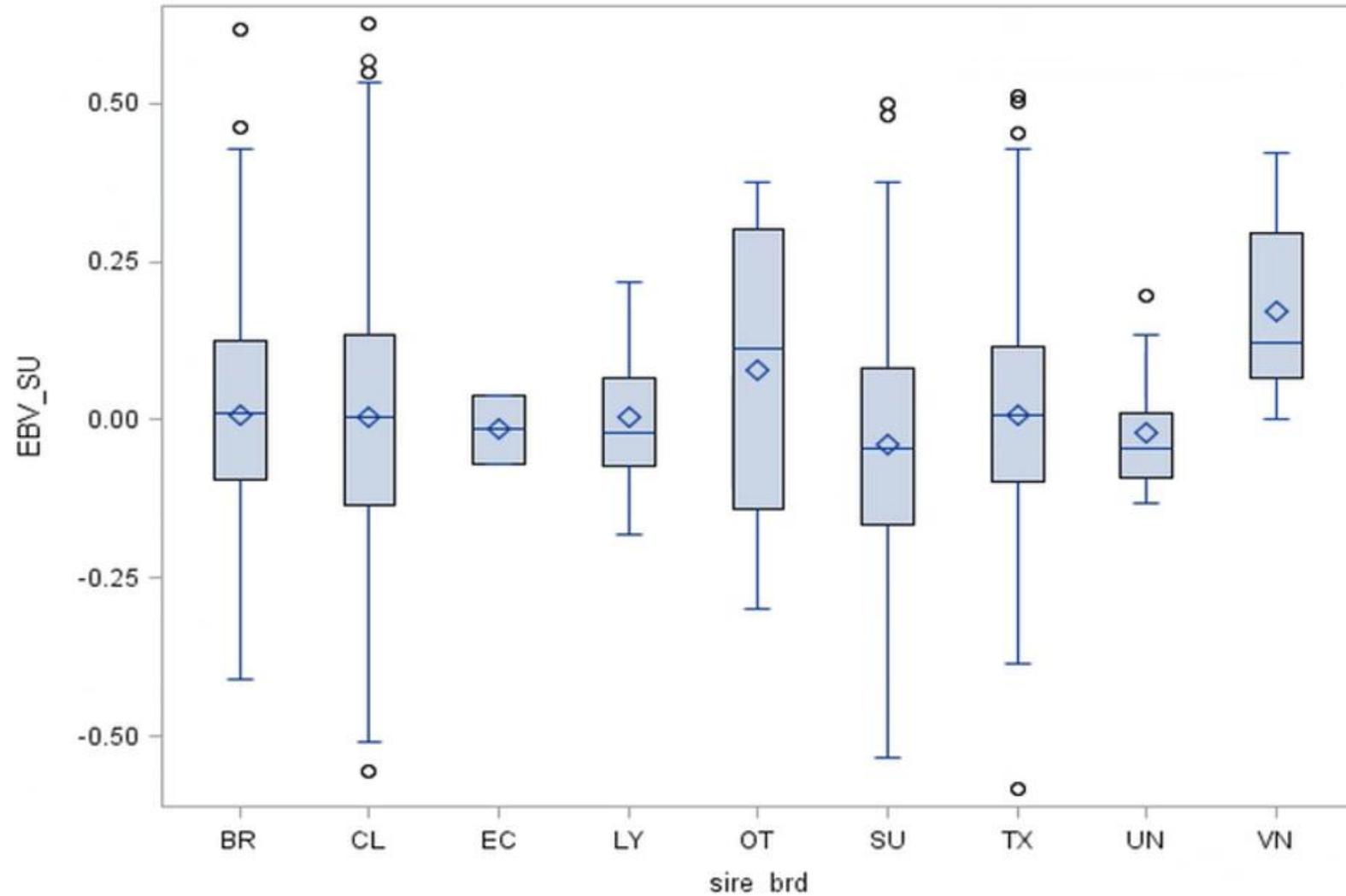
Genetic parameters

- Are the same genes influencing FEC1 and FEC2?
 - Genetic correlation between FEC1 and FEC2 = 0.96

Can use a single FEC measure in future

- How much of the of the variation between lambs is explained by genetics?
 - **Heritability = 6.6%**
- Large within breed variation for selection to act on
- Will we continue to phenotype?
 - **Ongoing phenotyping of CPT and research flocks to train the index**

Within breed variation



Conclusions

- Anthelmintic resistance is a major threat to grass-based lamb production
- Tools that reduce reliance on wormers are urgently required
- Breeding for low FEC sheep can reduce wormer requirement
 - Directly – Resistant animals harbour fewer worms
 - Indirectly - Resistant animals shed fewer eggs on pasture thus reducing the pasture larval burden
- Combining phenotyping with genotyping = maximise genetic gain

Acknowledgements

- Participating farmers
- Sheep Ireland staff
- Teagasc staff
- Department of Agriculture, Food and the Marine



An Roinn Talmhaíochta,
Bia agus Mara
Department of Agriculture,
Food and the Marine





Collection of Methane Data

Eoin Dunne

Sustainable Sheep Systems Technologist.

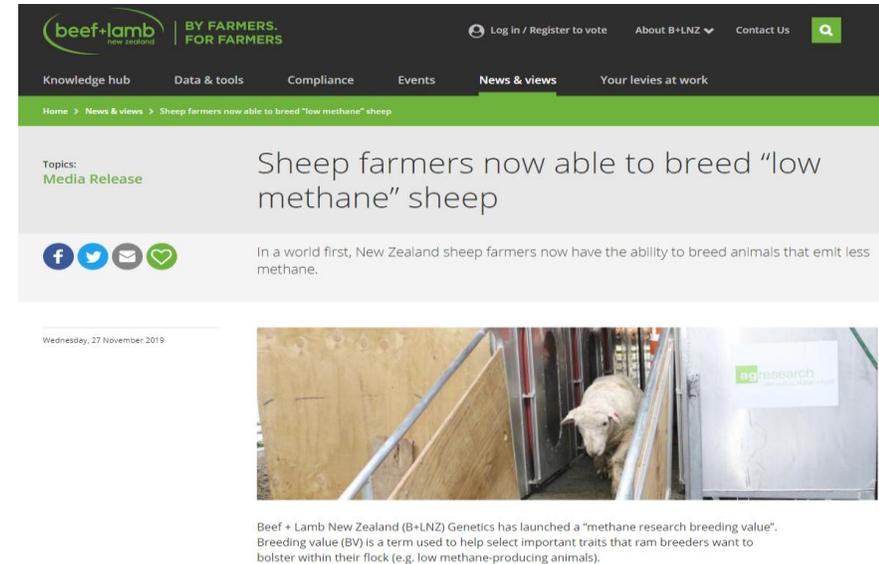
Teagasc, Athenry, Co Galway

eoin.dunne@teagasc.ie

Sheep Ireland Industry Meeting, 11th December 2025

Why measure methane in sheep?

- Increasing efficiency, productivity and profitability in the national flock
 - Identify high and low emitters in the flock
 - Refine Irelands inventory values
 - Reach our national environmental targets
 - 2030 - Reduce Irish Agricultural GHG emissions by 25%
- 
- Develop breeding values for methane



Methods of measuring methane

PAC



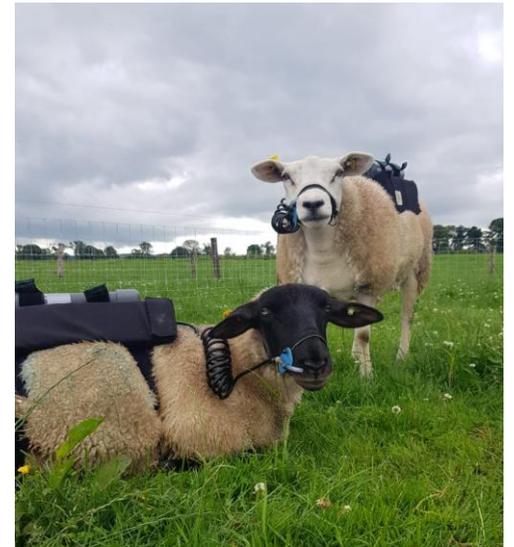
Respiration chamber



GreenFeed



SF₆



Portable Accumulation Chamber (PAC)

Methane measurements collected
using PAC



Animals in good
grass > 5cm



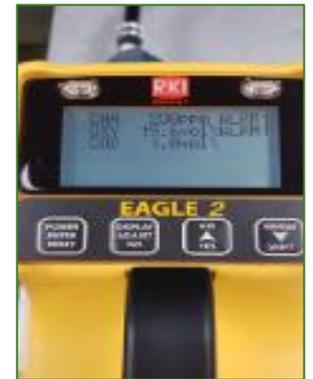
Removed from
feed 1 hr prior



Live-
weight
recorded



PAC
50mins



CH₄, CO₂ and O₂
at 0, 25 & 50
minutes



Farms visited to date



Created with paintmaps.com



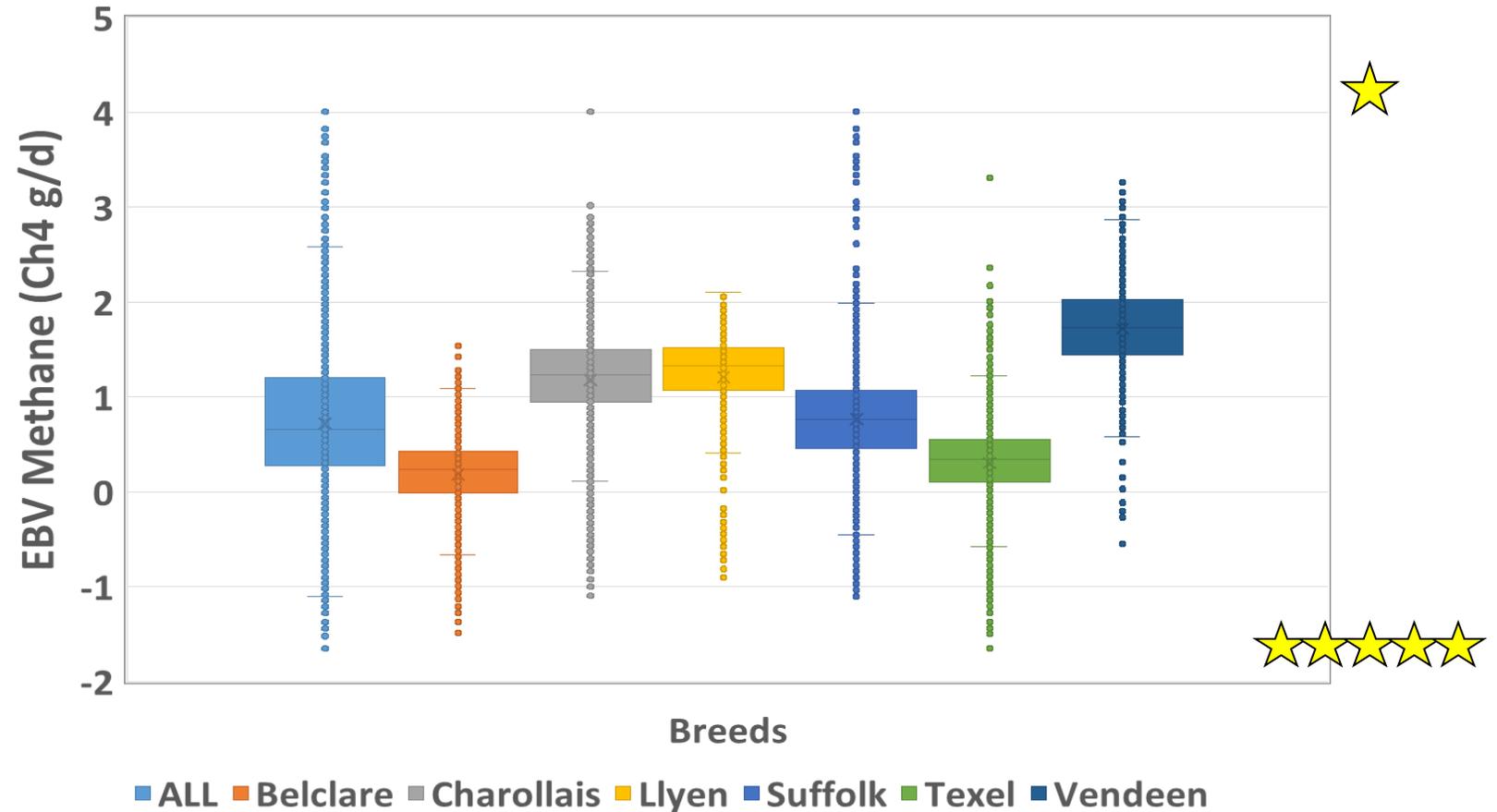
Genetics of methane

Variation between animals for methane?

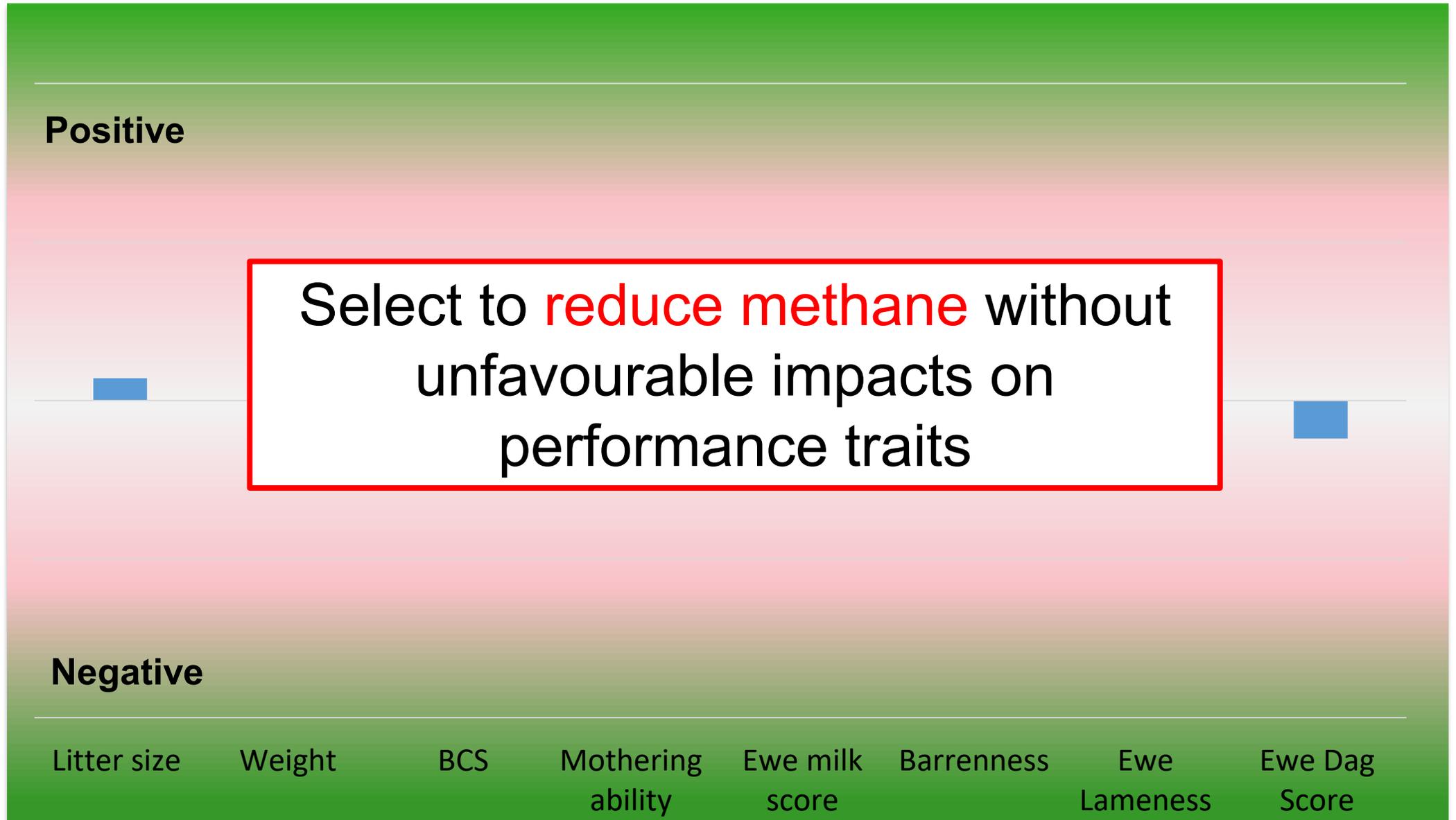
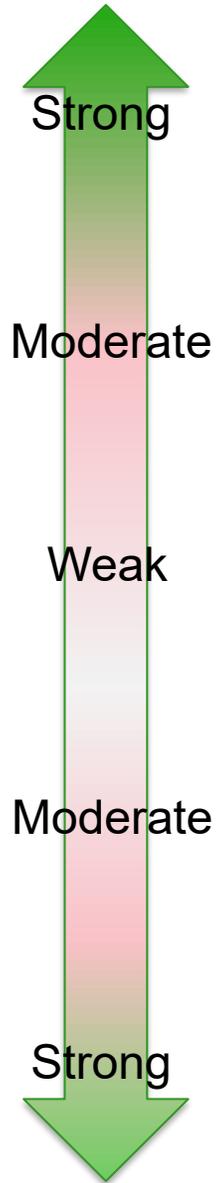
Records available ~19,000

Results to date:

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



Correlations with other traits





Thank you for listening!

Eoin Dunne

Sustainable Sheep Systems Technologist.

Teagasc, Athenry, Co Galway

eoin.dunne@teagasc.ie

Sheep Ireland Industry Meeting, 11th December 2025

Updating the economic values

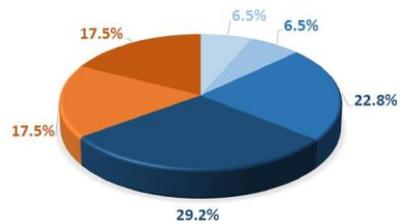


E. O' Connor, J. Herron, L. Shalloo, P. Creighton, F. McGovern, J. Anderson, L. Chipondoro and N. McHugh
Sheep Ireland Industry Meeting
11th December 2025

Indexes internationally

1. Desired gains

- Canada, UK



- Lamb survival dir (6.5%)
- Birth weight dir (6.5%)
- 50d weight dir (22.8%)
- Gain 50-100d (29.2%)
- Loin eye depth (17.5%)
- Fat (17.5%)



	Terminal Sire (CT Index)	Terminal Sire (Non-CT Index)	Maternal Index
Eight Week Weight EBV	0.1	0.9	2.8
Scan Weight EBV	0.85	0.8	0.1
Muscle Depth EBV	0.8	2.5	2
Fat Depth EBV	0.5	0.5	0.5
Litter Size Born EBV	0	0	14
Litter Size Reared EBV	0	0	37
Maternal Ability EBV	0	0	5
CT Lean Weight EBV	4.5	0	0
Ct Fat Weight EBV	1	0	0
CT Gigot EBV	0.1	0	0

2. Economic values

- UK, New Zealand, Australia

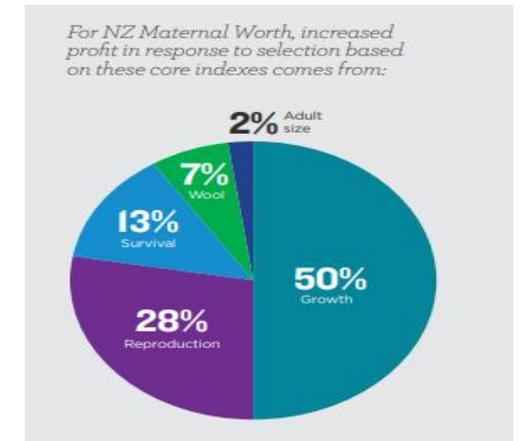
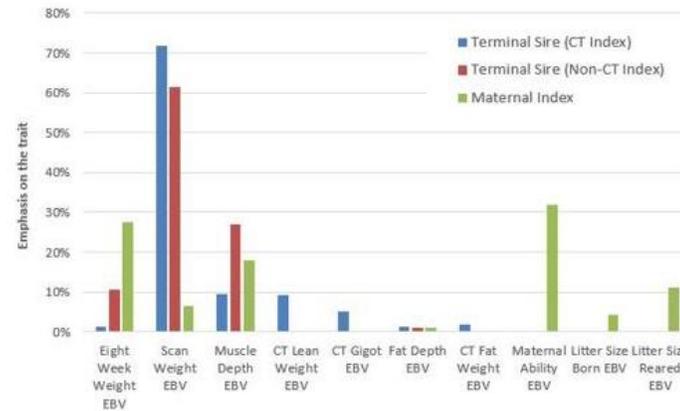
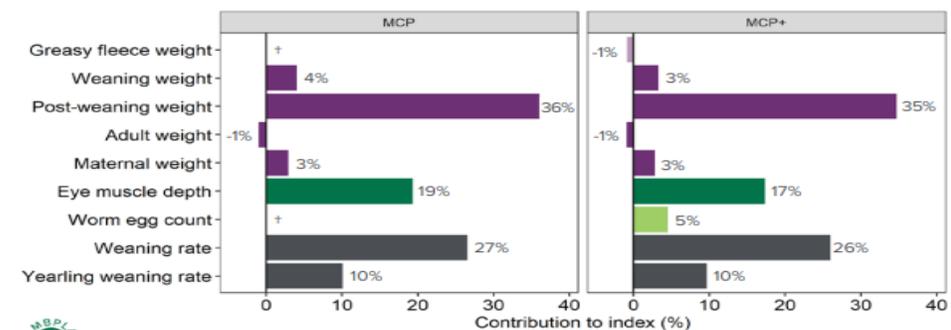


Figure 2: The traits in the MCP and MCP+ indexes and how they contribute to the overall balance of the indexes in the top 10% of current maternal breed and composite progeny



Euro-Star indexes

EuroStars		02-DEC-2025
REPLACEMENT: €5.02	TERMINAL: €2.70	
Top 1% Acc 100%	Top 2% Acc 74%	
★★★★★	★★★★★	
Lamb Survivability: 1.42%		Top 1%
Days to Slaughter: 104 days		

Economic Value

Genetic Component



Breeding Values



Bio-economic model

Teagasc Lamb Production Model

Computer simulation of a sheep farm

To determine the effect of system changes on profitability

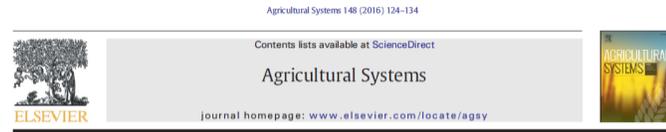
Whole-farm model

Stimulates a 12 month production cycle – beginning at mating



Bio-economic model

Validated against Teagasc e-profit monitor flocks



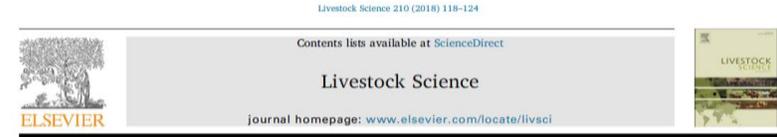
Description and validation of the Teagasc Lamb Production Model

A. Bohan^{a,b,*}, L. Shalloo^a, B. Malcolm^{d,e}, C.K.M. Ho^d, P. Creighton^c, T.M. Boland^b, N. McHugh^a

^a Animal & Grassland Research and Innovation Centre, Teagasc, Moorepark, Fermoy, Co. Cork, Ireland
^b School of Agriculture & Food Science, University College Dublin, Ireland
^c Animal & Grassland Research and Innovation Centre, Teagasc, Athlery, Co. Galway, Ireland
^d Department of Economic Development, Jobs, Transport and Resources, Carlton, Vic. 3053, Australia
^e University of Melbourne, Vic. 3010, Australia

ARTICLE INFO ABSTRACT

Effect of stocking rate and prolificacy



Investigating the role of stocking rate and prolificacy potential on profitability of grass based sheep production systems

A. Bohan^{a,b,*}, L. Shalloo^a, P. Creighton^c, E. Earle^{b,c}, T.M. Boland^b, N. McHugh^a

^a Animal & Grassland Research and Innovation Centre, Teagasc, Moorepark, Fermoy, Co. Cork, Ireland
^b School of Agriculture & Food Science, University College Dublin, Ireland
^c Animal & Grassland Research and Innovation Centre, Teagasc, Athlery, Co. Galway, Ireland

Effect of genetic merit



Article
Investigating How Genetic Merit and Country of Origin Impact the Profitability of Grass-Based Sheep Production Systems

Nicola Fetherstone^{1,2}, Fiona M. McGovern^{1,*}, Noirín McHugh³, Tommy M. Boland² and Alan Bohan⁴

¹ Animal and Grassland Research and Innovation Centre, Teagasc, Mellows Campus, Athlery, Co., Galway H65 B718, Ireland
² School of Agricultural Science, University College Dublin, Dublin D04 V1W8, Ireland
³ Animal and Grassland Research and Innovation Centre, Teagasc, Moorepark, Fermoy, Co., Cork P61 P302, Ireland
⁴ Teagasc Advisory and Education, Ballymore, Carrowranny, Co., Sligo F56 A585, Ireland
* Correspondence: fiona.mcgovern@teagasc.ie; Tel: +353-871-263873

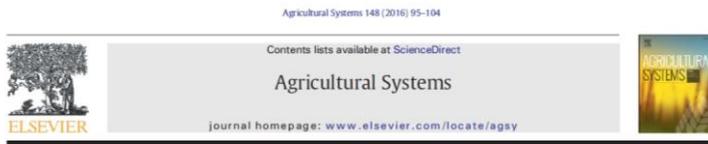


Modelling the production, profit, and greenhouse gas emissions of Irish sheep flocks divergent in genetic merit

L. Farrell^{a,b}, J. Herron^b, T. Pabiou^c, N. McHugh^b, K. McDermott^c, L. Shalloo^b, D. O'Brien^d, A. Bohan^e

^a Teagasc Animal & Grassland Research and Innovation Centre, Mellows Campus, Athlery, H65 B7, Co. Galway, Ireland
^b Animal & Grassland Research and Innovation Centre, Teagasc, Moorepark, Fermoy, P61 C996 Co. Cork, Ireland
^c Sheep Ireland, Highfield House, Slinagh, Bandon P22 X050, Co. Cork, Ireland
^d Crags, Environment and Land Use Research Centre, Teagasc, Johnstown Castle, Co. Wexford, Ireland

Carbon modelling

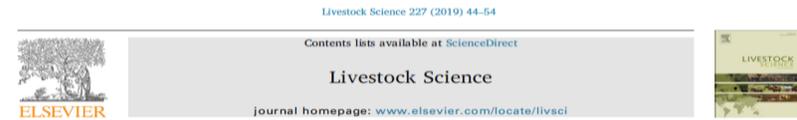


A life cycle assessment of the effect of intensification on the environmental impacts and resource use of grass-based sheep farming

D. O'Brien^{a,b,*}, A. Bohan^b, N. McHugh^b, L. Shalloo^a

^a Livestock Systems Research Department, AGRI, Teagasc, Moorepark, Fermoy, Co. Cork, Ireland
^b Animal & Bioscience Research Department, AGRI, Teagasc, Moorepark, Fermoy, Co. Cork, Ireland

Generation of economic values



Deriving economic values for national sheep breeding objectives using a bio-economic model

A. Bohan^{a,b,*}, L. Shalloo^a, P. Creighton^c, D.P. Berry^a, T.M. Boland^b, A.C. O'Brien^a, T. Pabiou^d, E. Wall^d, K. McDermott^d, N. McHugh^a

^a Animal & Grassland Research and Innovation Centre, Teagasc, Moorepark, Fermoy, Co. Cork, Ireland
^b School of Agriculture & Food Science, University College Dublin, Belfield Dublin 4, Ireland
^c Animal & Grassland Research and Innovation Centre, Teagasc, Athlery, Co. Galway, Ireland
^d Sheep Ireland, Highfield House, Slinagh, Bandon P22 X050, Co. Cork, Ireland

Bio-economic model



Flock net energy

Grass, silage,
concentrates

- Lambing pattern
- Land and capital
- Livestock
- Production
- Animal health
- Sales
- Variable costs
- Fixed costs
- Labour

Inputs



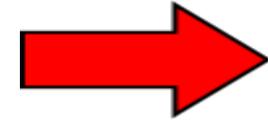
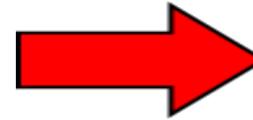
Outputs

Financial

Economic

Physical

Net profit



Objective

1. Update the model including variable costs



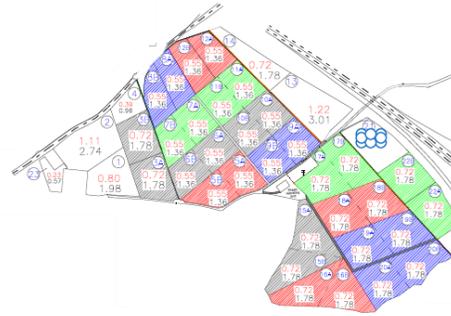
2. Recalculate the economic values for key traits within the indexes

EuroStars		12-AUG-2024
REPLACEMENT: €2.52	TERMINAL: €2.89	
Top 7% Acc 79%	Top 7% Acc 80%	
★★★★★	★★★★★	
Lamb Survivability: 1.80%	Progress bar	Top 4%
Days to Slaughter: -18.9 days	Progress bar	Top 13%
No. Lambs Born: -0.05	Progress bar	Top 44%
Daughter Milk: 0.1 kg	Progress bar	Top 13%

System modelled



107 ewes



13.27 ha - stocked at 7.50 ewes/ha



Scanning rate: 1.70 lambs per ewe



Mean lambing date: Early March



Weaning rate: 1.48 lambs per ewe

Updating Variable Costs

Current version: average costs of 5 years from 2010 to 2014

New version: average costs of 4 years from 2020 to 2023

Costs in line with Teagasc Dairy and Beef models

Variable cost	Source
Silage harvesting	FCI contracting charges guide, Teagasc reports
0-7-30 cost per tonne	CSO
18-6-12 cost per tonne	CSO
CAN cost per tonne	CSO
Urea cost per tonne	CSO
Lime cost per tonne	Co-ops
Reseeding cost per ha	Teagasc reports
Labour (per hour)	Job advertisements

All increased

Updating Variable Costs

Sheep specific variable costs

Variable cost	Source
Opportunity cost of land 	Teagasc/SCSI Agricultural Land Market Review & Outlook 2025
Concentrates lamb 	CSO
Concentrates ewes 	CSO
Wool price per kg 	Wool reports
Lamb price 	European Commission

Traits investigated

Trait Group	Objective trait	Unit
Maternal	Number of lambs born	lamb born
	Ewe mature weight	kg
	Ewe barrenness	%
Lambing	Lambing difficulty single	%
	Lambing difficulty single - maternal	%
	Lambing difficulty multiple	%
	Lambing difficulty multiple - maternal	%
	Lamb survival to birth	lamb surviving at birth
	Lamb vigour	Score from 1 to 5
	Mothering ability	Score from 1 to 5
Production	Days to slaughter	days
	Ewe milk	kg
	Carcass conformation	grade
	Carcass fat	score from 1 to 5
Health	Lameness ewe	%
	Lameness lamb	%
	Dag score	dag score from 1 to 5
	FEC	eggs per gram

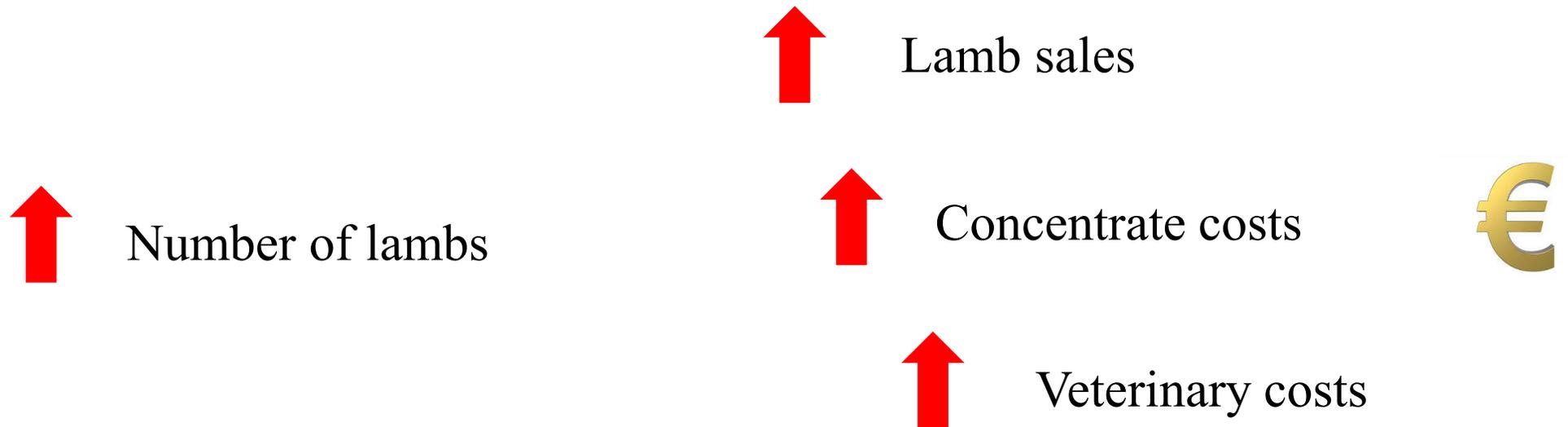
Economic value



- Modelled a one unit increase in each individual trait independently while holding all other traits constant
- The difference in net profit between the changed and default scenario

Number of lambs born

- Measurement of all the lambs the ewe gives birth to including dead and alive lambs per lambing
- **The value of one additional lamb surviving past 48 hours**





Conclusion

- Economic values have increased
- Increased production costs and lamb price are driving the increase



Carbon values

Jonathan Herron

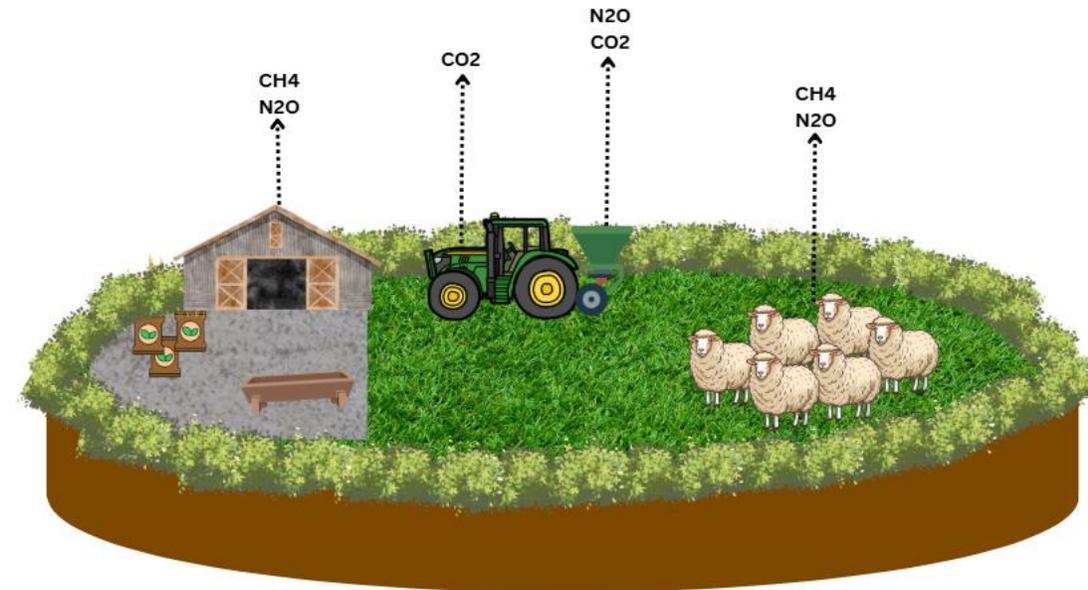
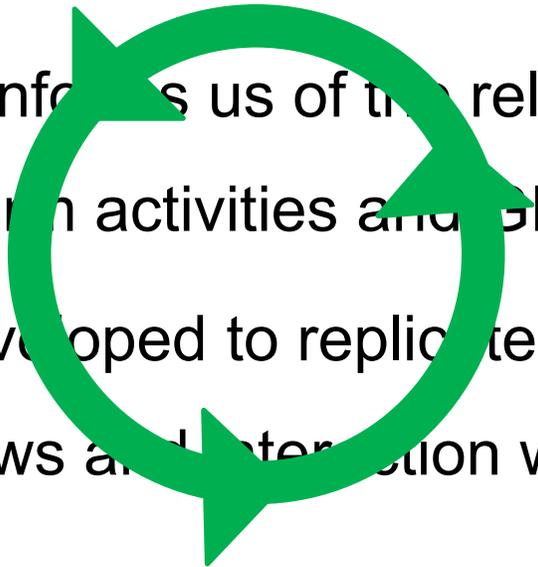
Teagasc, AGRIC, Moorepark, Fermoy, Co Cork.

Phone: 025 42 306

Email: jonathan.herron@teagasc.ie

How to calculate GHG emissions

- GHG emissions from agriculture
 - Numerous sources
 - Large variation in sources
- Research informs us of the relationships between farm activities and GHG emissions
- Models developed to replicate farm activities, nutrient flows and water retention within a farming system



Bio-economic model



Flock net energy

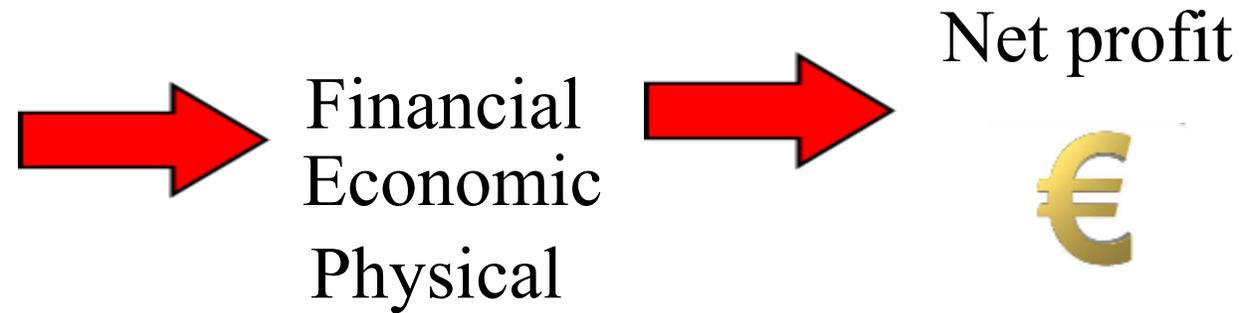
Grass, silage,
concentrates

Inputs



- Lambing pattern
- Land and capital
- Livestock
- Production
- Animal health
- Sales
- Variable costs
- Fixed costs
- Labour

Outputs



Description and validation of the Teagasc Lamb Production Model

A. Bohan^{a,b,*}, L. Shalloo^a, B. Malcom^{d,e}, C.K.M. Ho^d, P. Creighton^c, T.M. Boland^b, N. McHugh^a

^a Animal & Grassland Research and Innovation Centre, Teagasc, Moorepark, Fermoy, Co. Cork, Ireland
^b School of Agriculture & Food Science, University College Dublin, Ireland
^c Animal & Grassland Research and Innovation Centre, Teagasc, Atheny, Co. Galway, Ireland
^d Department of Economic Development, Jobs, Transport and Resources, Carlton, Vic. 3053, Australia
^e University of Melbourne, Vic. 3010, Australia

ARTICLE INFO

ABSTRACT



Deriving economic values for national sheep breeding objectives using a bio-economic model

A. Bohan^{a,b,*}, L. Shalloo^a, P. Creighton^c, D.P. Berry^b, T.M. Boland^b, A.C. O'Brien^b, T. Pabiou^d, E. Wall^d, K. McDermott^d, N. McHugh^a

^a Animal & Grassland Research and Innovation Centre, Teagasc, Moorepark, Fermoy, Co. Cork, Ireland
^b School of Agriculture & Food Science, University College Dublin, Belfield Dublin 4, Ireland
^c Animal & Grassland Research and Innovation Centre, Teagasc, Atheny, Co. Galway, Ireland
^d Sheep Ireland, Highfield House, Slough, Bundles P22 X 050, Co. Cork, Ireland

Life Cycle Assessment

Goal

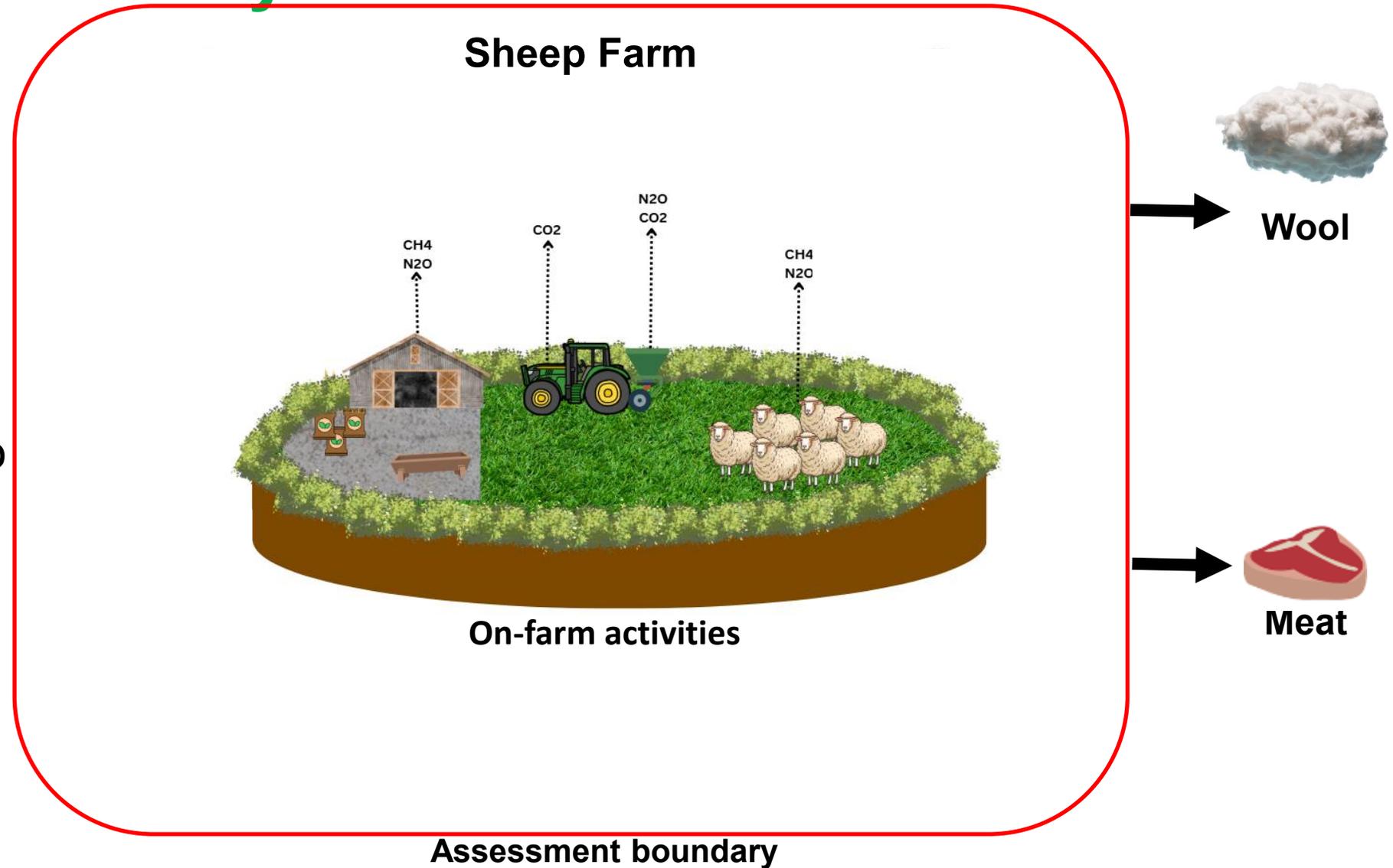
To calculate GHG emissions released from a sheep farm

Scope

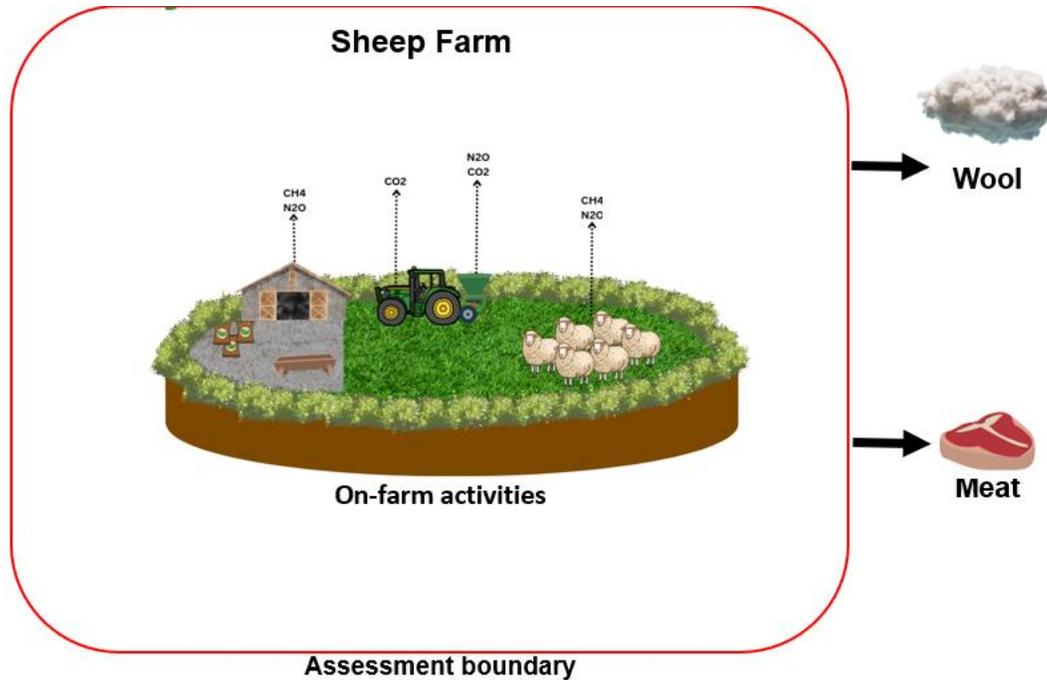
Cradle to farm gate – all GHG emission up to point product leaves the farm.

Type of emissions

- **Animal emissions**
- **General farm emissions**



Modelling GHG emissions



Teagasc sheep LCA model is an extension of the Teagasc sheep bioeconomic model

Allow calculation of both economic performance and GHG emissions at the same time

Agricultural Systems 148 (2016) 95–104

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journal homepage: www.elsevier.com/locate/agsy

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CrossMark

A life cycle assessment of the effect of intensification on the environmental impacts and resource use of grass-based sheep farming

D. O'Brien ^{a,*}, A. Bohan ^b, N. McHugh ^b, L. Shalloo ^a

^a Livestock Systems Research Department, AGRIC, Teagasc, Moorepark, Fermoy, Co. Cork, Ireland
^b Animal & Bioscience Research Department, AGRIC, Teagasc, Moorepark, Fermoy, Co. Cork, Ireland

Teagasc National Sheep Conferences 2023 | 13

Greenhouse gas intensity of average sheep systems in Ireland

Jonathan Herron
 Teagasc, Animal & Grassland Research and Innovation Centre, Moorepark, Fermoy, Co. Cork

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^a Teagasc Animal & Grassland Research and Innovation Centre, Mellows Campus, Athenry, H65 R7, Co. Galway, Ireland
^b Animal & Grassland Research and Innovation Centre, Teagasc, Moorepark, Fermoy, P61 C996 Co. Cork, Ireland
^c Sheep Ireland, Highfield House, Shinagh, Bandon P72 X050, Co. Cork, Ireland
^d Crops, Environment and Land Use Research Centre, Teagasc, Johnstown Castle, Co. Wexford, Ireland

Sheep Euro –star index

- Index aimed at helps farmers in the selection of more profitable breeding animals
 - Replacement Index
 - Terminal Index.
- Two index to maximize the use of the correct genetics for the right purpose
- **The weighting on each trait in a breeding objective is called the economic value**
- **Economic value**
 - Change in profit per unit change in the trait under investigation holding all other traits constant
- **Derived from the Teagasc Lamb Production Model bio-economic model (TLPM)**
- **Routinely updated where necessary**
 - Price of products change
 - Costs of production change
 - EU policy changes

Carbon value

Economic value

Change in profit per unit change in the trait under investigation holding all other traits constant

Carbon Value

Change in **total emissions** per unit change in the trait under investigation holding all other traits constant

- **Only traits that impact productivity and therefore GHG emissions have a carbon value**
- **Total carbon value is converted to an economic value by a price per tonne of carbon**

Deriving carbon value

CH₄

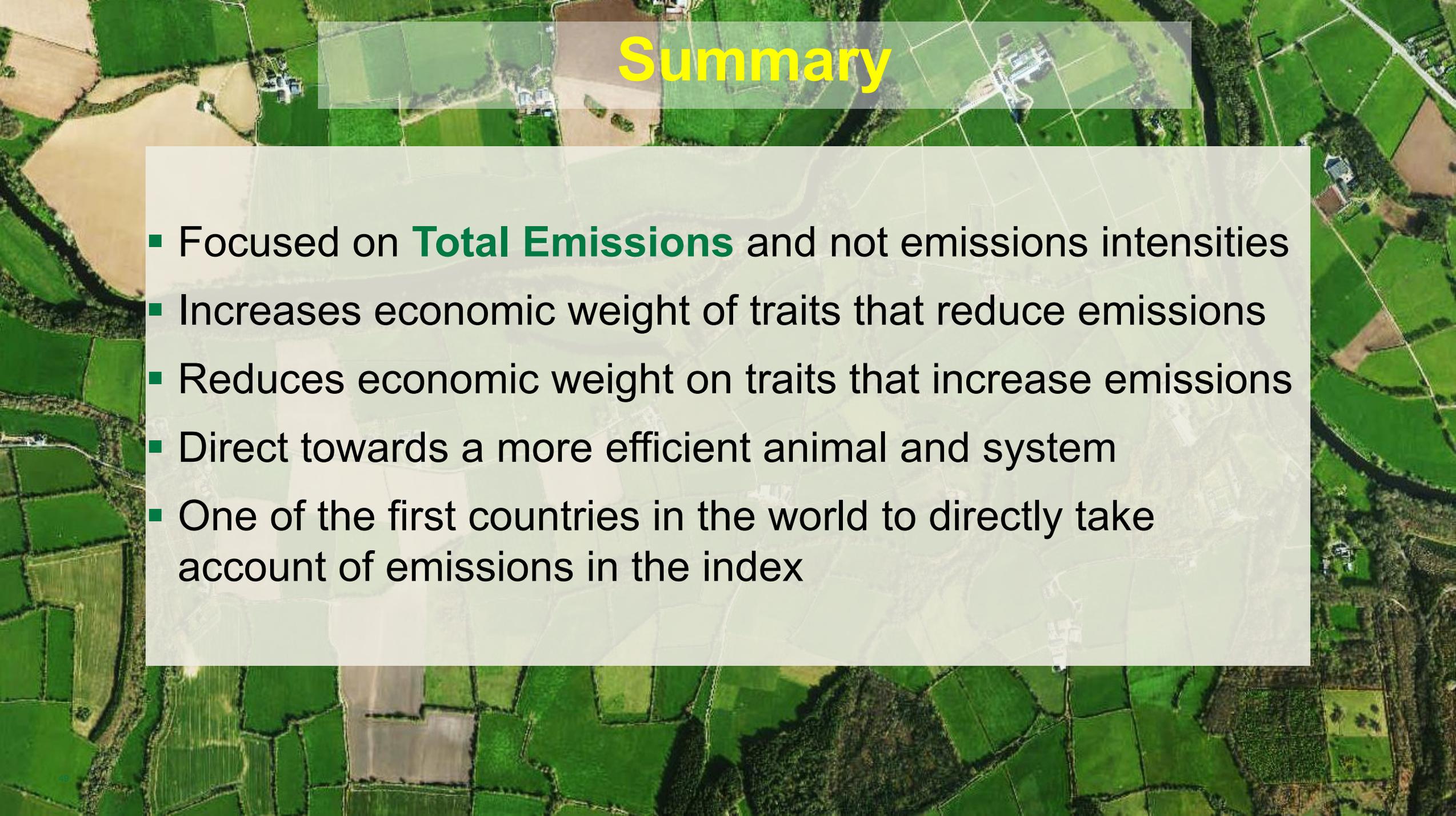
Measured methane



Change * €80/tonne CO₂eq



Carbon value for trait



Summary

- Focused on **Total Emissions** and not emissions intensities
- Increases economic weight of traits that reduce emissions
- Reduces economic weight on traits that increase emissions
- Direct towards a more efficient animal and system
- One of the first countries in the world to directly take account of emissions in the index



Impact of changes

Sheep Ireland Industry Meeting
11th December 2025



Updates for 2026

1. Economic and carbon values

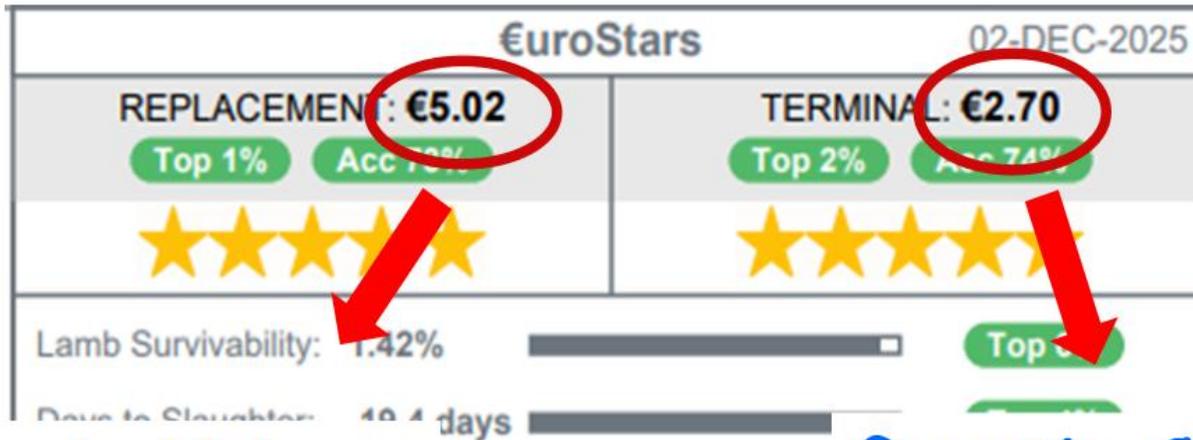
- Update current costs and prices in the bio-economic model
- Added carbon cost to some traits

2. Addition of new traits

- FEC
- Methane

Updates

€uro-Star indexes



Update economic & carbon

Economic Value

Genetic Component

€

Breeding Values

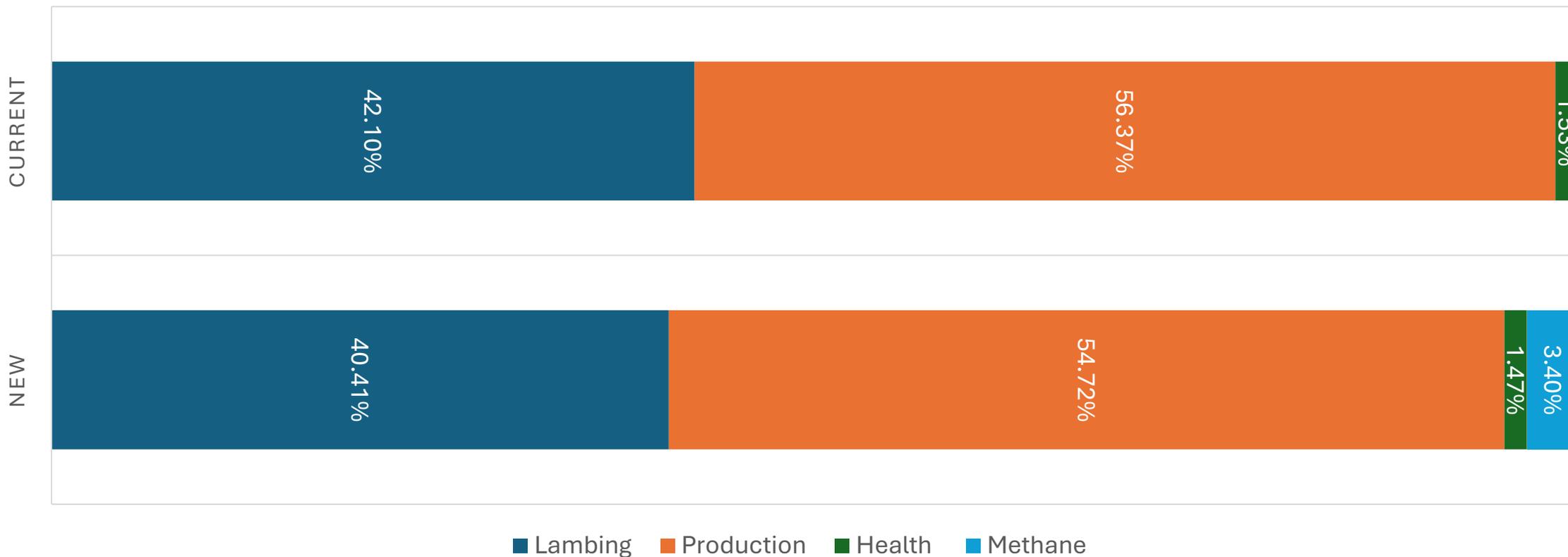


New traits

Relative Emphasis

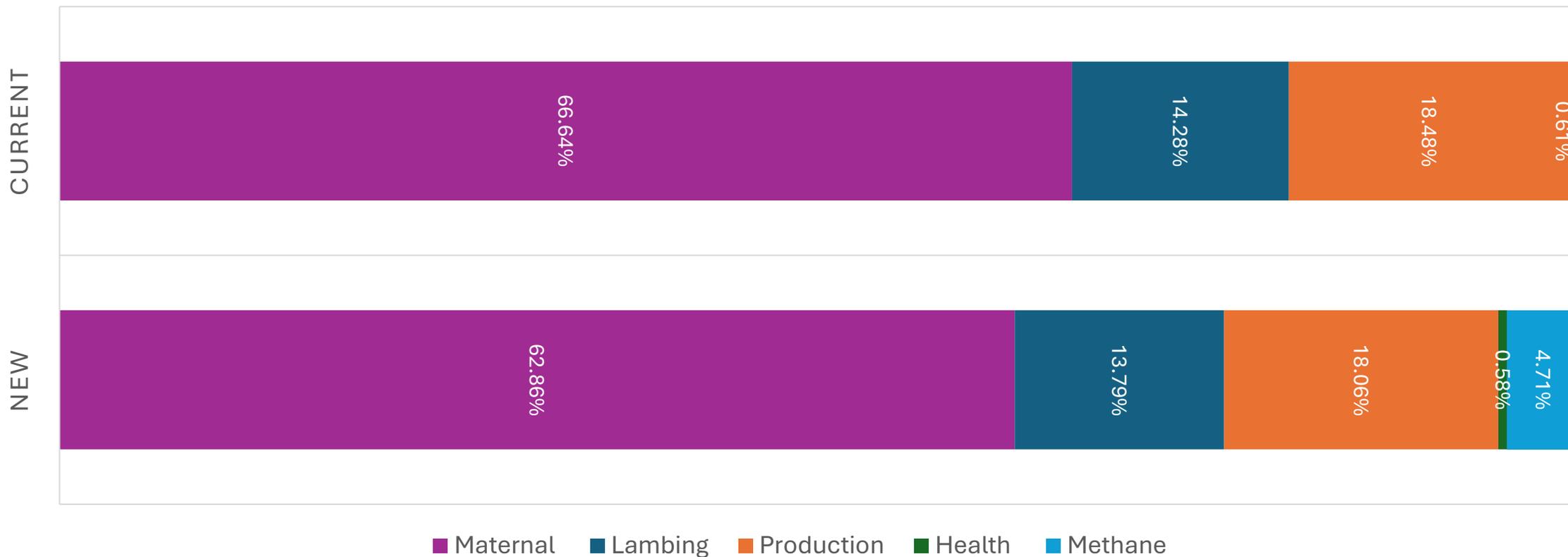
Impact on indexes

€URO-STAR TERMINAL INDEX



Impact on indexes

€URO STAR REPLACEMENT INDEX

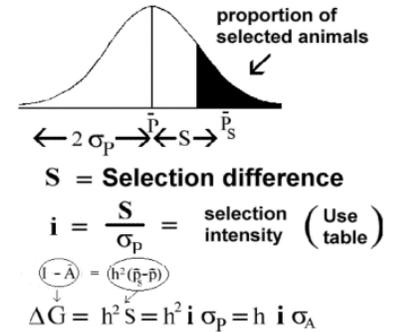


Impact of changes to industry

Response to selection

What will selecting on the indexes do for future performance

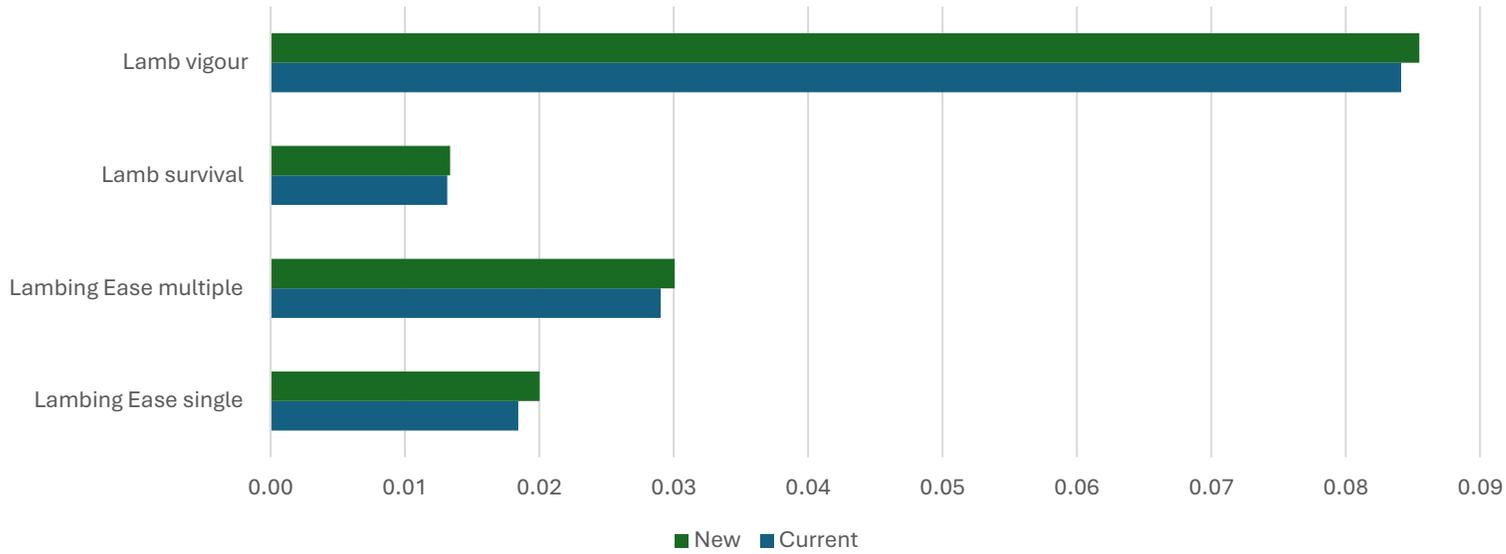
- Compare current index versus new index
- Break it down into the key traits



Where will we be in 10 years time by selecting on this index?



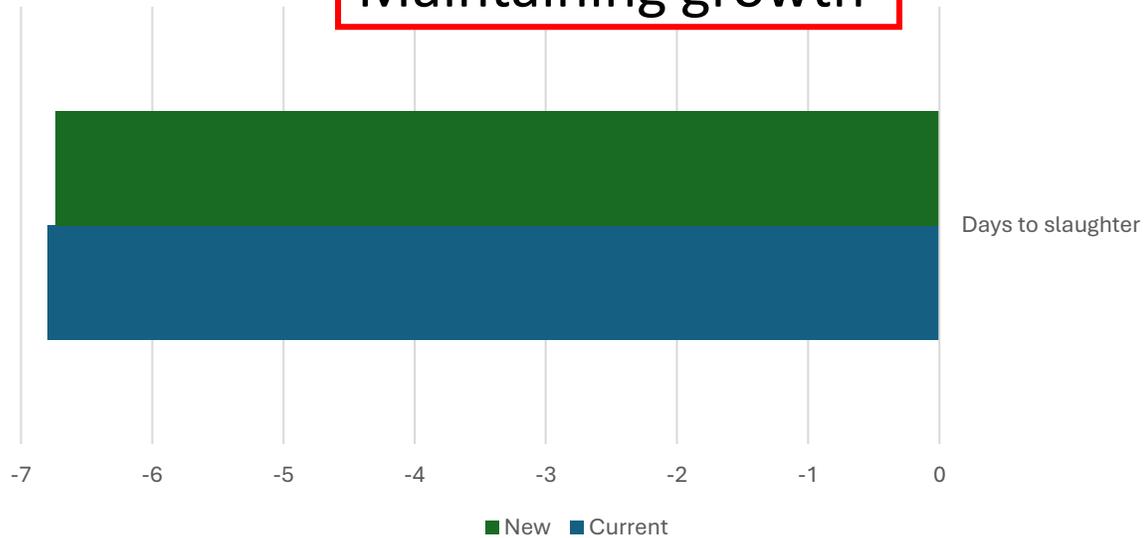
Terminal Index



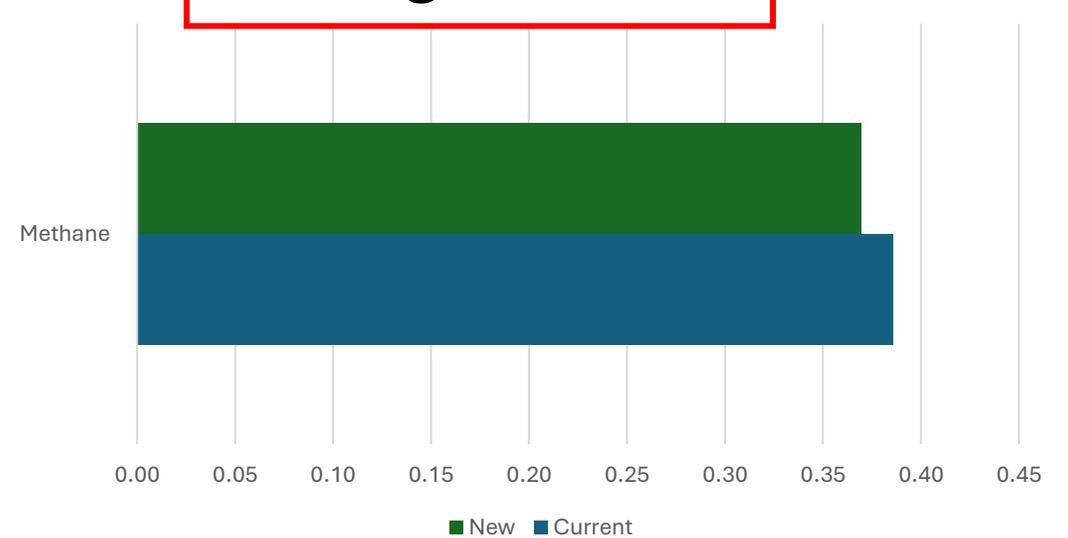
Faster progress in:

- Lamb Survival
- Lambing Ease
- Lamb vigour

Maintaining growth



Slowing methane



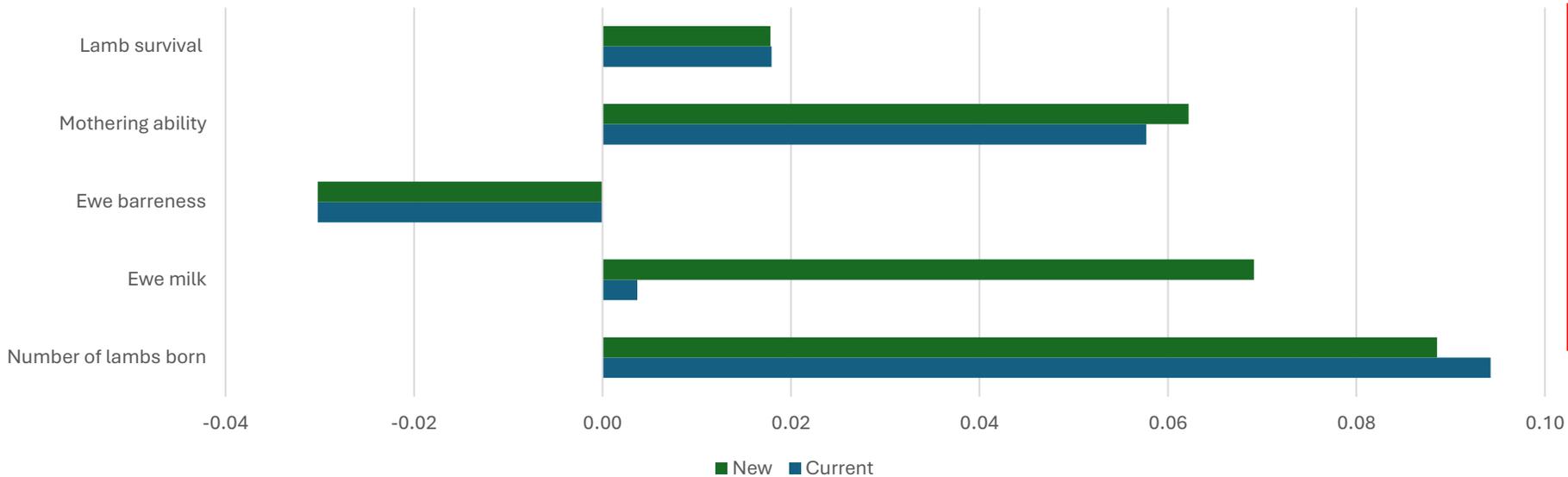
Future ★★★★★ Terminal Ram

1. More lambs (more survival)
2. Less handling of ewes at lambing
3. More lambs that get up and go at lambing
4. Faster finished lambs
5. Producing less methane



Additional profit to
industry
~€15 million

Replacement Index

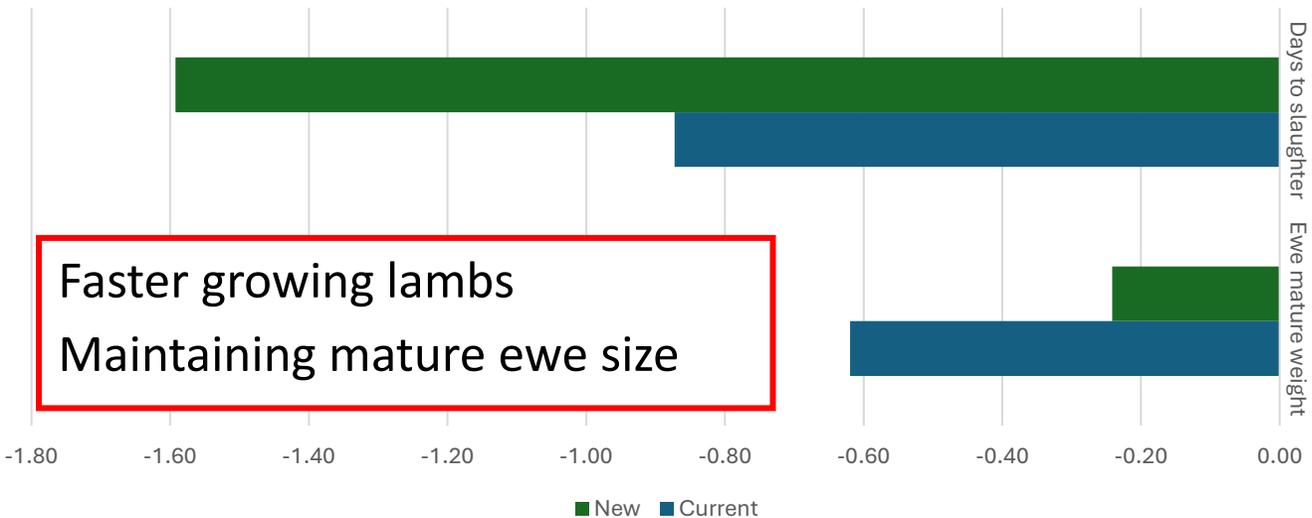


Improving:

- Ewe milk
- Mothering ability

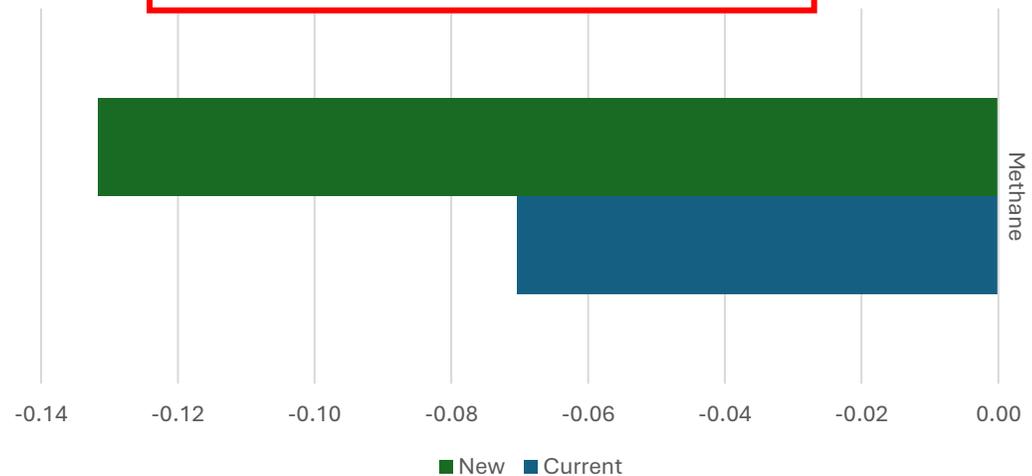
Maintaining:

- NLB



Faster growing lambs
Maintaining mature ewe size

Reducing methane



Future ★★★★★ Replacement Ram

1. More lambs (more survival and NLB)
2. More productive ewes – less barren & better mothers
3. More milk (faster early growth)
4. Faster finished lambs
5. Maintaining ewe mature size
6. Producing less methane



Additional profit to
industry
~€20 million

International perspective

SRDI Farm Advisory Service

Livestock Crops and soils Environment Rural Business Advice & Grants Problem Solver

Low Emissions Livestock Breeding – The What and the Why

8 July 2024



This article is part of the Climate Change & Carbon Research Briefings series. More articles in the series can be found below:

- Understanding Natural Capital Markets
- Collecting On-Farm Biodiversity Data with Bioacoustics
- Faba Beans for Alternative Protein and Reducing Monogastric Carbon Footprint

Related articles

GENETICS HOME RAM SELECTION TOOLS BULL SELECTION TOOLS INFORMING NZ BEEF COOL SHEEP PROGRAMME CASE STUDIES PROGENY TESTS NEWS SIL WEBSITE ABOUT



COOL SHEEP PROGRAMME

Reducing methane emissions in New Zealand's national sheep flock through genetic selection – The Cool Sheep® Programme.

This ground-breaking and world first project aims to give every sheep farmer in New Zealand the opportunity to use genetic selection to reduce greenhouse gas emissions from our national flock.

Selecting for more methane efficient sheep

SEPTEMBER 21 2023



Expression of Interest: Terms of Reference

Emissions Avoidance Partnership (EAP) – Selecting for more methane efficient sheep

Date: 26th August 2023

MLA Program: Emissions Avoidance Program

Project Leader: Julius van der Werf sheepmethane@une.edu.au

ome -> All the news -> Genetic selection: a lever for sheep farming with less environmental impact

CLIMATE CHANGE AND RISKS 3 min share

Genetic selection: a lever for sheep farming with less environmental impact

The European project GrassToGas involving scientists from seven countries, including those from the Genetics, Physiology and Livestock Systems (GenPhysE-INRAE/INP ENSAT/ENVT) laboratory at the INRAE Occitanie-Toulouse centre, has come to end after 5 years of research into greenhouse gas (GHG) emissions from pasture-raised sheep. Here is a summary of the main results.

International perspective

EPA press releases for 2025

Press releases issued by the Environmental Protection Agency for the year 2025



Ireland's Greenhouse Gas Emissions decrease by 2 per cent in 2024

Date released: July 03, 2025

- Ireland's greenhouse gas emissions decreased by 2 per cent (-1.1 Mt CO₂eq) in 2024.
- All sectors, except heating of homes and buildings, saw reductions in 2024:
 - Energy industries emissions decreased by 8.9 per cent (-0.7 Mt CO₂eq)

Agriculture (sheep) emissions decreased by XX% due to sheep breeding

- Transport emissions decreased by 1.2 per cent (-0.1 Mt CO₂eq)
- Industry emissions decreased by 4.6 per cent (-0.3 Mt CO₂eq)
- Heating of homes and buildings increased by 5.6 per cent (+0.4 Mt CO₂eq)

Key messages

- **Two main updates for 2026**
 - Update economic and carbon values
 - Adding new traits: FEC & methane
- **Trait emphasis**
 - Small changes to emphasis on individual traits overall
- **Win : win**
 - Updates will improve performance whilst reducing methane
- Similar research underway in all major sheep producing countries

Acknowledgements



An Roinn Talmhaíochta,
Bia agus Mara
Department of Agriculture,
Food and the Marine



New eval. updates Genomic eval. & Star rating



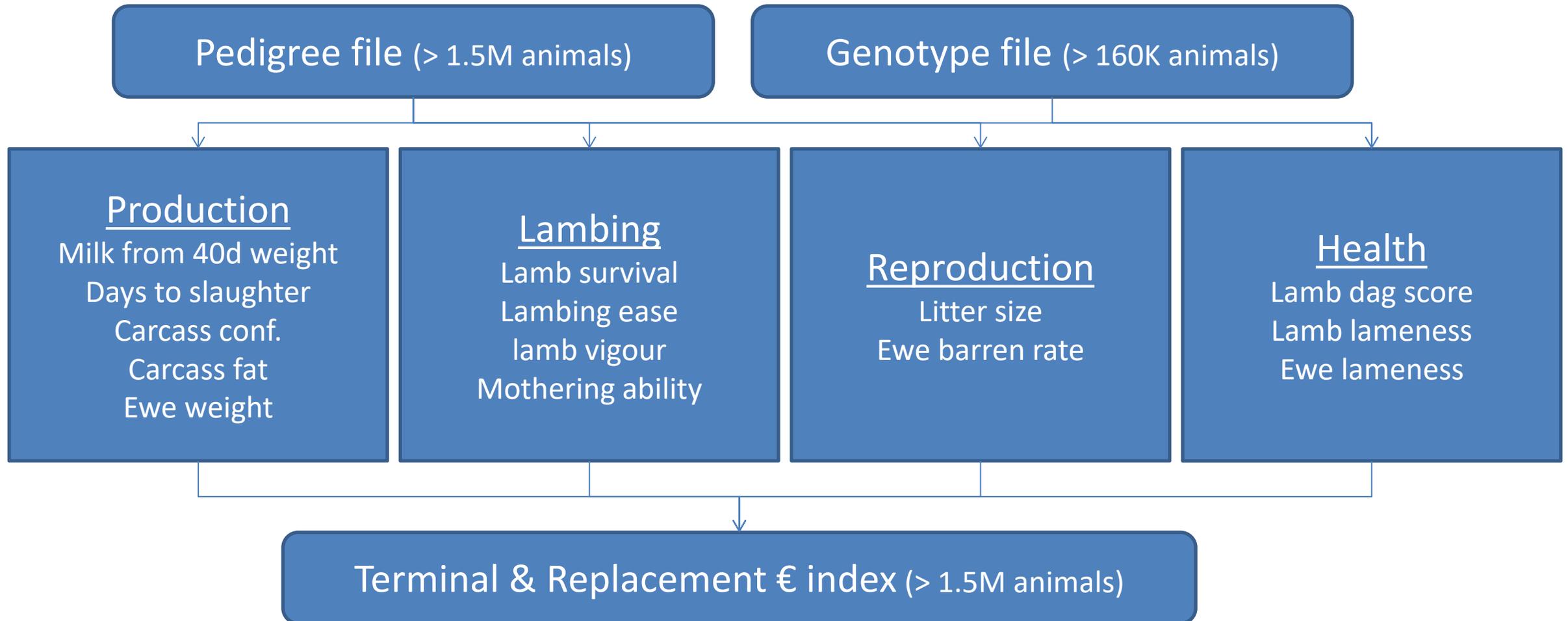
Form ID	Field	Value	Rating
Form 1	Identification	85	***
	Performance	12.5	***
	Health	Good	***
	Other
Form 2	Identification	84	***
	Performance	13.2	***
	Health	Good	***
	Other
Form 3	Identification	86	***
	Performance	11.8	***
	Health	Good	***
	Other



T. Pabiou & Sheep Ireland team
11/12/2025

Current evaluation

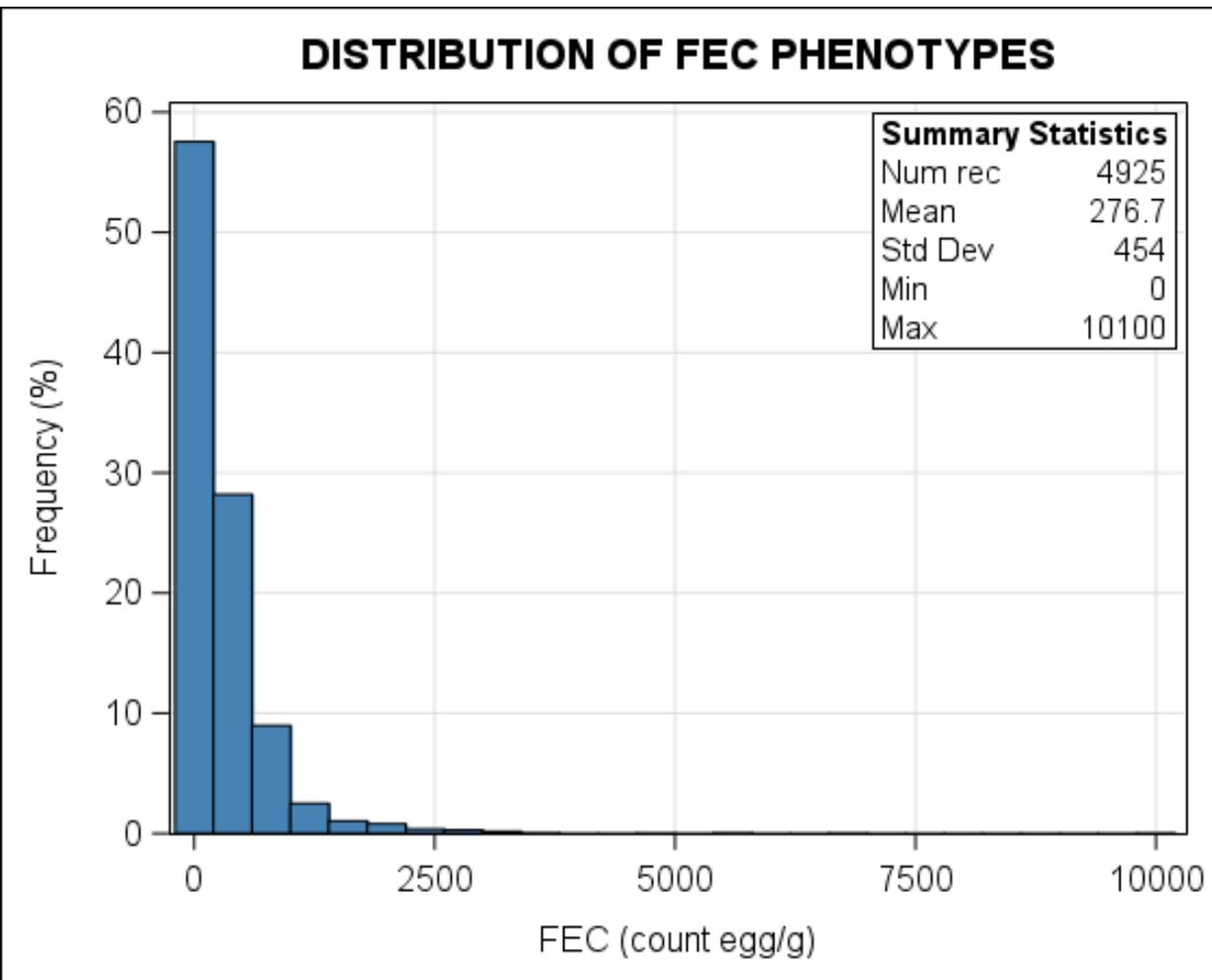
- Across-breed single step genomic (49,393 SNPs)



What's new?

- Updated economic values (Teagasc bio-eco. model)
- New Faecal egg count trait (FEC) in Health module
- New Methane module
 - Methane PTA estimated from PAC phenotypes (= enteric emission)
- Updated Terminal & Replacement indexes
 - All 3 new items (updated E.V., new FEC, new Methane)
 - Carbon costs estimated from LCA farm model (= non-enteric emission)
 - Enteric + Non-enteric emission = total farm emission

Faecal egg count phenotypes



- Phenotype evaluated

- $FEC_e = \log [\text{Count P. STRONGYLE}]$
 - ≥ Transformation similar to SCC -> SCS in dairy

+4K FEC records
on 2.2K lambs

FEC : 70% commerial records

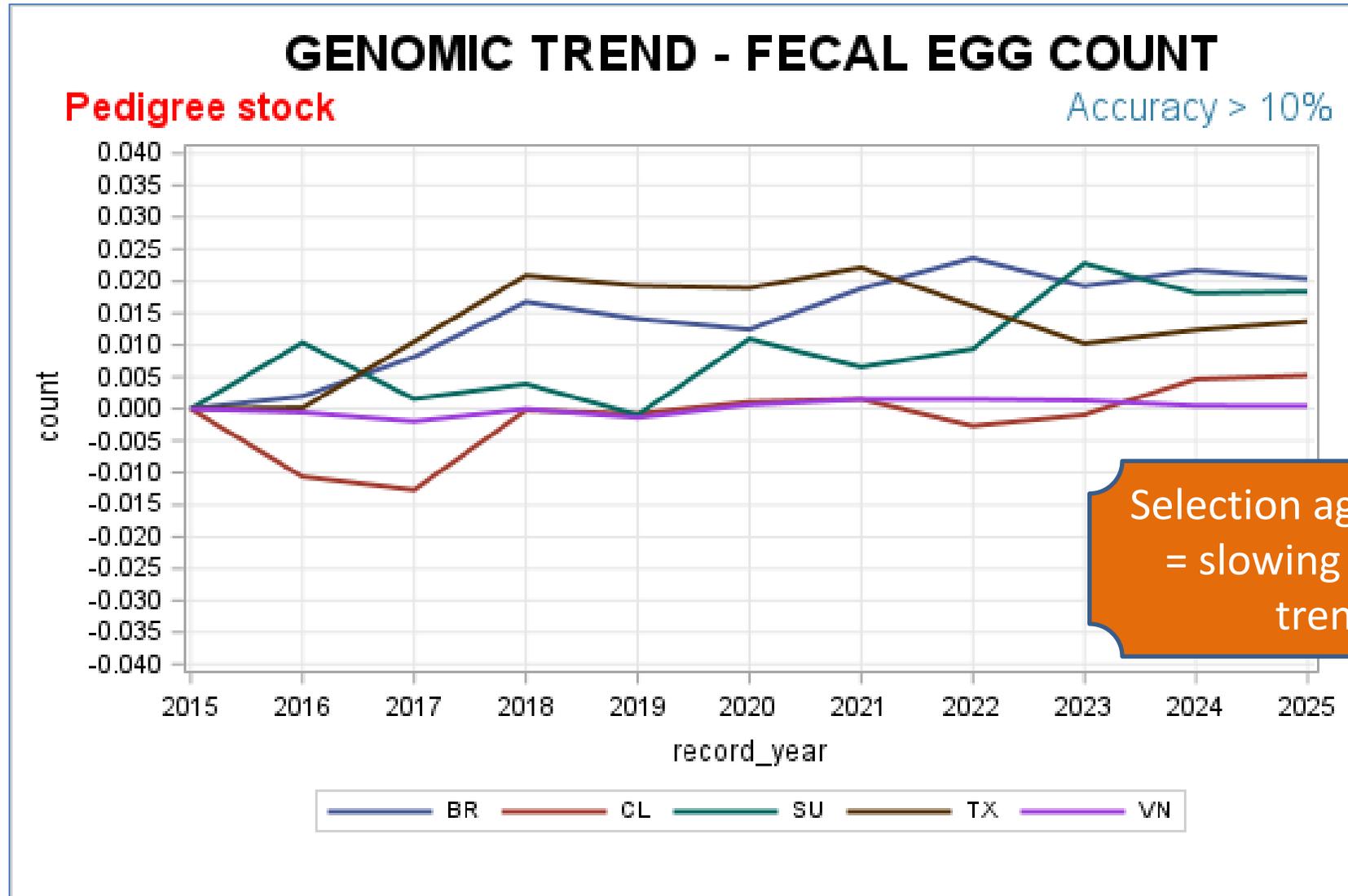
		DAM BREED										
SIRE BREED		BR	BX	CL	EC	HD	LY	RL	SU	TX	UN	VN
	BR	501	0	90	11	0	15	0	262	297	183	4
	BX	4	0	3	0	0	0	0	1	1	0	0
	CL	343	0	94	6	0	12	0	194	217	205	35
	EC	2	0	0	0	0	6	0	0	2	0	0
	HD	4	0	0	0	0	0	0	7	2	0	0
	LY	31	0	0	2	0	8	0	28	91	2	0
	RL	4	0	0	0	0	0	0	13	0	0	0
	SU	461	0	107	10	0	29	0	378	128	76	0
	TX	310	0	72	34	0	64	0	97	390	14	22
	UN	10	0	3	2	0	0	0	5	9	1	0
	VN	6	0	0	0	0	0	0	5	2	0	2

Adding FEC to the Health module

	DAG	LAME. LAMB	LAME. EWE	FEC
DAG	12.3%			
LAME. LAMB	0	10.7%		
Heritability on diagonal; genetic correlation below diagonal				
LAME. EWE	0	0.38	5.6%	
FEC	0	0	0	

6.6% heritability :
good opportunity for
selection

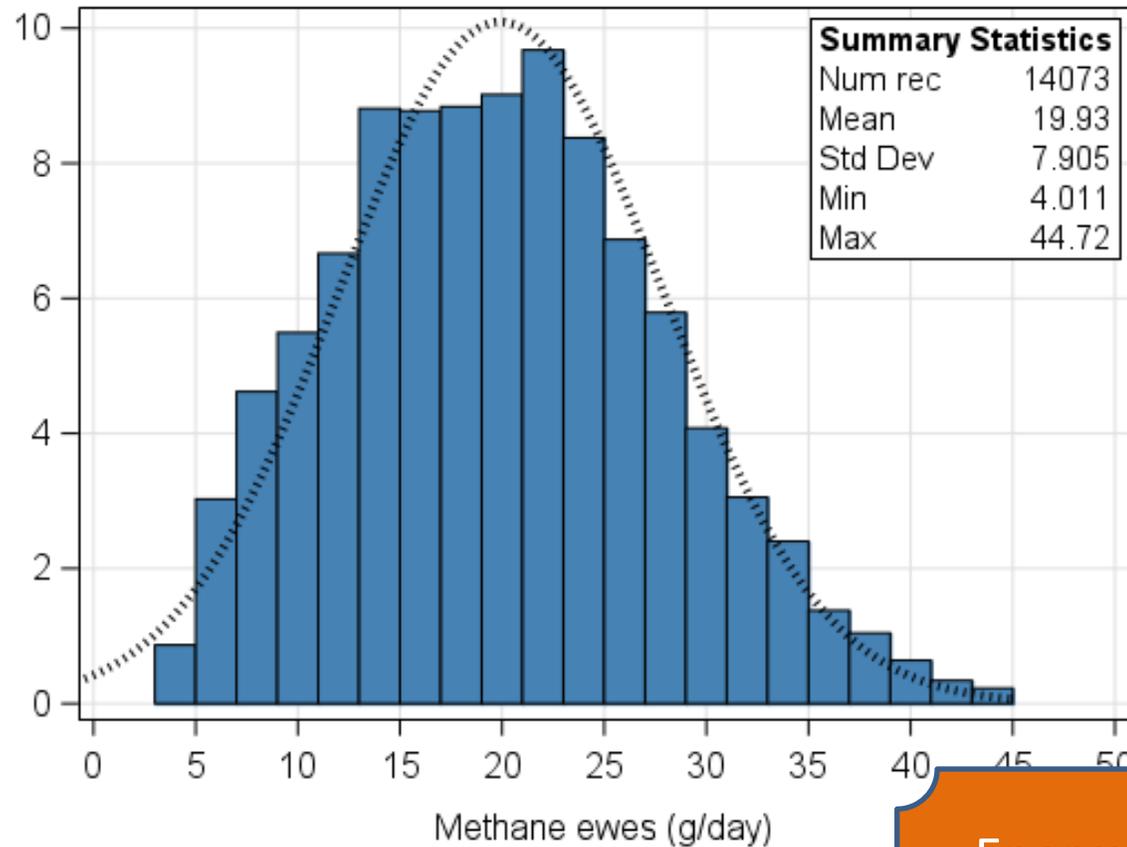
FECAL EGG COUNT GENETIC TREND*



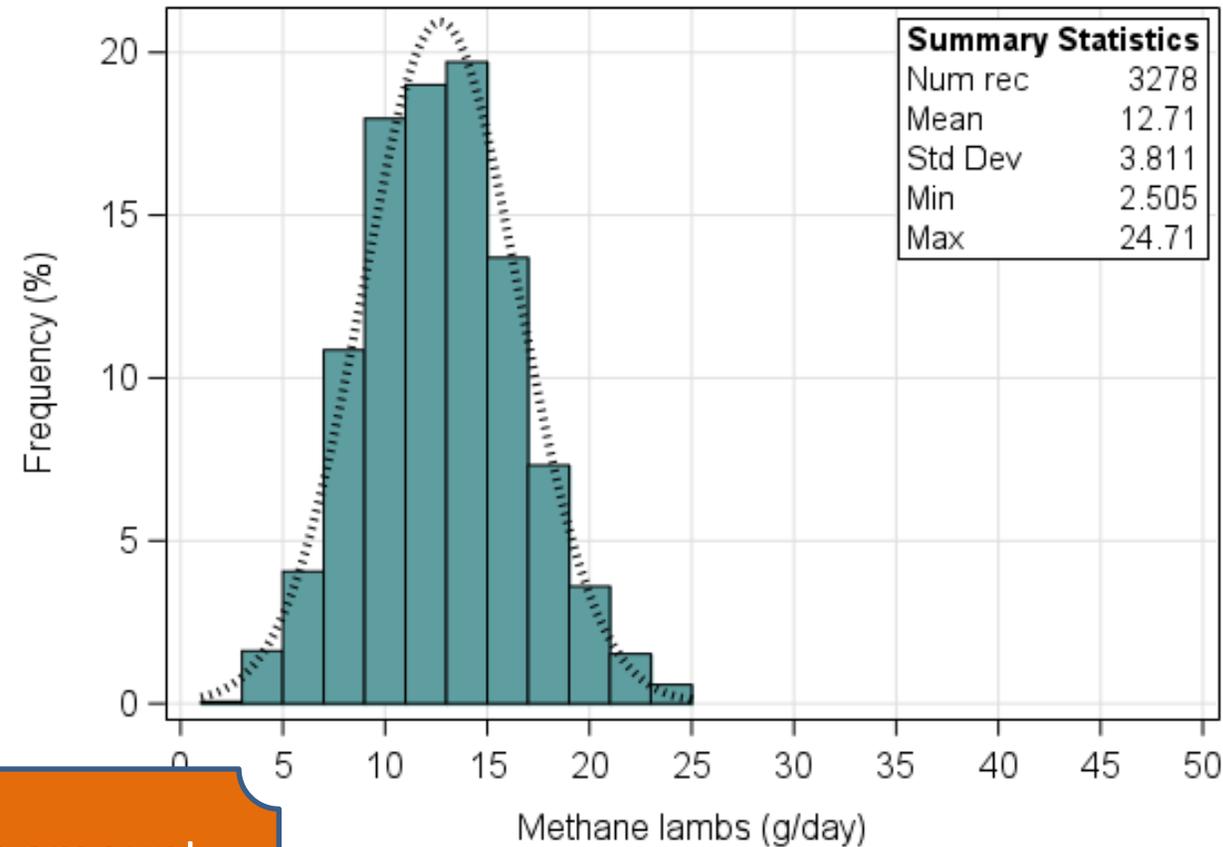
*Based on pedigree rams +10% acc. on trait

Methane phenotypes

**DISTRIBUTION OF METHANE PHENOTYPES
RECORDED ON EWES**



**DISTRIBUTION OF METHANE PHENOTYPES
RECORDED ON LAMBS**



Enormous amount
of methane records!

Lamb methane: 40% commercial data*

		DAM BREED													
SIRE BREED		BL	BM	BR	BX	CL	CV	EC	LY	NC	RL	SU	TX	VN	
	BL	5	0	0	0	0	0	0	0	0	0	0	0	0	0
	BM	0	115	0	0	0	0	0	0	0	0	0	0	0	0
	BR	0	0	257	2	0	0	6	9	0	0	17	20	0	0
	BX	0	0	0	22	0	0	0	0	0	0	0	0	0	0
	CL	0	0	44	0	242	0	0	0	0	0	1	7	0	0
	CV	0	0	0	0	0	193	0	0	0	0	0	0	0	0
	EC	0	0	5	0	0	0	3	1	0	0	0	4	1	0
	LY	0	0	13	0	1	0	0	142	0	0	2	1	0	0
	NC	0	0	0	0	0	9	0	0	0	0	0	0	0	0
	RL	0	0	0	0	0	0	0	0	0	10	0	0	0	0
	SU	0	0	16	0	0	0	0	0	0	0	394	1	0	0
	TX	0	0	429	0	2	0	3	3	0	0	13	527	0	0
	VN	0	0	0	0	0	0	0	0	0	0	0	0	0	36

Targeted flocks to limit the cost of recording

*30% commercial data for ewe methane records across 17 breeds of ewes

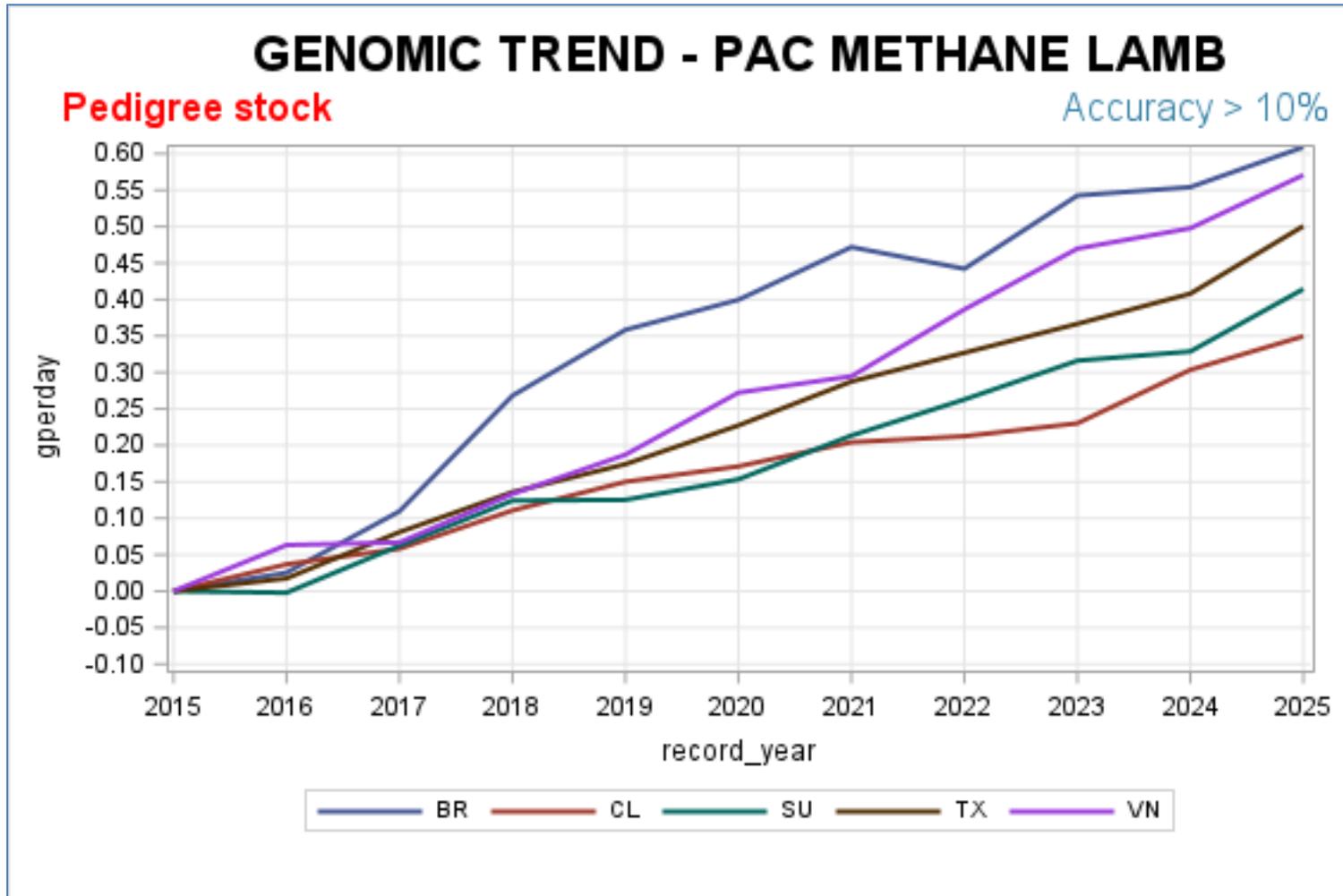
The methane module

	WD40	WWT	WSCA	WEWE	CH4 Lamb	CH4 Ewe
Weight D40	27.1%					
Weight WT	0.92	26.8%				
Weight SCA	0.82	0.91	34.2%			
Weight EWE	0.40	0.44	0.61	21.4%		
CH4 Lamb	0	0.44 (0.15)	0.39 (0.15)	0	29.3%	
CH4 Ewe	0	0	0	0.36	0.20	18.7%

Heritability on diagonal; genetic correlation below diagonal

Live weights are good predictors for methane emission

PAC METHANE GENETIC TREND*



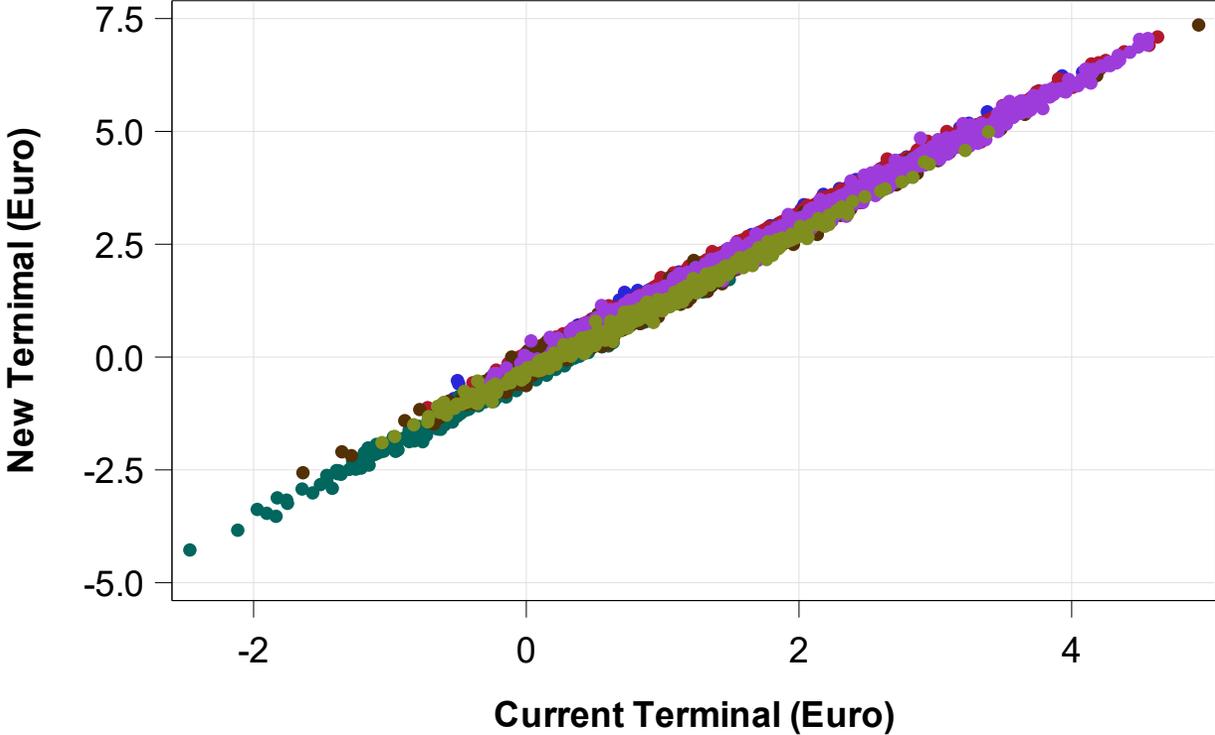
*Based on pedigree rams +10% acc. on trait

Selection against methane = slowing genetic trend

Correlation between current & new Terminal

Joint Distribution of Terminal Indexes

Pedigree rams born 2015+

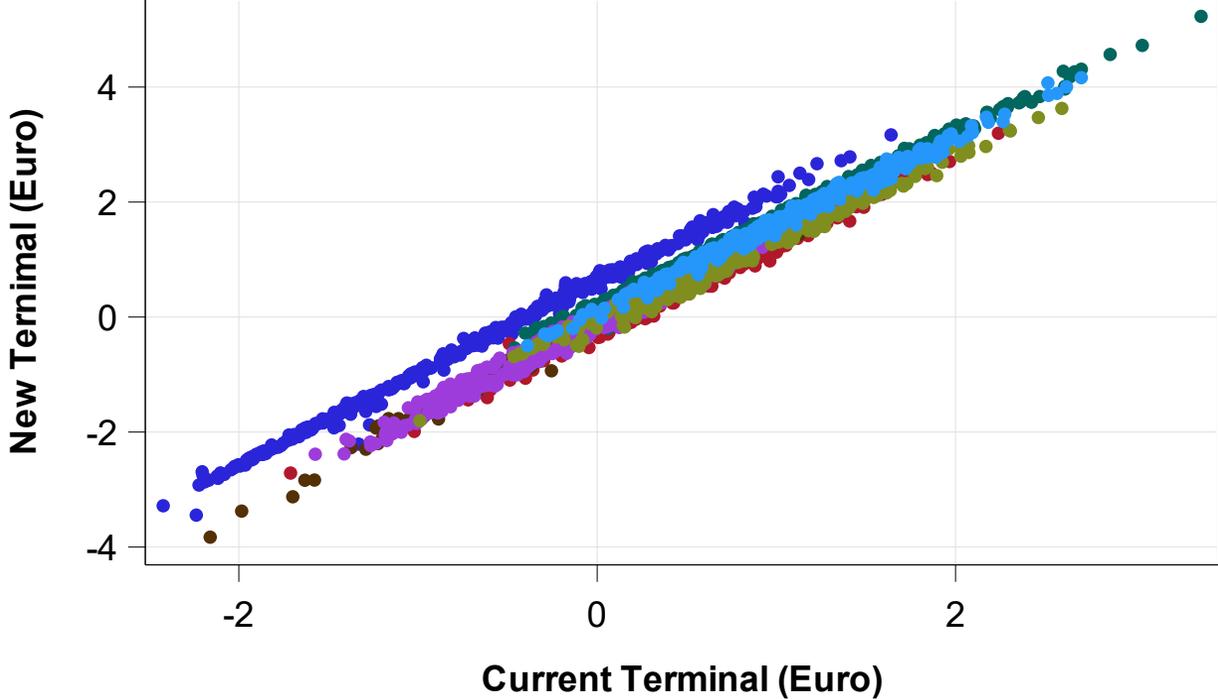


- Breed*: correlation**
- BR: 0.997
 - CL: 0.998
 - LY: 0.996
 - SU: 0.995
 - TX: 0.998
 - VN: 0.997

*Belclare, Charollais, Lley, Suffolk, Texel, Vendeen

Joint Distribution of Terminal Indexes

Pedigree rams born 2015+



- Breed*: correlation**
- BL: 0.998
 - BT: 0.988
 - BX: 0.997
 - EC: 0.994
 - GL: 0.991
 - HD: 0.988
 - RL: 0.996
- Blue Texel, EasyCare, Galway, Hampshire Down, Lley, Rouge de

Very strong correlation within breeds!

TERMINAL STAR MOVEMENTS

Active rams

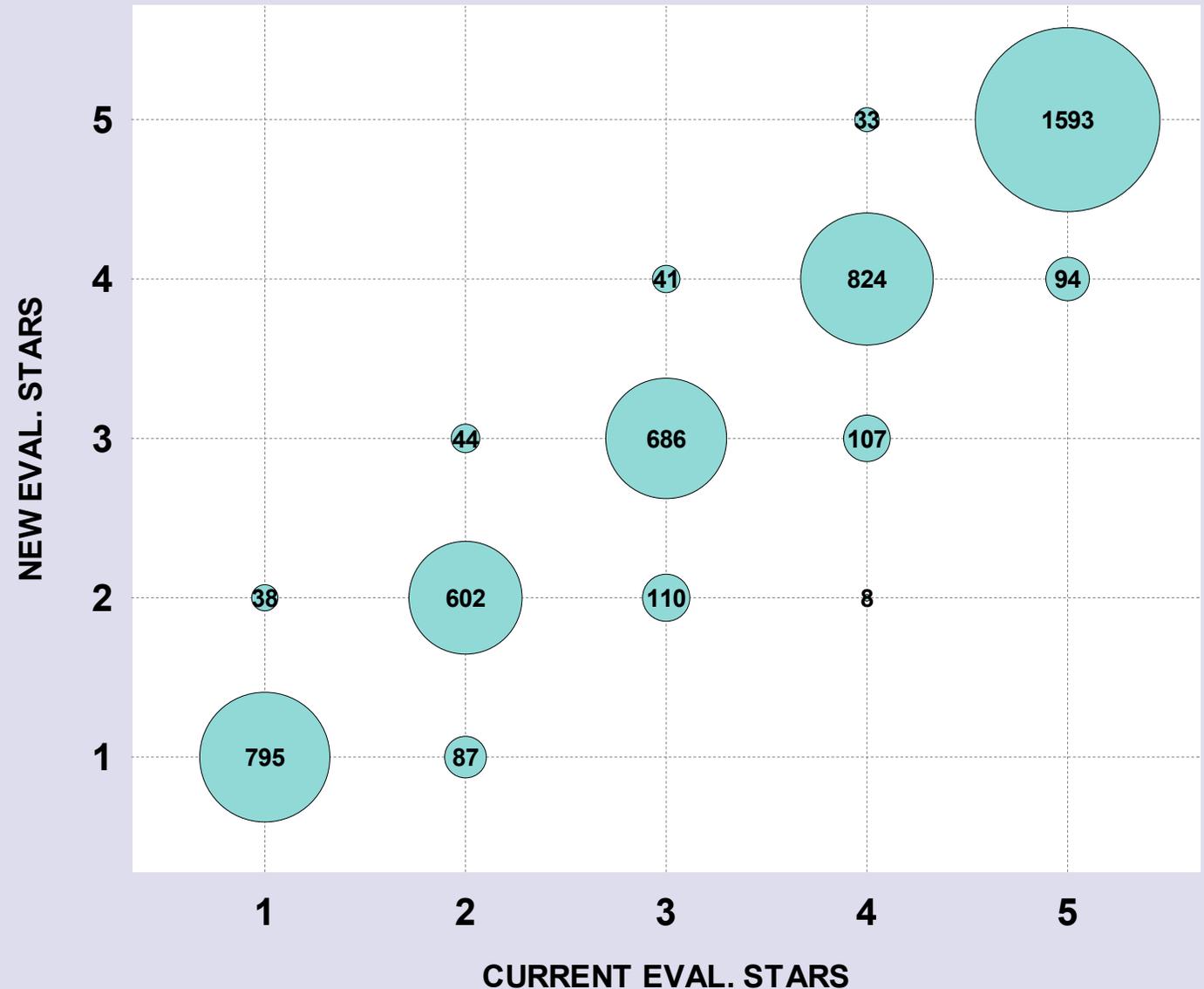
~90% of active rams keep or increase their terminal star rating

TERMINAL STARS MOVEMENTS - Active rams from 13 breeds*

Star gain: 156

Star equal : 4500

Star loss: 406



*Belclare, Blueface Leicester, Blue Texel, Charollais, EasyCare, Galway, Hampshire Down, Lleyn, Rouge de l'Ouest, Suffolk, Texel, Vendéen

TERMINAL STAR MOVEMENTS Ram lambs

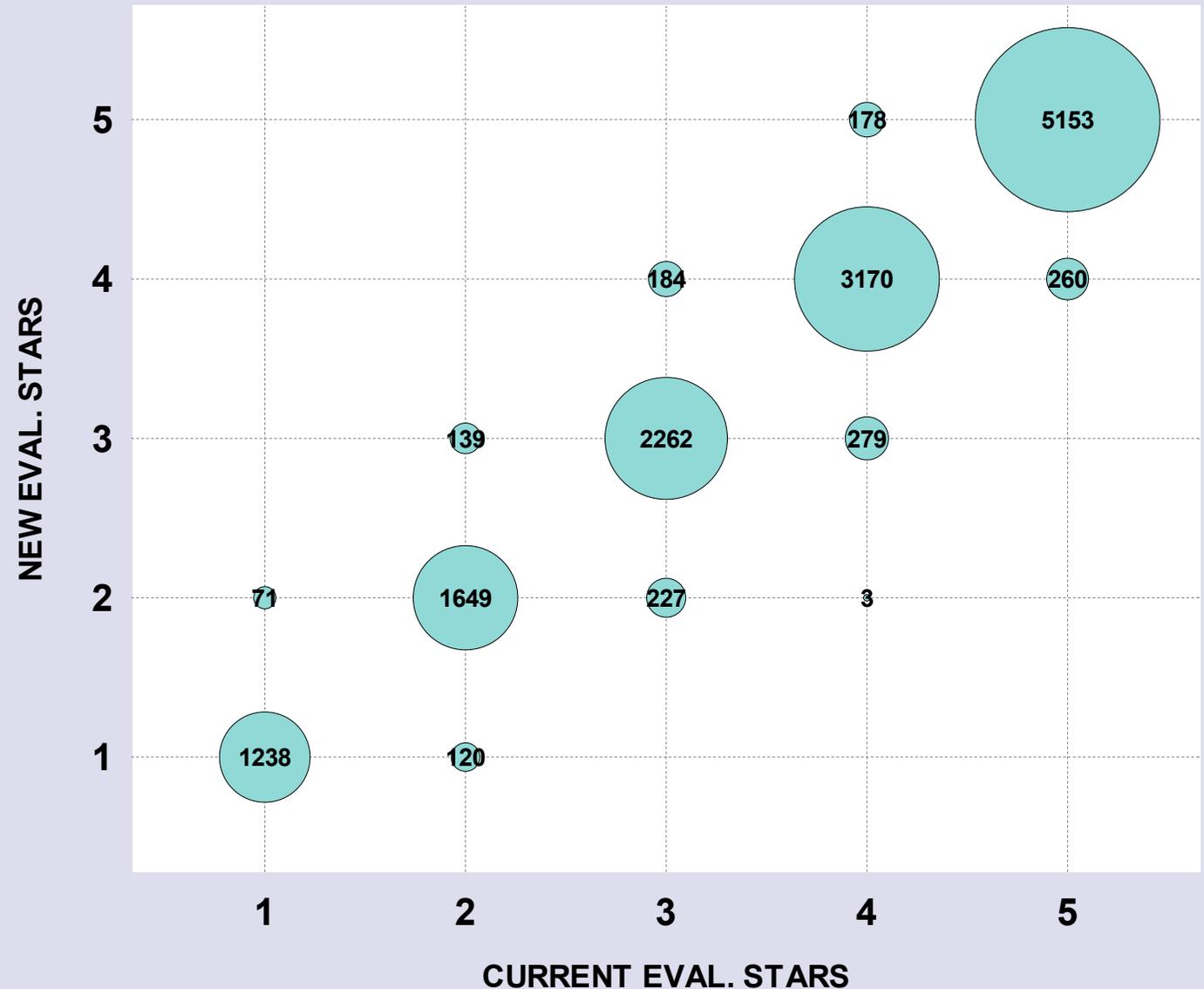
10% ram lambs
move ± 1 Terminal
star

TERMINAL STARS MOVEMENTS - Ram lambs from 13 breeds*

Star gain: 572

Star equal : 13472

Star loss: 889

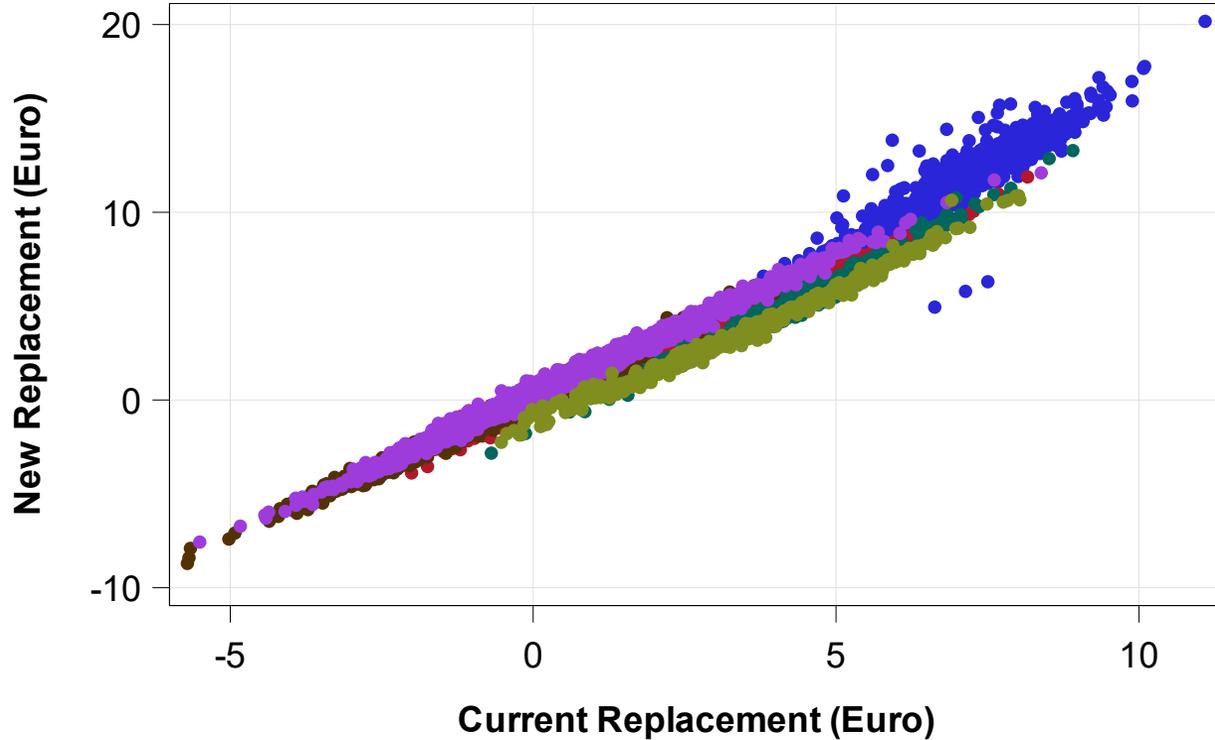


*Belclare, Blueface Leicester, Blue Texel, Charollais, EasyCare, Galway, Hampshire Down, Lleyn, Rouge de l'Ouest, Suffolk, Texel, Vendéen

Correlation between current & new Replacement

Joint Distribution of Replacement Indexes

Pedigree rams born 2015+

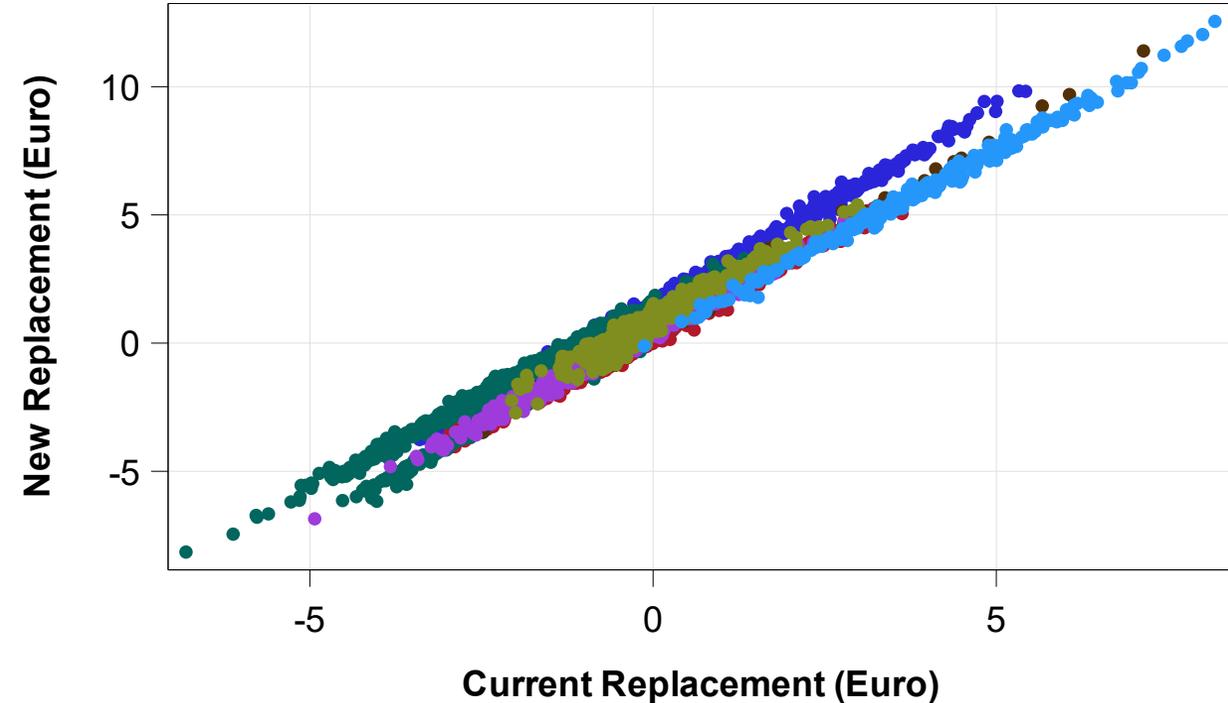


- Breed*: correlation**
- BR: 0.949
 - CL: 0.994
 - LY: 0.99
 - SU: 0.993
 - TX: 0.996
 - VN: 0.993

*Belclare, Charollais, Lleyn, Suffolk, Texel, Vendeen

Joint Distribution of Replacement Indexes

Pedigree rams born 2015+



- Breed*: correlation**
- BL: 0.998
 - BT: 0.99
 - BX: 0.962
 - EC: 0.997
 - GL: 0.993
 - HD: 0.973
 - RL: 0.997

Blue Texel, EasyCare, Galway, Hampshire Down, Lleyn, Rouge de

Very little re-ranking expected on Replacement!

REPLACEMENT STAR MOVEMENTS

Active rams

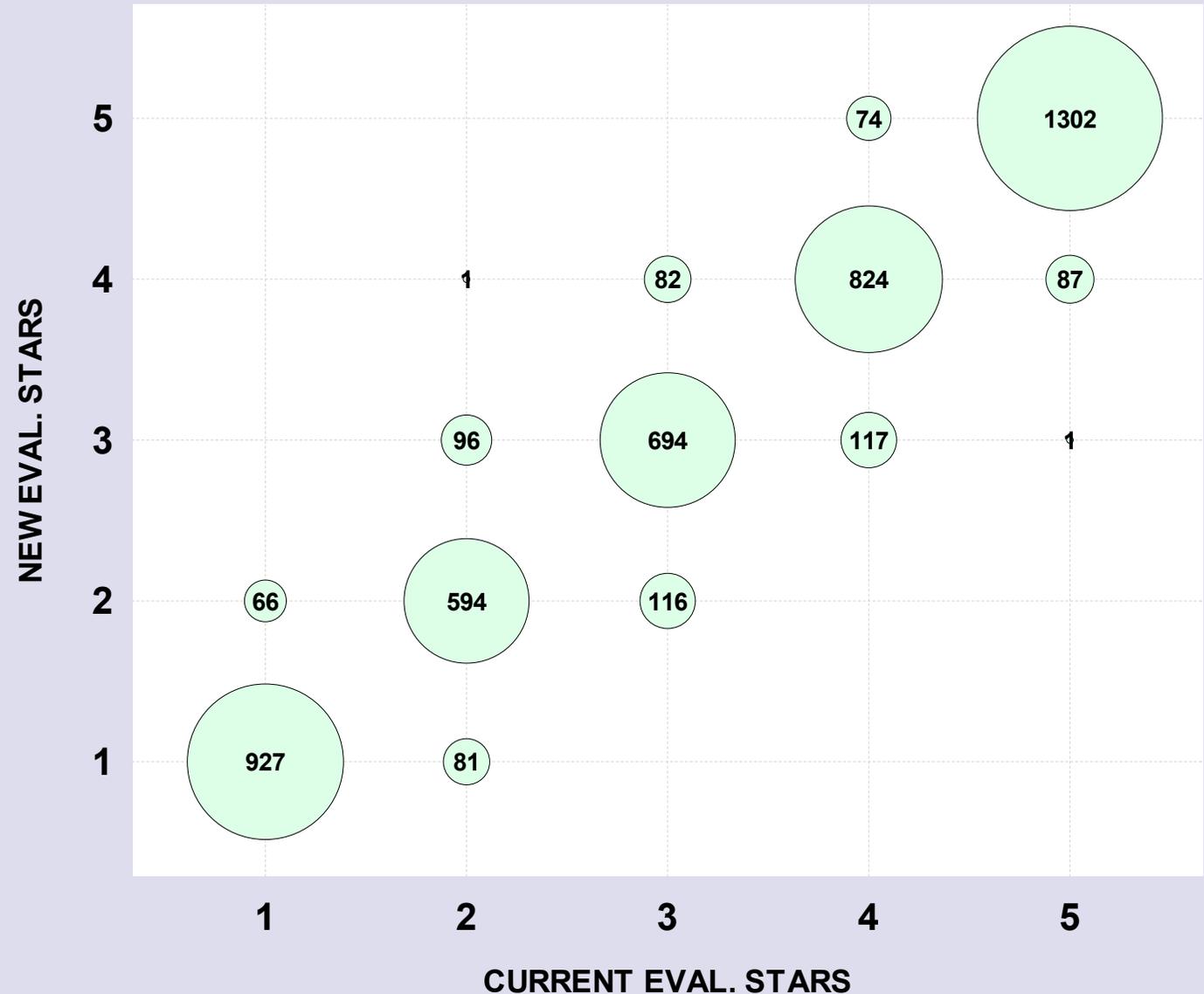
86% of active rams
keep or increase
their Replacement
star rating

REPLACEMENT STARS MOVEMENTS - Active rams from 13 breeds*

Star gain: 319

Star equal: 4341

Star loss: 402



*Belclare, Blueface Leicester, Blue Texel, Charollais, EasyCare, Galway, Hampshire Down, Lleyn, Rouge de l'Ouest, Suffolk, Texel, Vendéen

REPLACEMENT STAR MOVEMENTS Ram lambs

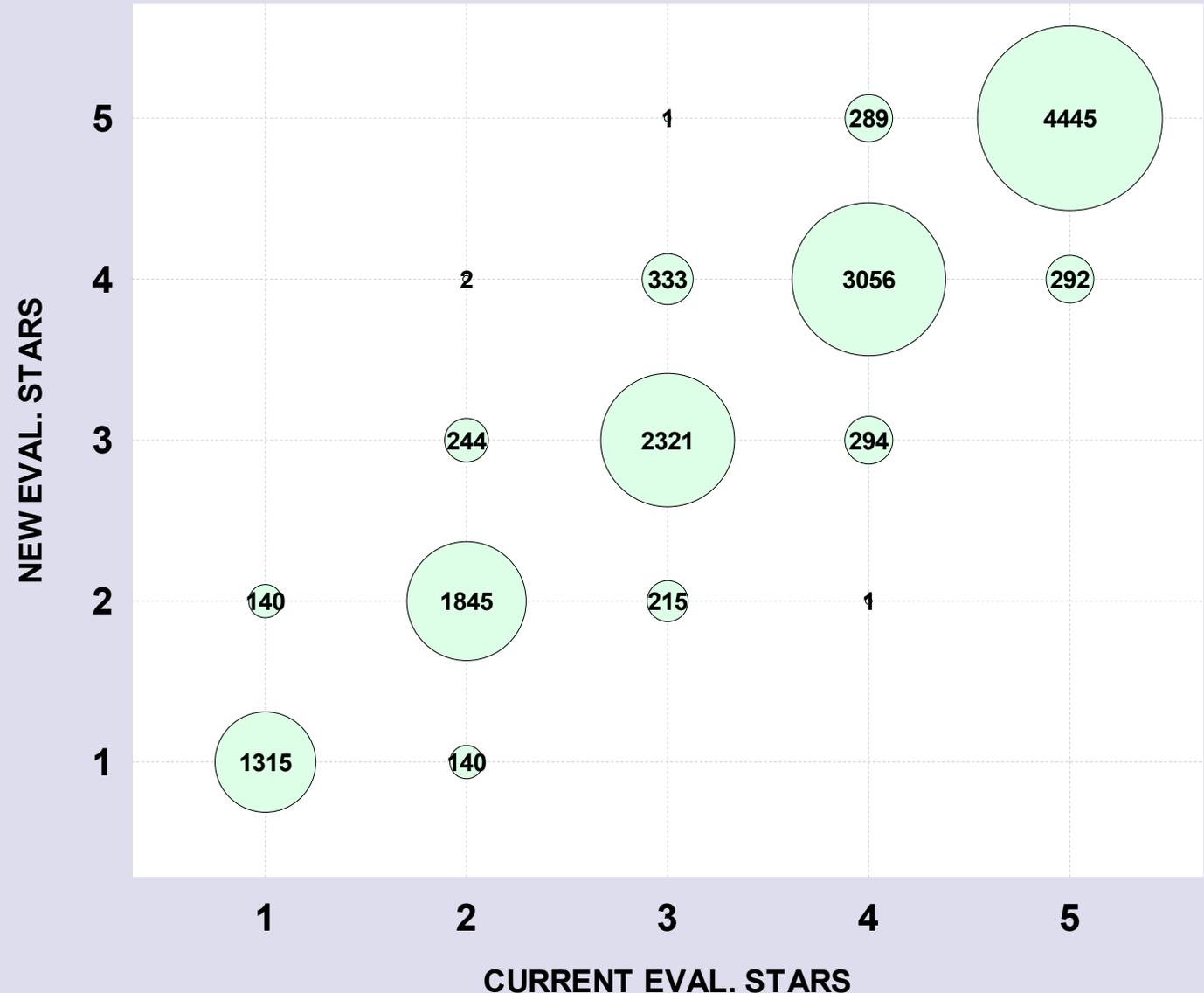
±1 Terminal star
movement on 13%
ram lambs

REPLACEMENT STARS MOVEMENTS - Ram lambs from 13 breeds*

Star gain: 1009

Star equal: 12982

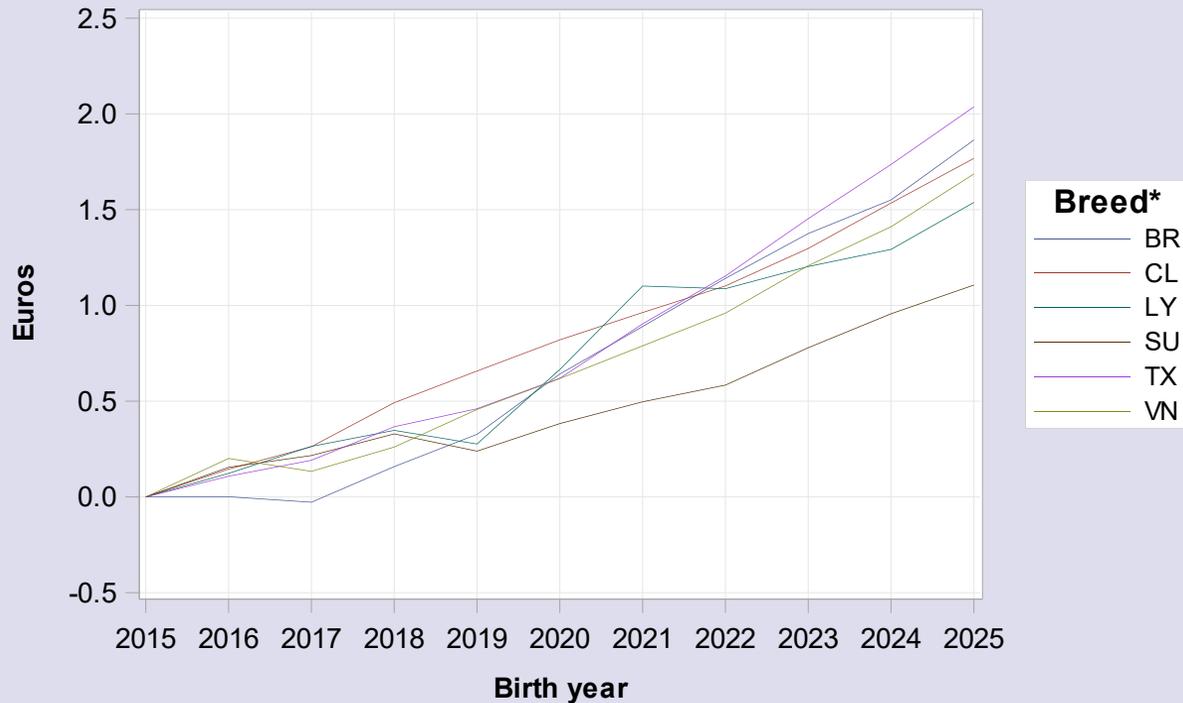
Star loss: 942



*Belclare, Blueface Leicester, Blue Texel, Charollais, EasyCare, Galway, Hampshire Down, Lleyn, Rouge de l'Ouest, Suffolk, Texel, Vendéen

Terminal genetic trend

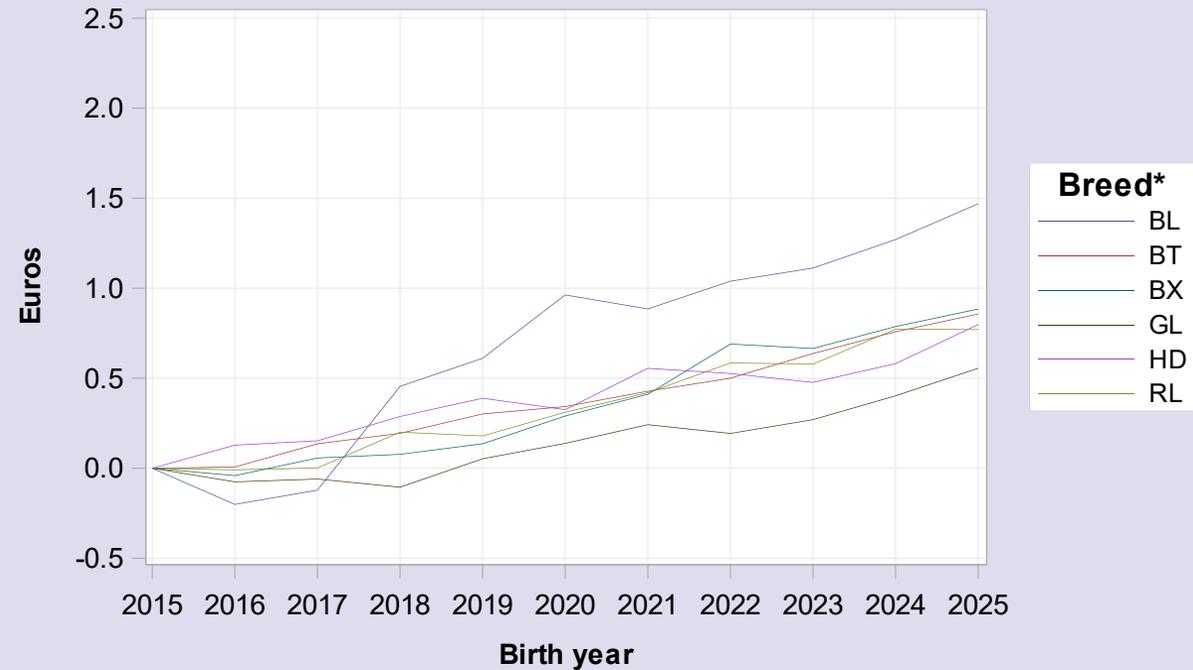
Genomic trend for Terminal index
Pedigree with accuracy > 10%



*Belclare, Charollais, Lleyn, Suffolk, Texel, Vendeen

Prev: +0.10€/year
New: +0.15€/year

Genomic trend for Terminal index
Pedigree with accuracy > 10%

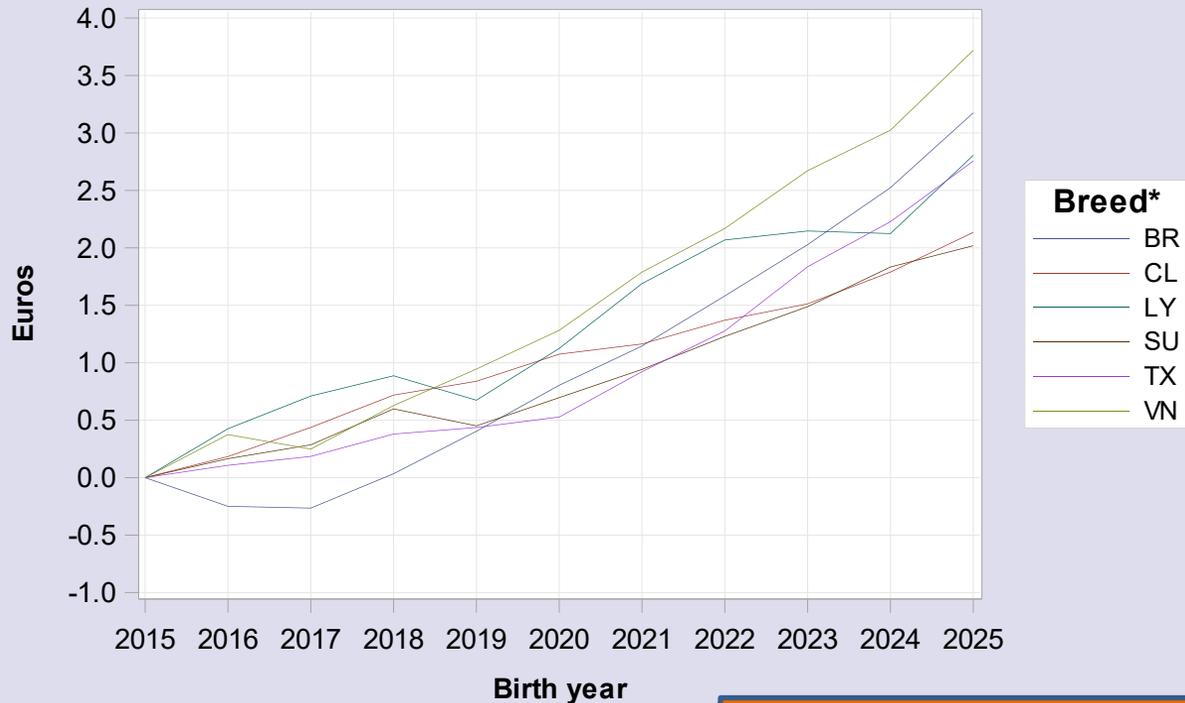


*Blueface Leicester, Blue Texel, EasyCare, Galway, Hampshire Down, Lleyn, Rouge de l'Ouest

Every breed is making faster gains!

Replacement genetic trend

Genomic trend for Replacement index
Pedigree with accuracy > 10%



*Belclare, Charollais, Lleyn, Suffolk, Texel, Vendéen

Prev: +0.18€/year
New: +0.23€/year

Genomic trend for Replacement index
Pedigree with accuracy > 10%



*Blueface Leicester, Blue Texel, EasyCare, Galway, Hampshire Down, Lleyn, Rouge de l'Ouest

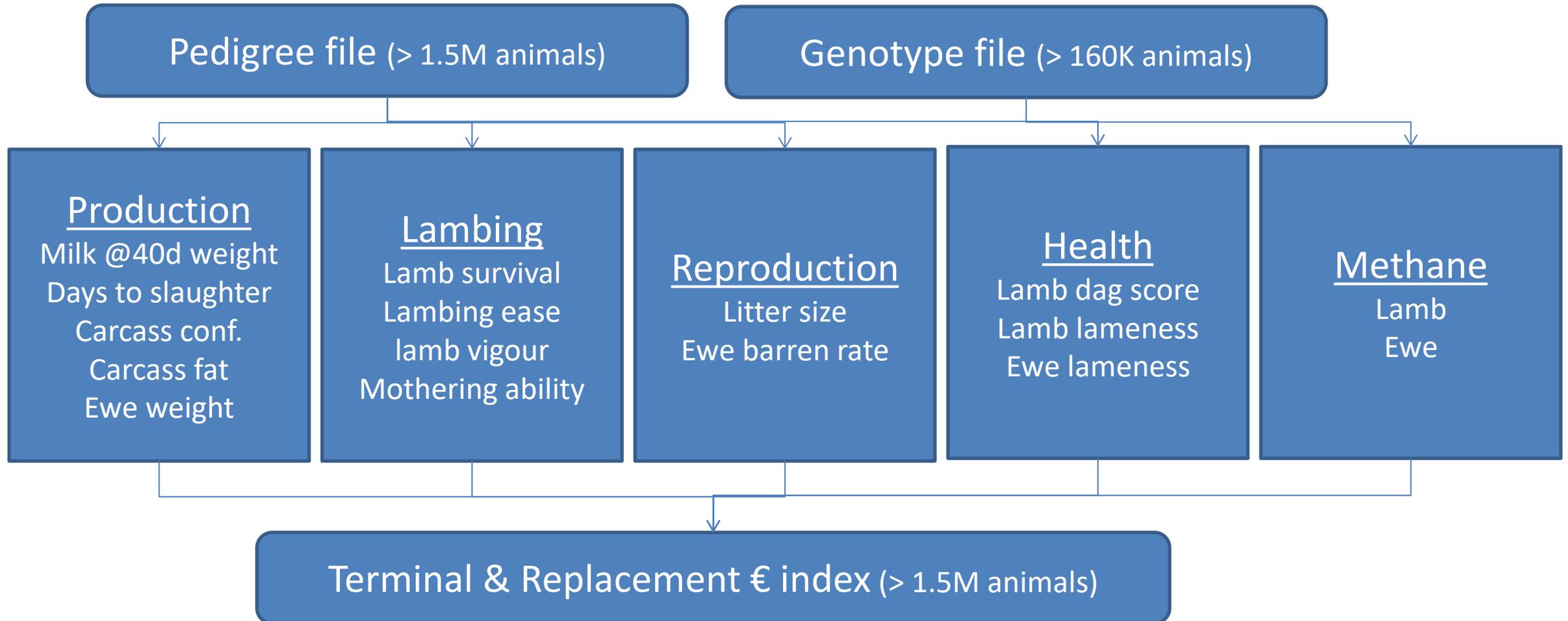
Still faster gains!

Conclusion

- New E.V.
 - Acceleration of genetic progress
- Carbon
 - No bias in star movements
- Breeding program
 - More efficiency

New evaluation

- Across-breed single step genomic (49,393 SNPs)



Thank you for listening

Panel Discussion

