Sheep Industry consultation meeting



Killeshin Hotel, Portlaoise Thursday 18th December 2014







Teagasc Sheep Research Programme

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Sheep Ireland Meeting, 18th December 2014





- 33,500 Sheep producers Nationally
- 2.5 million ewes
- Average flock size < 100 ewes
- Low weaning rate 1.3 lambs /ewes
- 81% of lamb meat exported
- Efficient lamb production give very good incomes
- Increased lamb prices from 2010
- Significant scope for increasing output at farm level & nationally
- Food Harvest 2020
- Greater use of grazed grass
- **Anthelmintic Resistance**
- **STAP**



Teagasc Resources

Staff

- Research, Technical, Farm Staff
- Flocks
- 1200 ewes including 350 Pedigree (Suffolk, Texel, Belclare)
- Replacements (n=250)
- Rams (n=100)
- Store lambs (n=240)
- 13 BETTER farms (n~ 4000+ ewes)

Laboratories (Athenry & Grange)

Land

• 128 ha



Overall & Specific Objectives of the Sheep Programme

Increase the <u>productivity</u>, <u>sustainability</u> and <u>competitiveness</u> of Irish sheep production systems

- Increase production efficiency –Grazed grass
- Increase the rate of genetic gain
- Adopt best practices in relation to animal health
- Improve product quality
- Enhance knowledge transfer to drive farm efficiencies
- Provide Leadership to the Sheep Industry



Research Programme Staff

Programme	Research Staff	Collaborators
Research-Demonstration Farm & Variety Evaluation	P. Creighton, N. McHugh & M. O'Donovan (MP) WF (Elizabeth Earle)	T. Boland (UCD), & D. Grogan (DAFM)
Lamb Meat Quality	M. Diskin, A. Moloney, P.Allen (Ashtown), WF (Noel Claffey)	F. Monaghan, N Brunton (UCD) L. Farmer
Age at lambing, Ewe lifetime Performance Trace elements	T. Keady	University of Nottingham
Flock Health	B. Good & O. Keane (GR)	G. Mulcahy, T. De Waal T. Sweeney (UCD) & QUB S. Galloway & G. Davis (NZ)
Genetics	N. McHugh. D. Berry. M. Diskin WF (Alan Bohane)	A Fahey (UCD) , Sheep Ireland J. McEwan (NZ)
BETTER Farm	M. Diskin, C. Lynch	Frank Hynes, Shane McHugh & Michael Gottstein. Advisors/Veterinarians



Knowledge Transfer Sheep Programme 2014

Michael Gottstein



Overview

- Public Events
- BETTER Farm Programme
- STAP Year 2 Preparing for Year 3
- Public Events
- Other initiatives





Public Events

- Sheep Conferences (2014)
 - Hill Sheep Conference Bantry (350)
 - National Conference Athlone (600)
 - National Conference Donegal (800)
- Public Events
 - 10 on farm/mart & Athenry (June Sept)
- Regional Sheep Seminars this Autumn





Technology Transfer (Sheep Team)

70 Advisers with sheep groups

- 150-180 clients
- 200 consultations
- SFP, AEOS, TAMS etc
- ePM, Derogations, Fertiliser Plans
- 3+ discussion groups (cattle & Sheep)

3 Specialists & Research Colleagues

Outside Agencies

- UCD
- Sheep Irl
- Bord Bia
- Industry





BETTER Farm Programme

Eight Lowland Farms

- Kerry (2013)
- Tipperary (2013)
- Kilkenny
- Wexford
- Louth (2013)
- Roscommon
- Leitrim (2013)
- Donegal

Three Hill Farms

- Donegal
- Sligo
- Mayo

Potential New Farms

- Donegal
- Kildare
- Mayo
- Westmeath
- Wicklow (Hill)
- Cork (Hill)



Plans for 2015

STAP Year 3 Revised STAP Programme 2016

• Input into revised scheme

Sheep 2015 – Athenry 20th June 2015

Sheep Conferences

- 1 Hill Conference (Westport 28th January)
- 2 Lowland Conferences (Killarney 3rd Feb & Trim 4th Feb)
- Industry event with keynote speakers



Other Issues

Annual Selection of new BETTER farms

You Tube Clip – key skills – Lameness & Drench Test https://vimeo.com/96799237 2015 – Breeding (Ram & Ewe), Grass Mgt, Finishing Lambs

Technical Support for Private Consultants

- 8th October (n=25)
- More in 2015





Tommy Boland School of Agriculture, Food Science and Veterinary Medicine









Facilities

- 350 mature ewes
- 100 ewe lambs
 - Synchronised lambing 2nd wk March
- CPT flock and ram testing centre for Sheep Ireland
- Housing for 550 sheep
- Individual Feeding Facilities for 100 sheep
- Animal digestibility facilities for
 - 30 sheep
- Mobile handling facilities
- Artificially reared lamb facilities







Current Sheep Nutrition Research Projects – UCD lead

Understanding the impact of maternal nutrition on subsequent offspring performance - Fiona McGovern, IRCSET funded

Nutrition as a driver of flock performance – Frank Campion, Walsh Fellowship Teagasc



The effect of multi-species pasture mixtures on ewe and lamb performance – Bridget Lynch and Connie Grace, DAFM Stimulus

Industry Funded Research

- Artificial lamb rearing
- Trace element supplementation
- Energy supplements during pregnancy and lactation



Collaborative research work with Teagasc

RAPIDFEED - Development, calibration and validation of feed intake methodology to rapidly screen dairy, beef and sheep for feed intake and efficiency. Emer Kennedy PI, DAFM stimulus

OVIGEN – Multibreed sheep genetic and genomic evaluations. Noirin McHugh PI, DAFM stimulus



Other sheep research areas in UCD

- Meat quality RAMLAMB: Frank Monaghan and Alan Fahey
- Parasites Torres Sweeney, Theo de Waal, Grace Mulcahy
- Flock Health Michael Doherty



Collaboration

- Teagasc:- Research and Advisory
- Sheep Ireland
- International: UK, France, NZ, Australia

Minimise duplication Complementary research programs





Sheep Ireland Update













Sheep Ireland - Some Info

- Began in 2009
- Followed on from PSBIP (LMI)
- Little genetic progress in past 30 years
- 2.5 million breeding ewes
- 80,000 rams 20,000 needed per annum
- In 2014 SI performance recorded 10,000 Pedigree ram lambs
- Over 35,000 lambs performance recorded (Including Pedigree & Commercial)





Ewe breeds Vs Recorded breeds



2014			
Breed	No. of Performance recorded Lambs		
Texel	4944		
Charollais	4557		
Suffolk	3379		
Belclare	1679		
Vendeen	457		

Figures are taken from the NFS 2011



Sheep Ireland: Profit through science



What does Sheep Ireland do?

- Ram looks are certainly important!!
- Not always a good indicator of future performance
- €uroStars use data to 'back-up' the looks







What does Sheep Ireland do?

Genetic Evaluations in action:



Super ewe

- Goes in lamb every year
- Has twins every year
- No lambing difficulty
- Both lambs drafted at weaning every year
- Never lame
- Ticks all the boxes







Why €uro-Stars are important??

'Lambs separated at birth'



Farm A: Intensive Farmer

- Creep feeding
- Super grass



Farm B: Extensive Farmer

- No creep feeding
- Poor Grass





Sheep Ireland: Profit through science



Why €uro-Stars are important??





Sheep Ireland: Profit through science



Sheep Irelands Catalogue

Lot:	Owner: Breeder:			
Anin	nal	Ancestry	€ uro-S	Star Indexes 06/10/2014
IE042868504	040G	GS Glenside Razzle Dazzle GS FPG1000055	Replacement (€ 1.44 Acc 40% Rank Top 3	I5) Terminal (€ 0.786) 3% Acc 43% Rank Top 1%
MDI13040 Ballybur		GD Curley TYC09016	*****	*****
DOB:28-Mar-	2013	♥ Oberstown Tornado PFI12026	Lamb Survivability (0.331%)	Poor Excellent 0% Top 16% V Acc 36% 100%
Texel		Ballvbur	Days to Slaughter -7.547 days	0% Top 1% ¥100%
Male		MDI11033 A Baileys One And Only	No. of Lambs Born (€ 0.27)	0%Top 25% ✔ 100%
Twin		GS EBE08004 GD Ballybur MDI07025	(€ 0) Daughters Milk (€ 0)	0%Top 44% V 100% ▲ Acc 29%
Comment:				





Sheep Ireland: Constraints

- No CMMS
 - Every Flock is manually set up and updated
 - Rams can not be tracked once sold (commercial)
 - ICBF model is not yet in place in sheep
- Pare Average acc% of a new born calf in Ireland is

0.55

• Average acc% of a new born lamb in Ireland is

0.18

- Number of traits
 - ~15 in sheep
 - ~35 in cattle
- Data being recorded
 - Need to significantly increase volume of data
- Average pedigree and commercial flock size is small





Sheep Ireland - Structure

- LambPlus (Pedigree Data)
 - 600 flocks in 2015
- MALP (Maternal Lamb Producers Group)
 - 3500 ewes single sire mated
 - Commercial data
- CPT (Central Progeny Test)
 - 2500 ewes AI'd in Oct 2014
 - Commercial data







Number of LambPlus Breeders





Sheep Ireland: Profit through science



Ram search



Home Services - Publications -

News About Sheep Ireland -

Search

NewThe Ram Searchhad over **38,000**hits last year

Sheep Ireland have launched the first phase of its new and improved performance recording screens which are available to all Sheep Ireland users

To find out more click here

Online Services New Sheep Ireland Application Available Dec. 15th 2014

Sign In

Click here to find out more

Ram Search

• NSIS, Flockbook Number, Tattoo

Name or part of name

NSIS, Flockbook No, Tattoo or Name

earch

Advanced Ram Search >

Help Video >



Sheep Ireland: Profit through science



Any Questions?





Sheep Ireland: Profit through science



Introduction to Animal Breeding & Genomics

Donagh Berry Teagasc, Moorepark, Ireland

Donagh.berry@teagasc.ie



Traditional Animal Breeding



Lamb has 40 day weight of 19 kg
Ram accuracy 18%





- Ram has 100 lambs on the ground
- More of his DNA expressed in the population
- Ram accuracy increases to ~60%



Using technology of today









Dairy calf BV accuracy increases to ~ 76% Equivalent to 54 daughters milking



DNA - From the tip of your nose to the tops of your toes!!



DNA is the same in every cell of your body and doesn't change throughout your life



How do we use this DNA information?









www.sheep.ie







Operational system





What is a SNP?

•99.9% of human DNA is identical – most of the differences are in the form of SNPs





How do SNPs relate to performance?

SNP	Var	40 day wt	Number lambs
1	A	+5	-0.6
1	G	+20	-0.4



Genomic selection

- Increase <u>accuracy</u> of selection at a <u>younger age</u>
- Traditionally used parental information
 - Progeny = $\frac{1}{2}$ mother + $\frac{1}{2}$ father DNA
 - Progeny = average of mother & father BVs
 - Assumed full sibs were identical
- Available SNP information can be used to supplement the traditional approach
 - See difference in full-sibs at birth



Indentifying Mendelian sampling term





Why not 100% accurate?

- Performance is typically affected by more than one gene
 - Up to 80% of human stature attributable to genetics no major gene found to date
- Genes may influence more than one characteristic
- Genes interact with one another
- Genes interact with the environment



To Conclude

- Differences seen between individuals of a species are mostly due to SNPs (tiny pieces of DNA)
- We can relate SNP variants to performance
 - Genomic selection









OVIGEN Multi-breed sheep genetic and genomic evaluations





Industry Meeting, 18th December 2014





- Genetic gain levels remain low
 - Farmer confidence \rightarrow accuracy levels
- Can improve accuracy (and genetic gain):
 - 1. More on farm recording
 - 2. Parentage data
 - 3. Superior genetic evaluations
 - 4. Genomic selection



Objectives

- 1. Increase accuracy
- 2. Develop across-breed genomic selection
- 3. Reduce fluctuations in star ratings









Phenotypes

- Other phenotypes
 - Lambing: lamb vigour, mothering ability

Results: more accurate data for genetic evaluations

- New web screens \rightarrow aid better recording
- Integration of all flockbooks
- Data Quality Index



The Irish Agriculture and Food Development Authority

K

Traditional Animal Breeding



How can we improve the accuracy?

- Lamb has 40 day weight of 19 kg
- Ram accuracy 18%





International data





International data



Steps

- 1. Identify foreign animals in national database
- 2. Agreement on sharing of genetic information
- 3. Research phase
- 4. Implementation

Research underway: Eblex in UK... (for Texel and Charollais) France (for Vendeen) & NZ (INZAC flock) Others???



Genomic Selection



Objectives

1. Genotyping informative animals

2. Implement national genomic evaluations



Genotyping proposal

- Genotype ~12,000 animals
- Prerequisite to genotyping → MUST have data in Sheep Ireland
 - Without this genomic selection is useless
- Proposal
 - Genotype all pedigree ewes and rams from the breeds with sufficient data



First job - Population structure



Predicted numbers of pedigree sheep to be recorded in 2015					
	No. Sires	No. Dams			
Texel	355	3,150			
Genotype all ewes and rams					
Suffolk	220	2,170			
Belclare	74	828			
Vendeen	62	290			









"Other" breeds

- How do we get genomics??
- 1.MUST have more data in Sheep Ireland
 - Without this genomic selection is useless
- 2. Investigate cheap parentage options
 - Ultra low cost options will be investigated







What do I need to do and when??



Project Rollout

- All DNA collected by Sheep Ireland
- SI mobile Pratley to visit all flocks

- Proposed begin date Spring 2015
 - Will differ depending on breed
- Minimum once lambs are old enough to handle







DNA Collection

- Great opportunity to collect data:
 - Weigh ewes
 - Collect BCS
 - Weigh 2015 born lambs
 - Tidy all flock Inventories
 - Other possible phenotypes being considered......





Taking the DNA sample

- DNA punches to be used
- Correlated with NSIS/EID tag
- Logged on SI database
- DNA owned by 'Sheep Ireland'
- Enough DNA for other uses
- Storage location to be decided



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Take home messages

- For Genomics to work for Ireland all sectors need to contribute
- Genomics will not replace the need for hard work Performance Recording
- Genomics will deliver higher accuracies and better €uroStars as a result
- Genomics will deliver many other benefits
 - Parentage
 - Info on lethal genes
 - Info on useful genes Scrapie, Myomax, etc, etc
 - Inbreeding info





