COLLOQUE SERAM 2
Semaine Européenne des Races locales des Massifs
Oloron-Sainte-Marie
« PASTORALISME & RACES LOCALES »
16-17-18 septembre 2018
CORAM races de massifs

Characteristics of adaptation to outdoor sheep farming in Scotland, Ireland and Norway

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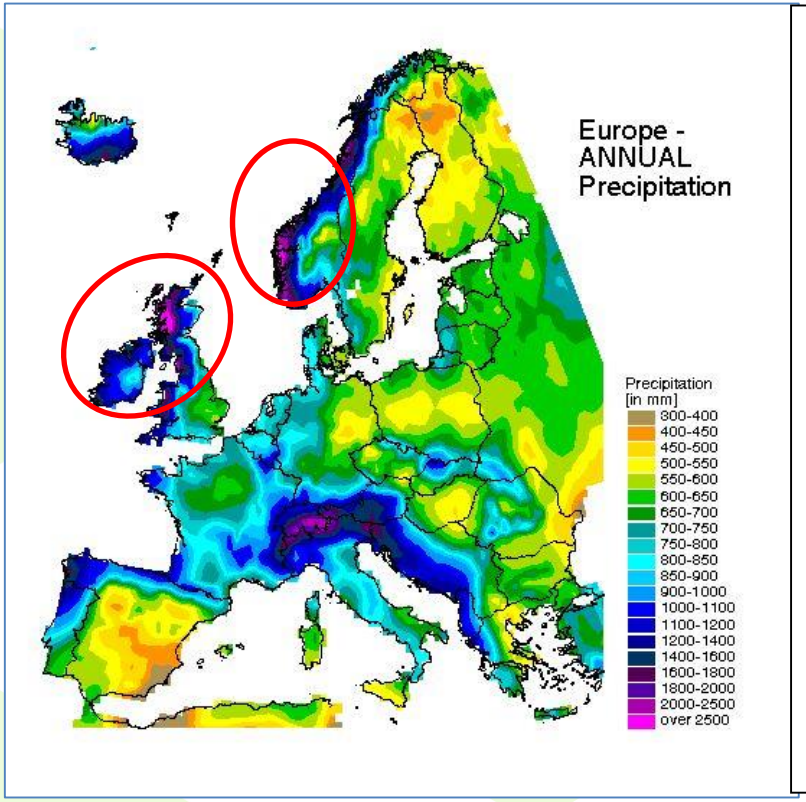
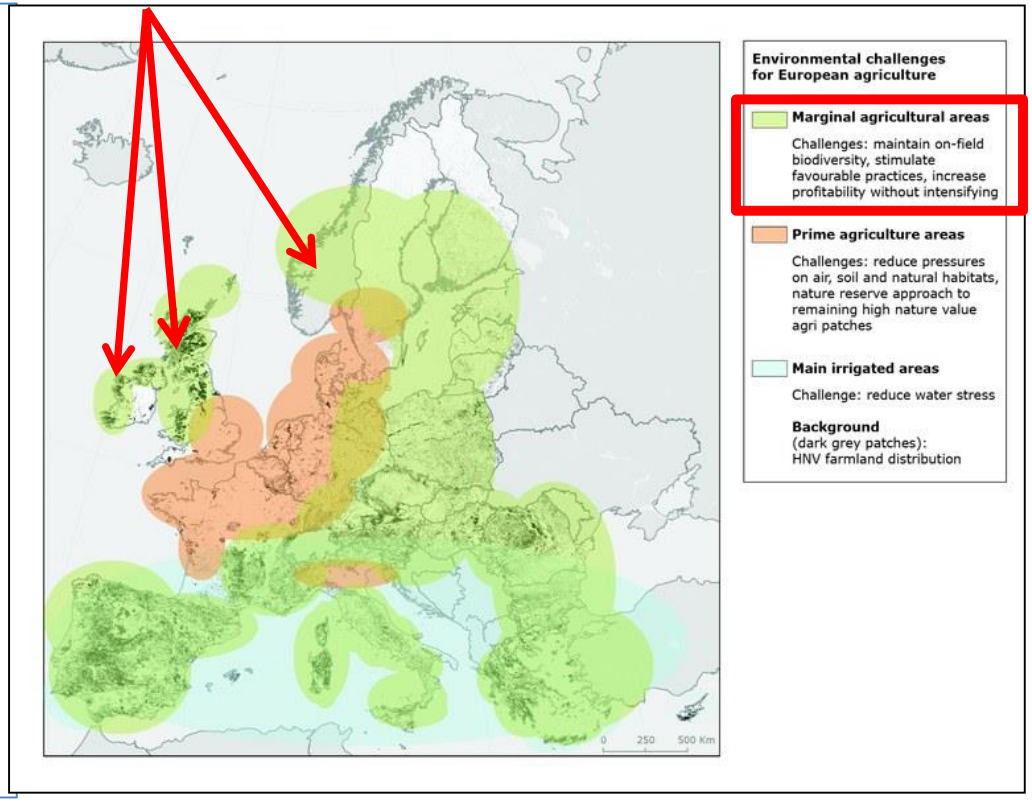
Outline

1. Challenges faced by Northern Europe systems
2. Systems in these countries
3. Initiatives and projects to adapt to challenges and systems
   a) Breeding strategies
   b) Research initiatives (Scotland)
4. Labour & economic gains – EU project
5. Driving uptake
6. Conclusions

1. Northern Europe challenges





- Climate – temperature, rainfall, etc.
- Soil/vegetation
- Outdoors systems – predators, remoteness
- Lack of choices for production

Less Favoured Areas/marginal areas

Source: Europa.eu

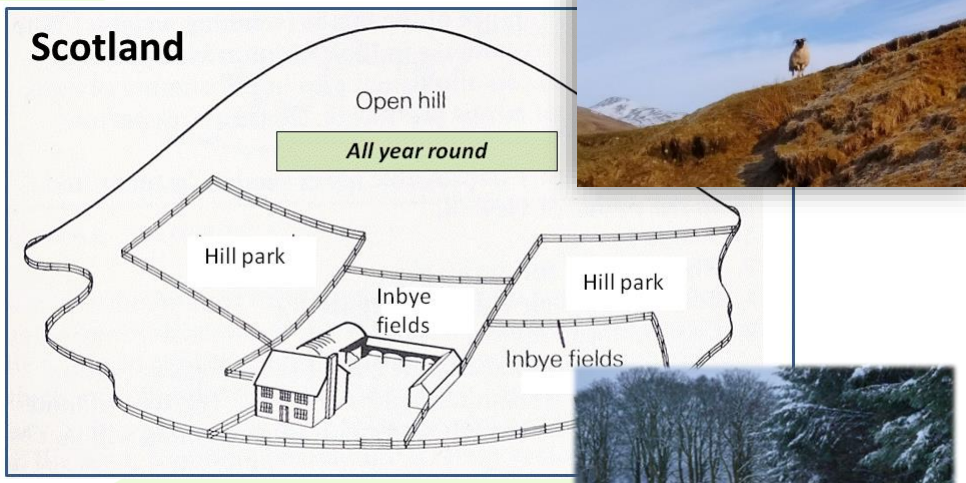
2. Systems in these countries

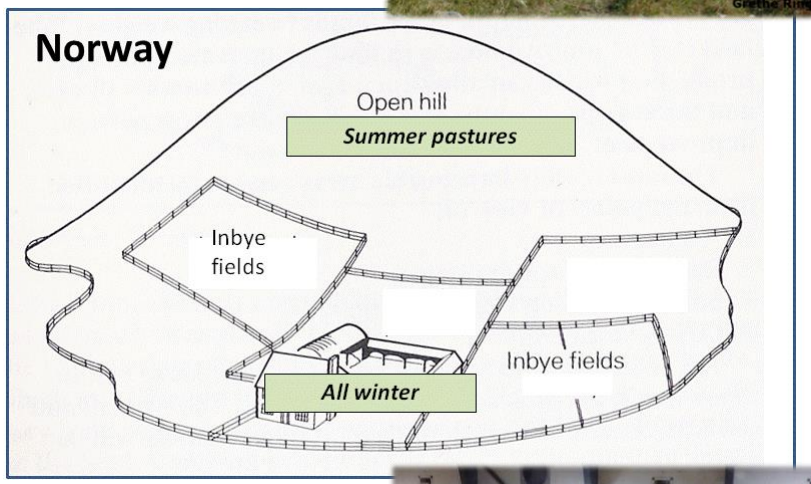
- Census data:

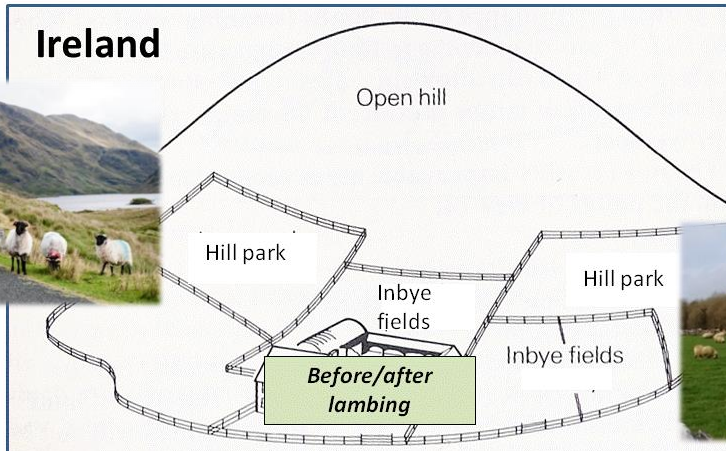
	Norway	Scotland	Ireland
Number of farms	46,600	52,300	140,000
UAA (% territory)	1 million ha (3%)	6.2 million ha (79%)	4.6 million ha (71%)
% grassland	44%	80%	78%
Sheep numbers	2.3 million	6.7 million	4.7 million
% of livestock	19%	30%	9%

Eurostats, Scottish Government

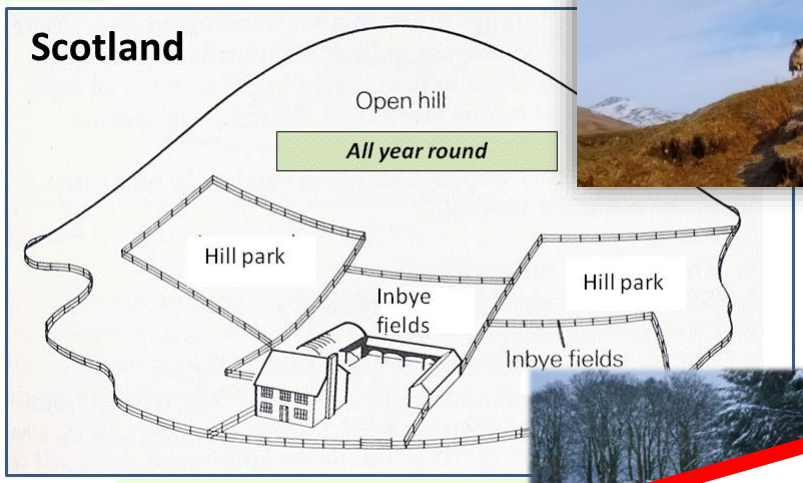
2. Husbandry systems

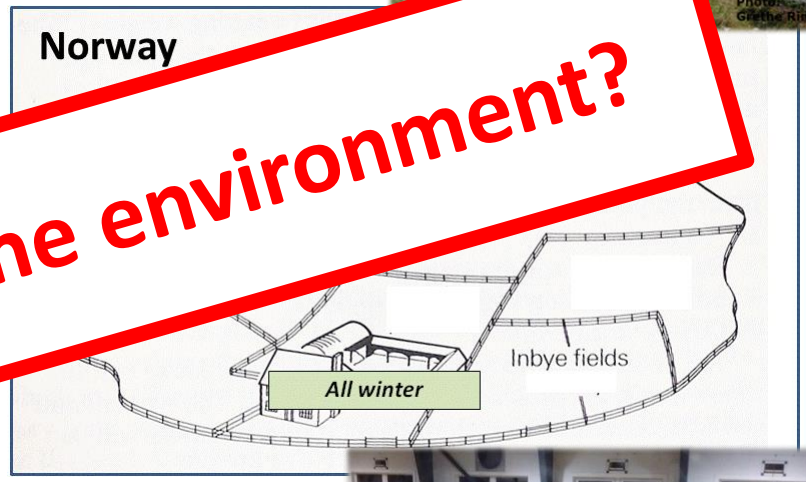




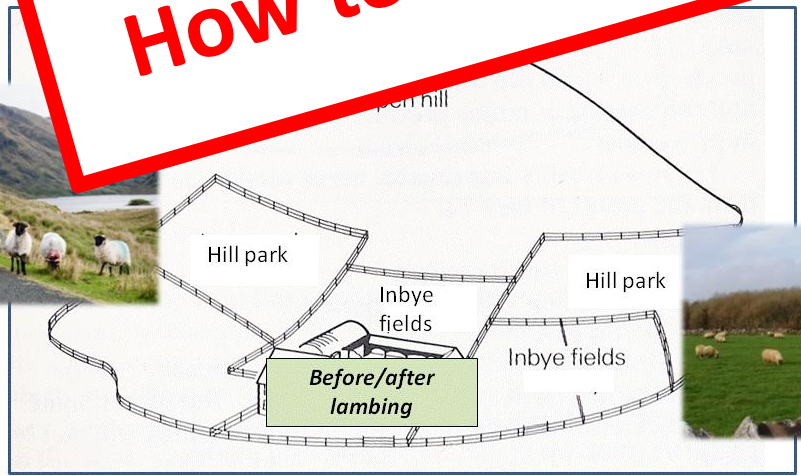


2. Husbandry systems





How to adapt to the environment?

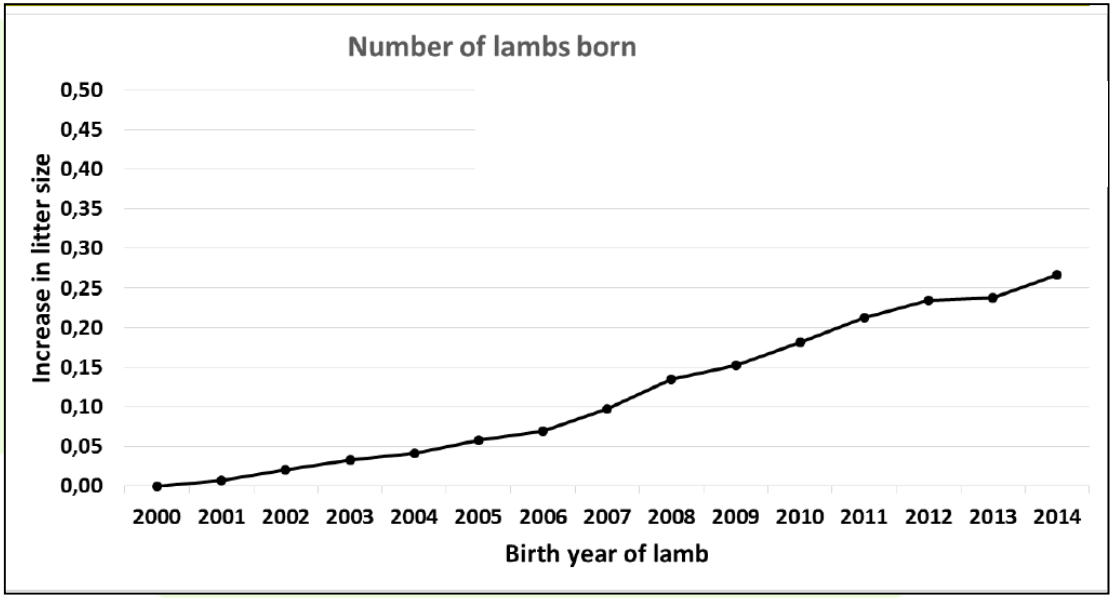


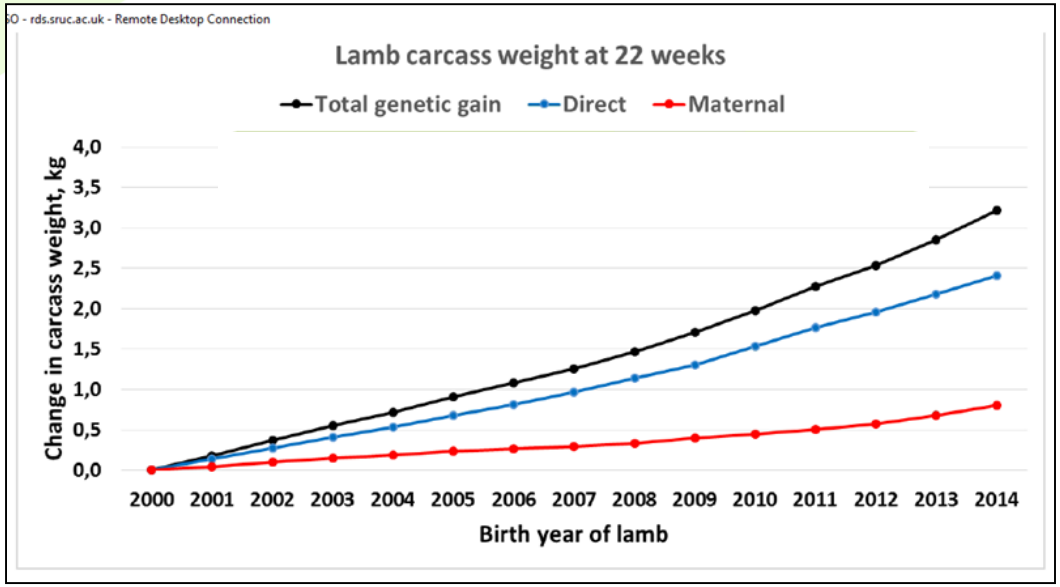
3a. Breeding strategies - Norway

NKS	Heritability h^2	Weight in the total merit index
Lamb traits		
Growth, carcass weight at 22 w.	0.12	24 %
EUROP conformation score, at 20 kg	0.19	18 %
EUROP fat score, at 20 kg	0.19	11 %
Fleece weight, at 20 kg	0.33	2 %
Fleece grade, at 20 kg	0.08	0 %
Ewe traits		
Maternal ability, at 6 weeks	0.06	15 %
Maternal ability, at 22 weeks	0.05	24 %
Litter size, total born	0.13	6 %

Source: NSG, Thor Blichfeldt

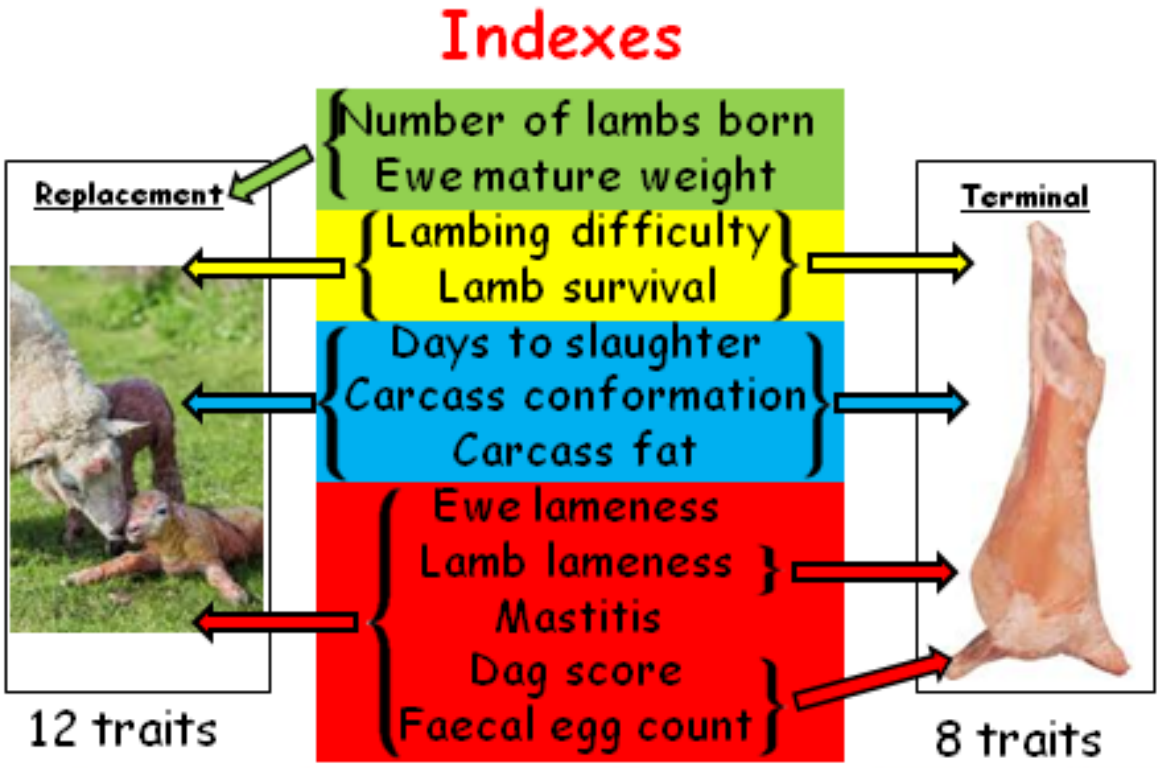
3a. Norway – some results





Source: NSG, Thor Blichfeldt

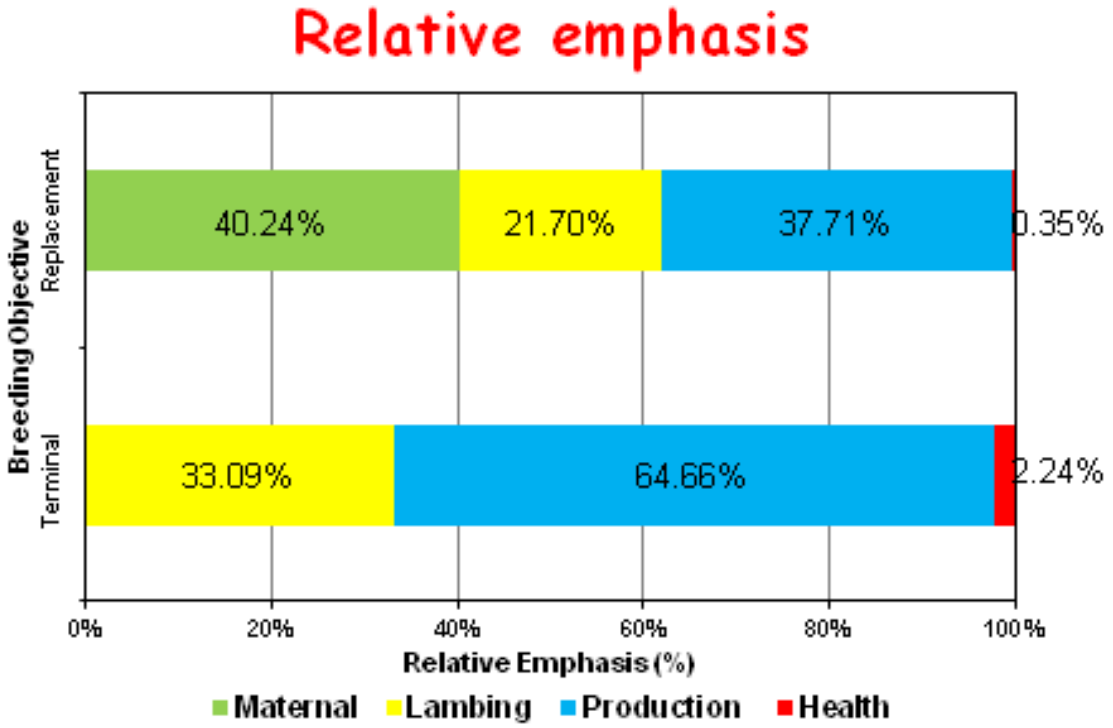
3a. Breeding strategy - Ireland



The Irish Agriculture and Food Development Authority

Sources: SheepIreland (Eamon Wall) & Teagasc

3a. Breeding strategy - Ireland

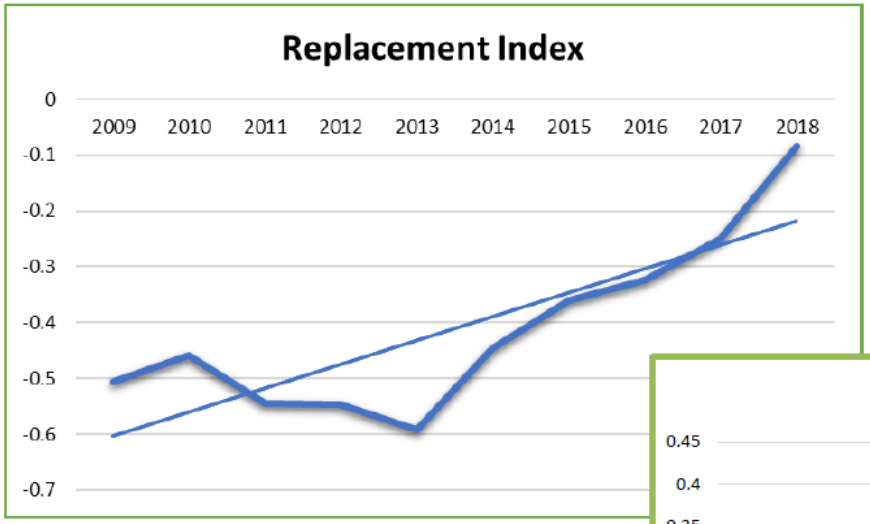


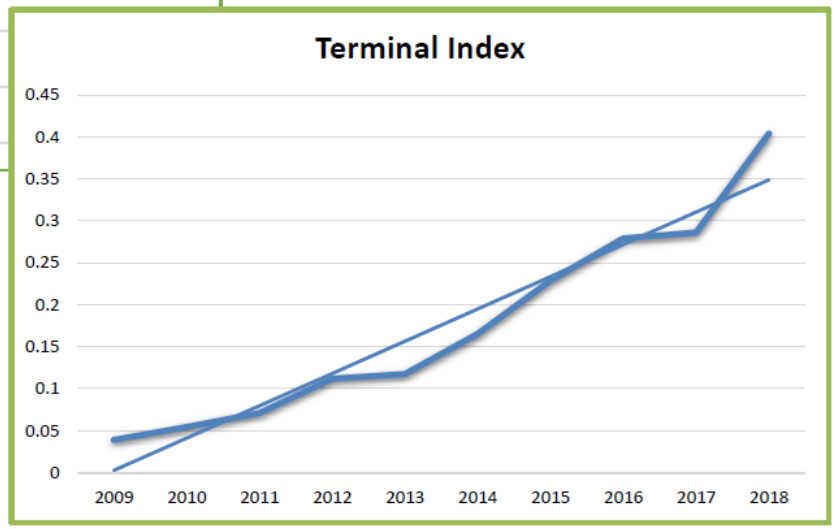
The Irish Agriculture and Food Development Authority

Sources: SheepIreland (Eamon Wall) & Teagasc

3a. Ireland – some results

Genetic Gain





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

Sheep Ireland: Profit through science

Sheep Ireland www.sheep.ie

Source: Eamon Wall, SheepIreland

3a. Scotland: Hill Sheep Selection Index

Ewe Breeding Goal Traits	Lamb Breeding Goal Traits
Mature Size	Lamb weaning weight
Longevity	Carcass fat class
Lamb Loss	Carcass conformation
No. of lambs reared	Carcass weight
Av. weight of lambs weaned	
Fleece weight	

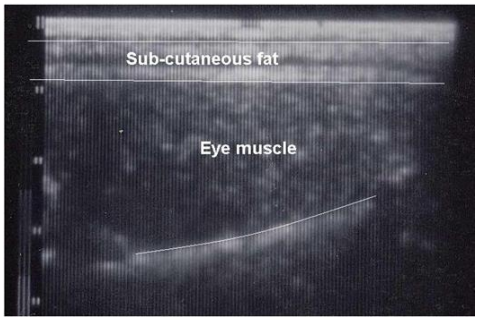


3b. Research initiatives – Scottish example (1)

Hill sheep selection index (1999-2011)

- Tested using 3 different lines:
  - Selection – high EBV animals
  - Control – average EBV animals
  - Industry – animals selected on appearance

Ewe Index Traits	Lamb Index Traits
Pre-Mating Live Weight	Weaning Weight
Age at culling or death	Ultrasonic Fat Depth
Lambs lost birth – wean	Ultrasonic Muscle Depth
Litter size at weaning	
Av. Wt of Lambs Weaned	
Fleece Weight	



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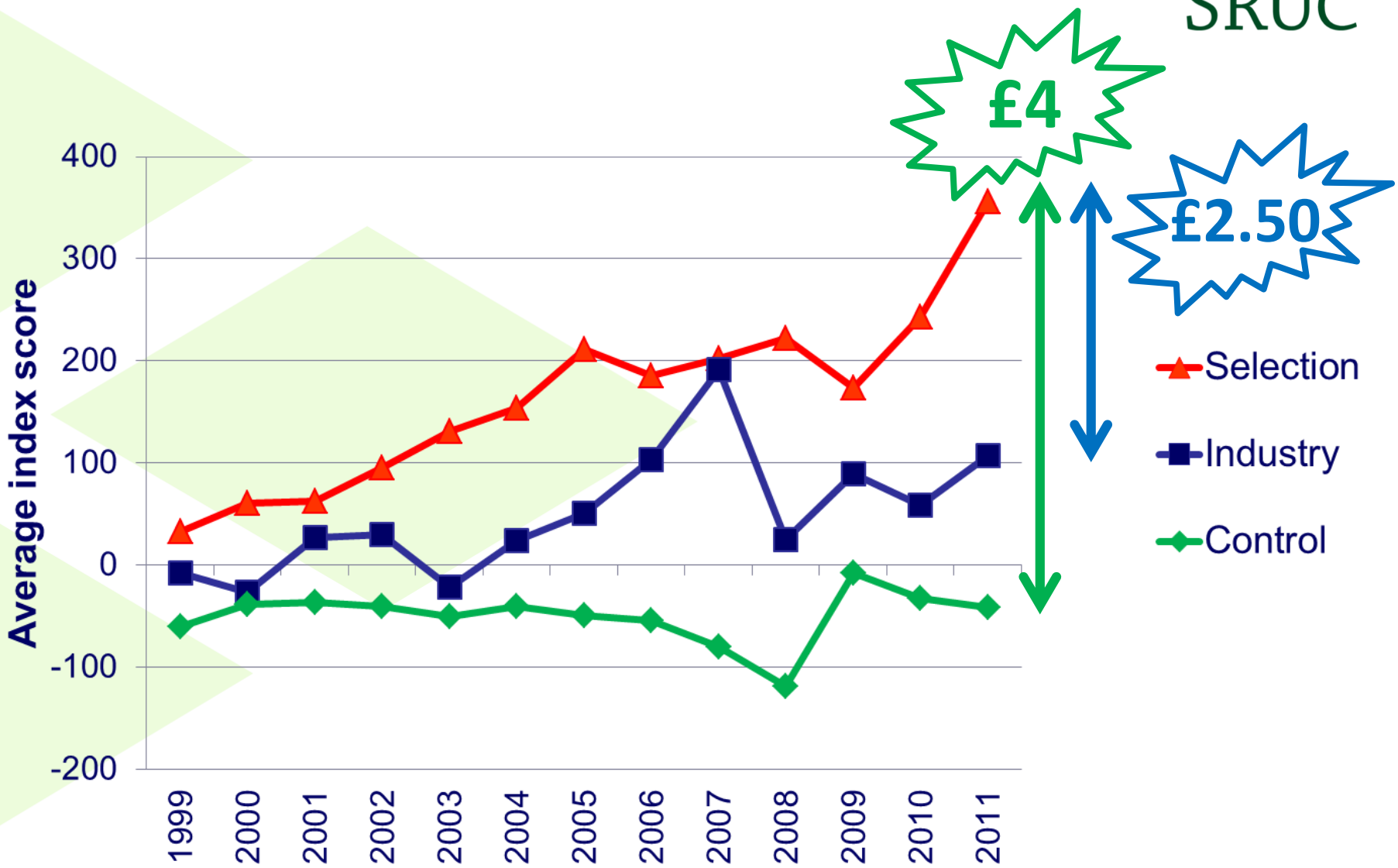
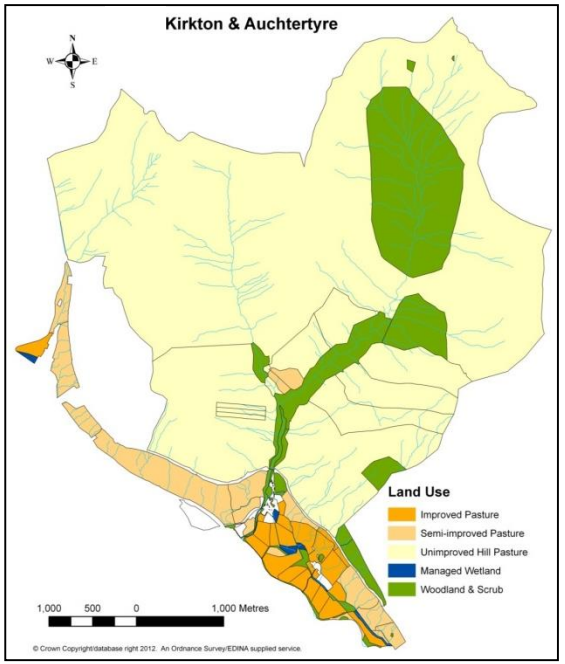
3b. Hill sheep index results



Ann McLaren & Nicola Lambe (SRUC)

3b. Scottish example (2)

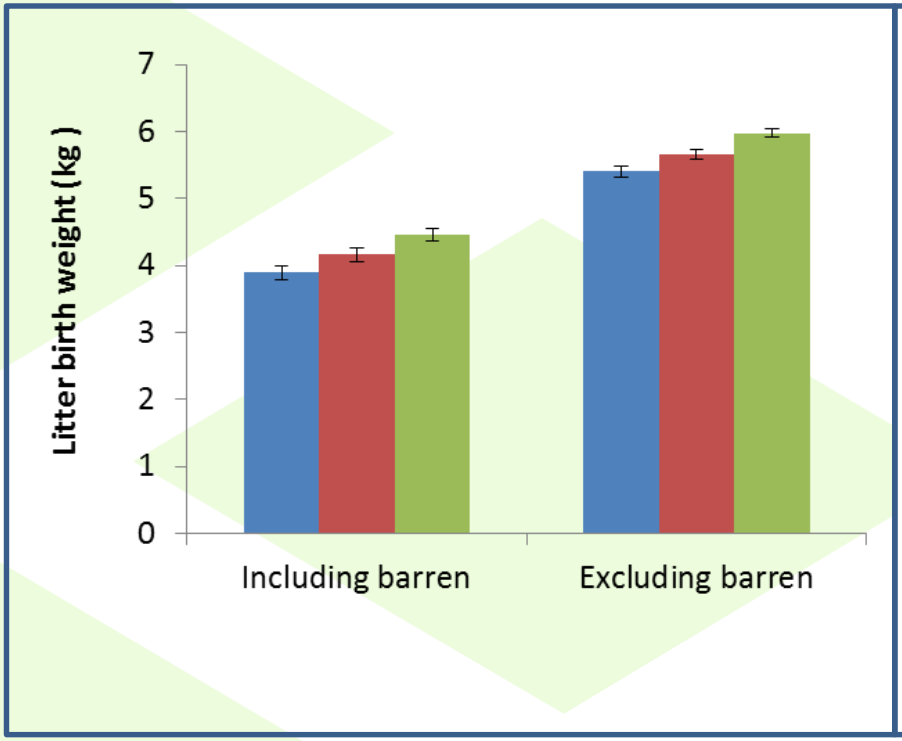
Genetics or breed substitution?

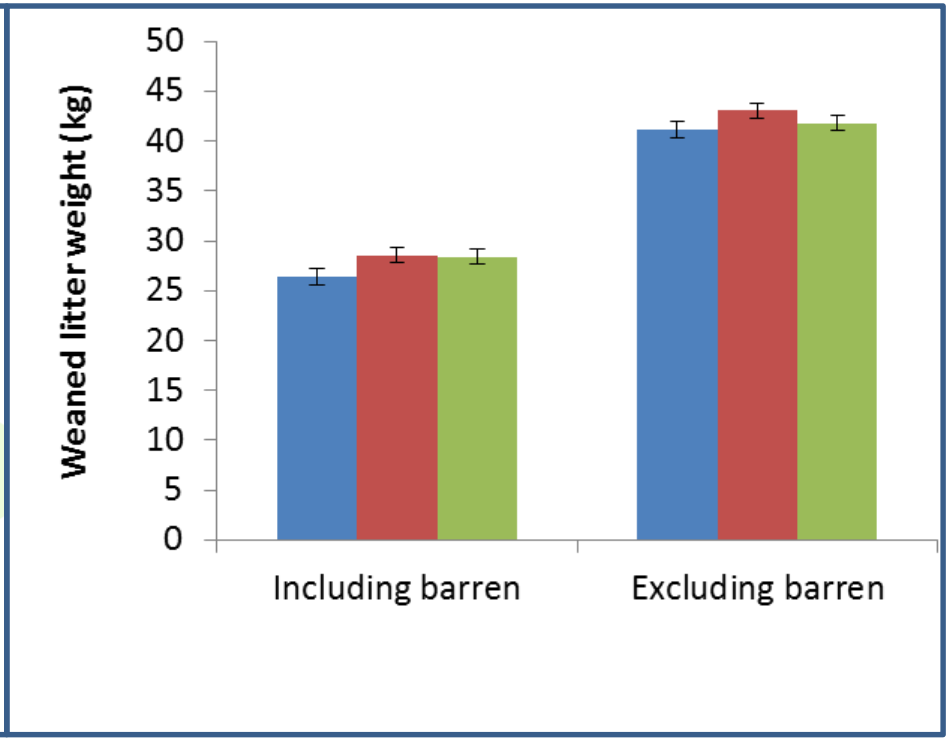


- Systems experiment
- Hill farm – 2200 ha
  - 3 lines:
    - 900 sheep from 2011-2016
    - 600 sheep from 2016-onwards
- Continuation of the HSB index but with 3 ≠ lines
  - Selection – high EBV Blackface
  - Control – average EBV Blackface
  - Lleyns – selected on EBV

-> **breed improvement vs breed substitution**

3b. Some results – 2013-2015





CBF SBF Lleyn

Ping.Zhou@sruc.ac.uk

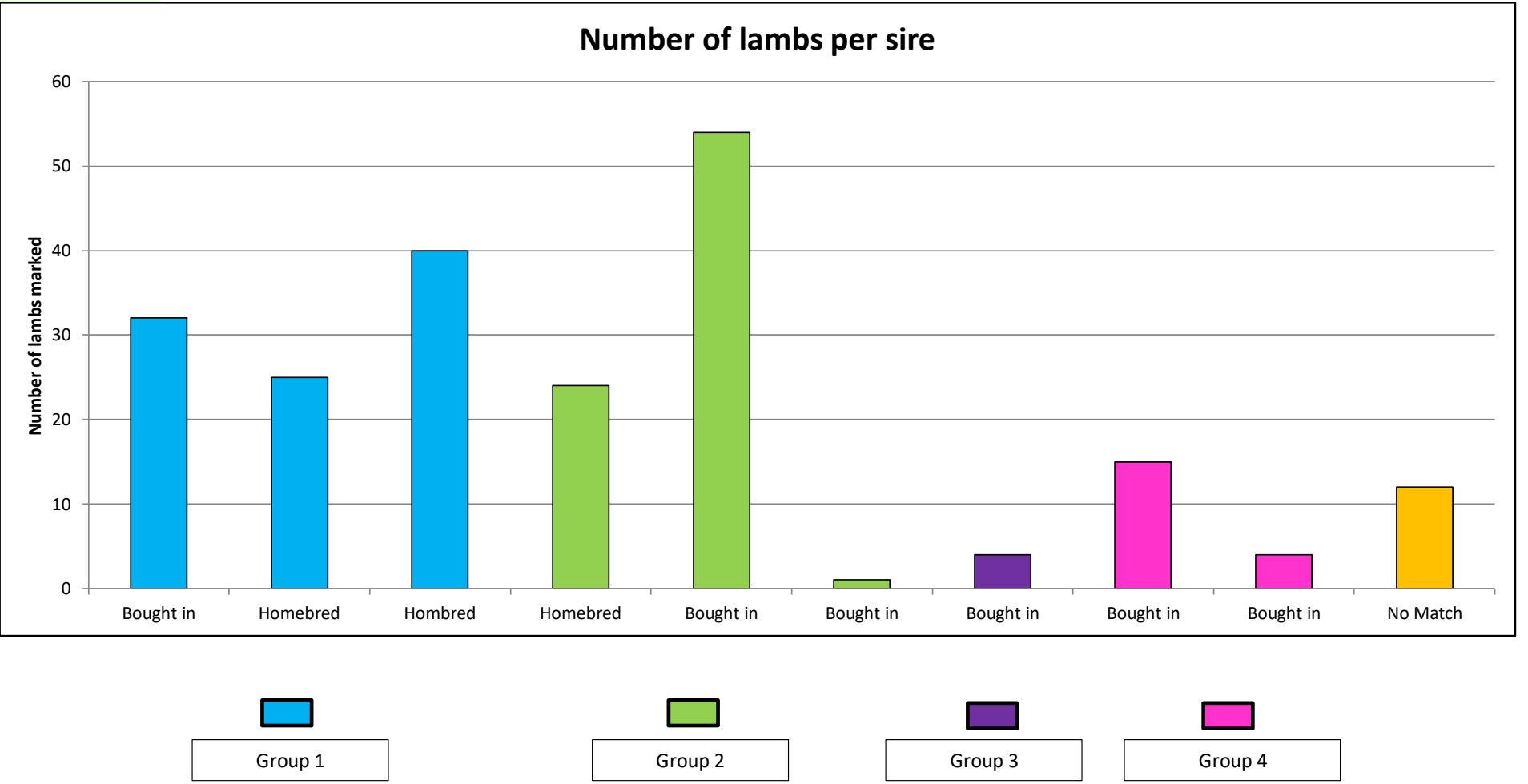
3b. DNA parentage

- Testing ram and ewe performance in a high mountain environment
- Pedigree information identified using NZ Shepherd+ DNA test.
  - First year - Requires a tissue sample from all ewes, lambs and rams.
  - Subsequent years just lambs and any new rams.

- Allows multi-sire mating groups
- Less labour required at lambing
  - Gathering pedigree and performance information

Jenna.Kyle@sruc.ac.uk & Nicola.Lambe@sruc.ac.uk

3b. 2015 results

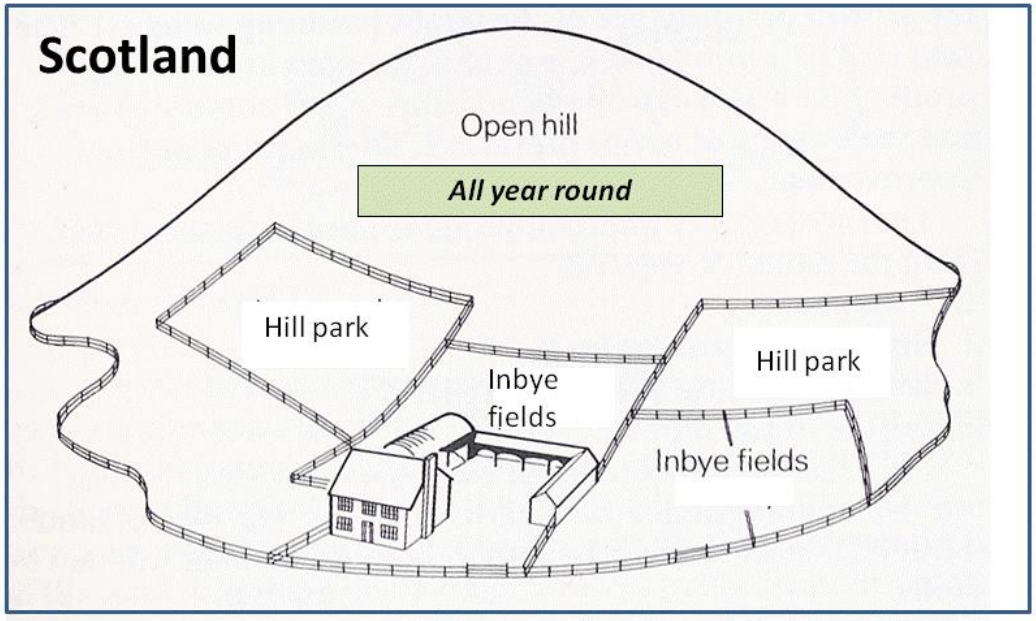


Jenna.Kyle@sruc.ac.uk & Nicola.Lambe@sruc.ac.uk

3b. Scottish example (3)

Optimised use of grazing?

- Some farms have more inbye than hill
- Trade-offs?

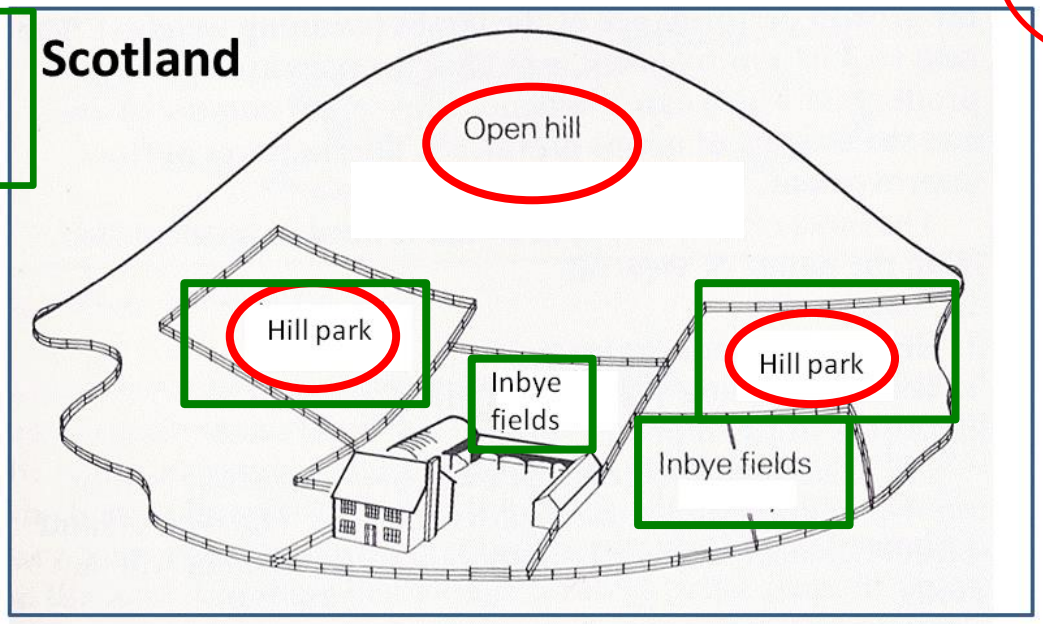


3b. Scottish example (3)

Optimised use of grazing?

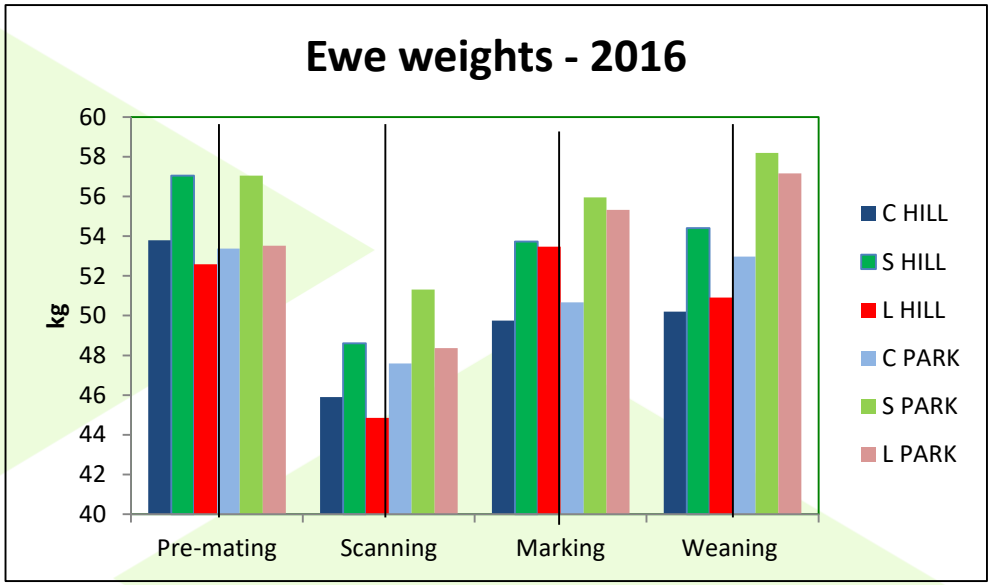
- Some farms have more inbye than hill
- Trade-offs?

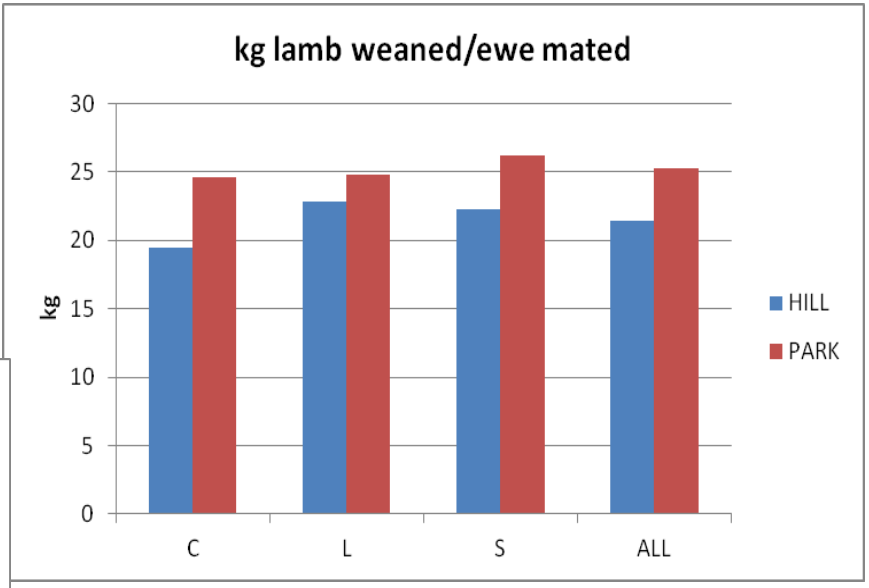
PARK FLOCK
300 ewes

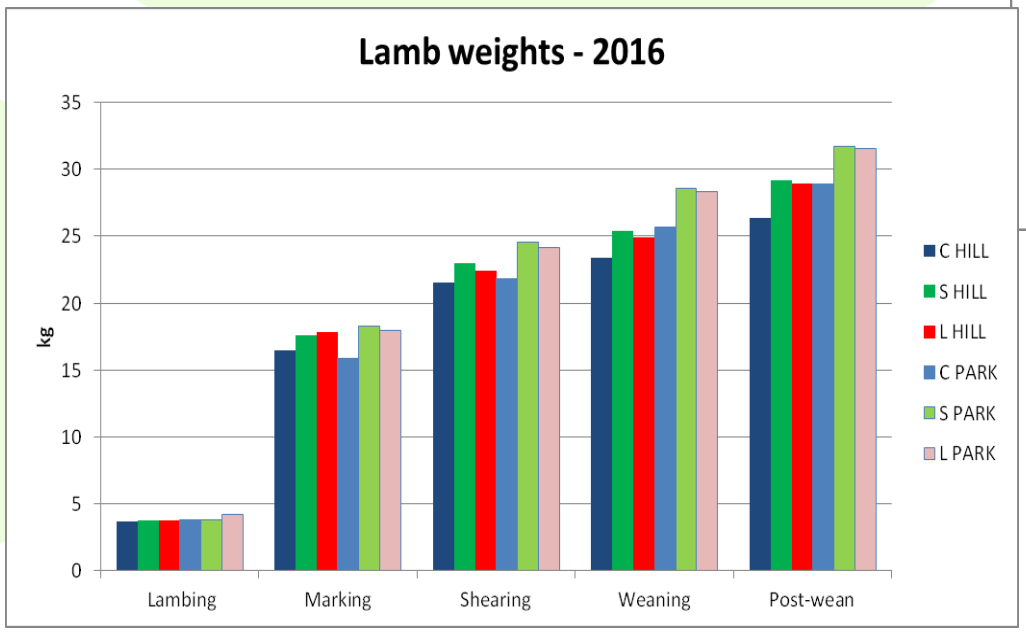


HILL FLOCK
300 ewes

3b. Performance 2016



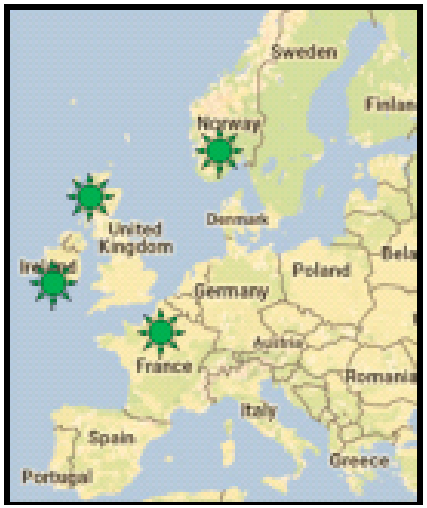




4. SusSheP - Sustainable Sheep Production

SusShep is a 3 year ERA-NET European project (2017-2020), with 4 European partners:

Norway, France, Ireland & UK.



Overall aim: to increase the sustainability and profitability of European Sheep Production by addressing key industry focused problems.

Key objectives :

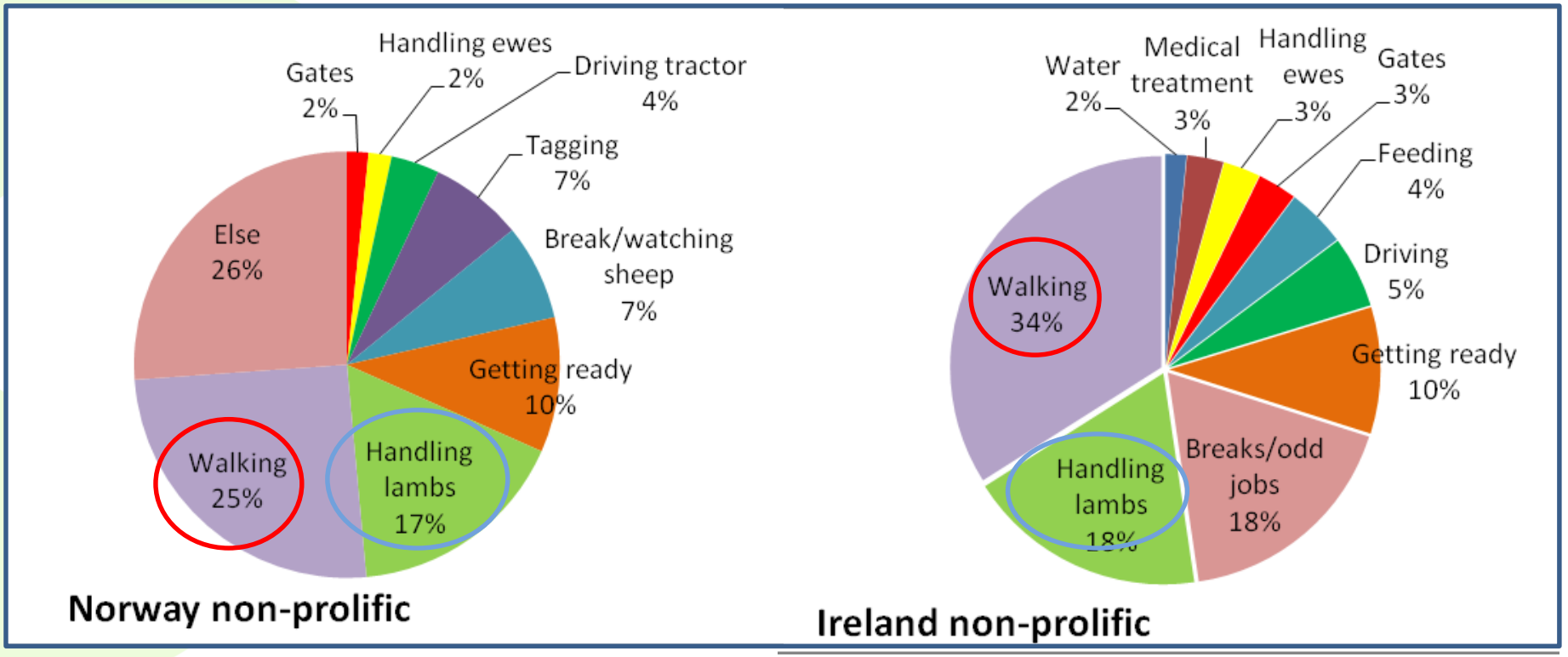
- Provide **new genetic tools** for farmers to increase **longevity** of ewes.
- Quantify **labour input** and **carbon hoofprint** in contrasting sheep systems.
- Develop more socially acceptable **methods of AI,** looking at **ewe breed effects** (for oestrus, cervical mucus, sperm transport).
- Maximise **knowledge transfer** and uptake of methods by farming community.

4. Labour - Goals

- To characterise **labour input** and **carbon hoofprint** of different sheep production systems (SPSs)
  - 20 focus flocks:
    - With/without PLF:
      - 4 in the UK, 2 in Ireland
    - Prolific/non-prolific breed:
      - 4 in Ireland, 2 in Norway
    - With/without high genetic gain
      - Indexes (4 in the UK)
      - AI (4 in France)

4. Examples of labour profiles

- Tasks between systems: at lambing



- Similarities/differences between systems
- Quantify labour difference between systems

5. Initiatives to drive uptake

- Norway – Ram Circle and NSG
- BETTER farm Sheep Programme in Ireland

  https://www.teagasc.ie/animals/sheep/better-farm-sheep/

- Highlands & Islands Sheep Strategy /Scottish Sheep Strategy in Scotland
- SusSheP

6. Conclusions

- Similar issues but different adaptations/initiatives
- Differences between easiest environment to harshest *(Ireland – Norway – Scotland)*
- Research to adapt systems to the environments
- European led initiatives should help link these systems

Adaptation is key!

Right genetics in the right place

Right management of grazing resources



Acknowledgments

All my SusSheP & SRUC colleagues & students

- Funders

- **CORAM**