

Lleyn Sheep Breeders Meeting – July 2020



Meeting with Samuel Boon

1). Breeding for Parasite Resistance

- Funding for Serum IgA Work

2). A New Breeding Evaluation for Maternal Breeds



EWEBenefit - Efficiency With Environmental Benefits through optimising sheep genetics

A new approach to the genetic evaluation of maternal breeds. Increasing genetic gain through the development of new breeding values, indexes and producer friendly support tools.



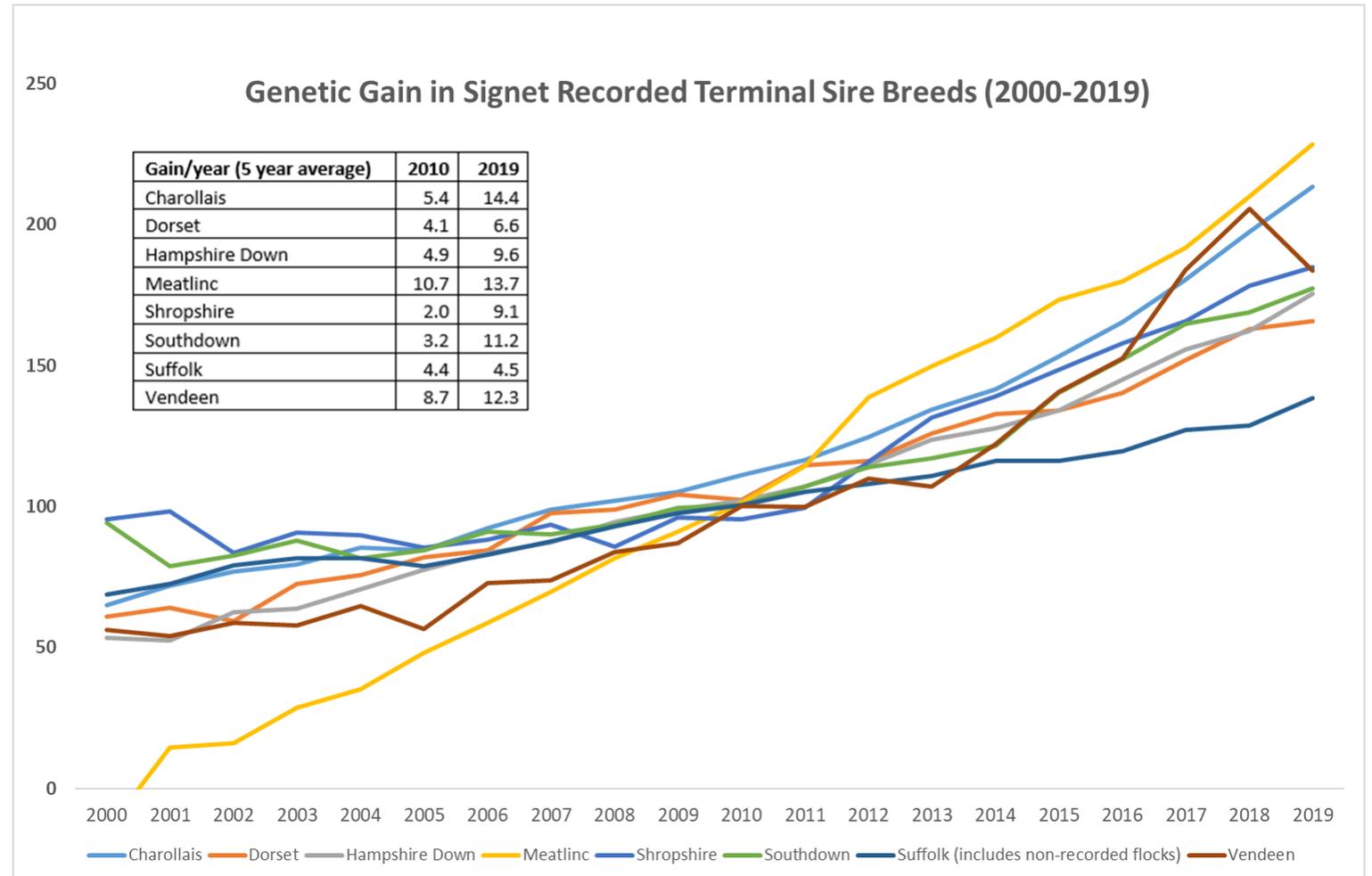
Background

Genetic gain

- Permanent
- Sustainable
- Cost effective

Highly successful in Terminal Sires in the UK.

The Terminal Sires bred to day are very different to those in the 1980's and 90's



Background

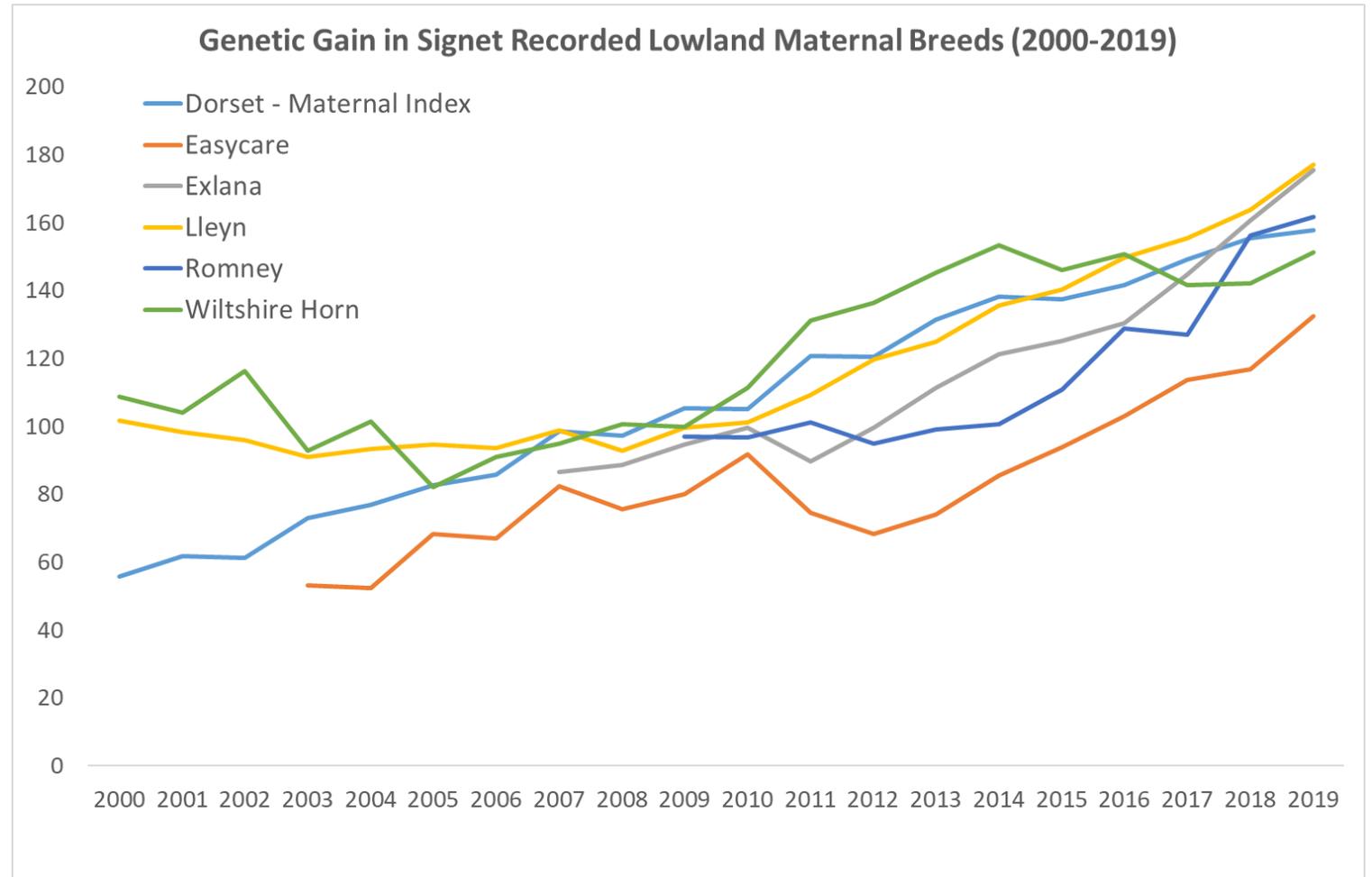
Traits in maternal programmes

- Often lower heritability
- Often longer to assess
- More of them

“Optimum” may be better than “Maximum”

Breeding goals may be antagonistic and vary more between farms.

Progress tends to be slower, but arguably more valuable



Multi-breed Evaluations – A New Approach

1. Multi-breed evaluations
 - Handle crossbred data
 - Handle commercial (crossbred) data
2. Monthly analyses
3. Old EBVs updated – latest heritability values and genetic relationships fitted
 - Move carcass traits to a weight adjusted basis
4. New EBVs introduced
 - and much easier to fit them in the future
5. New Breeding Indexes (and in this project sub-indexes)
6. New Genetic Base
 - New Approach to New “Unknown” animals

Terminal Sire Evaluations *Delivered 2018*



Hill Evaluations *Delivered 2020*



Maternal (Lowland) Evaluations
Developed as part of CIEL co-funded initiative

Aim of the New Maternal Sheep Evaluation

- A new multi-breed, monthly analysis which delivers EBVs for a greater range of economically important traits.
- Specifically it needs to:-
 - Take into account hard to measure traits like lamb survival and ewe longevity
 - Incorporate crossbred and commercial data
 - Include abattoir derived information
- Create indexes that:-
 - Focus on ewe efficiency, rather than simply output.
 - Include non-linear weightings for traits where higher values may not optimise flock performance.
- Express change in environmental and economic terms
 - Showing the wider value of genetic improvement in achieving environmental goals

Breeds involved....



| BREED | NUMBER OF RECORDS |
|------------------|-------------------|
| BLUEFACED LEICS | 40794 |
| BORDER LEICESTER | 19616 |
| EASYCARE | 48762 |
| EXLANA | 46431 |
| JACOB | 1388 |
| LLEYN | 511907 |
| ROMNEY | 73907 |
| ROUSSIN | 4629 |
| WILTSHIRE HORN | 15604 |

- The breeds involved include Lleyln, Romney, Exlana, Roussin, Easycare, Wiltshire Horn, Jacob and composite maternal breeding lines.
- It will include Bluefaced Leicester and Border Leicester data though it is noted these are crossing breeds and understood they often have a different industry role.

Three stages to the project

- **Stage 1.** Development of a new genetic evaluation
- **Stage 2.** Index development
- **Stage 3.** Industry engagement
Development of simple sub-indexes



Stage 1. Development of a new genetic evaluation

1.1 Phenotype collection

AHDB to work with breeders to enhance the existing dataset through phenotype collection for:

- Ewe mature size
- Body condition score
- Abattoir traits
 - If they exist, we know we have some via RamCompare



Stage 1. Development of a new genetic evaluation

1.2 Update genetic parameters and develop new traits. Consider a two part analysis

Part A. Growth and Carcase

- Birth Weight
- Lambing Ease (non-birth weight adjusted)
- Maternal Ability
- Eight Week Weight
- Scan Weight
- Muscle Depth (weight adjusted)
- Fat Depth (weight adjusted)
- Mature Size (to be known as Shearling Weight)
- **Mature Size – New trait**
- **Body Condition Score – New trait**
- **Carcase weight***
- **Days to slaughter**
- **Conformation**
- **Fat class**
- *Feed efficiency - In the future when we have phenotypes*

Part B. Reproduction and Health

- Litter Size Born
- Litter Size Reared
- Lamb Survival (without birth weight restriction)
- FEC Strongyles
- FEC Nematodirus
- Saliva IgA
- *Serum IgA – In the future (subject to funding)*
- Age At First Lambing
- Lambing Interval
- Longevity – Updated to omit certain fate codes

Stage 1. Development of a new genetic evaluation

1.3 Update lamb survival EBV

1.4 Update ewe longevity EBV

1.5 Develop new ewe mature size and BCS EBVs

- Consider how ewe mature size records should be analysed and adjusted to take into account:
 - Age
 - Number of days since previous lambing/lamb rearing event
 - Number of lambs weaned at previous lambing event
 - Body Condition Score (or lack of BCS)
- We are considering the ewe mature size is assessed as two EBVs taken within two different weighing windows:
 - One 0-165 days post lambing (To be known as “Weaning weight” – when sheep are rearing lambs and mobilising weight)
 - One 165+ days post lambing (To be known as “Pre-tupping weight” – when body condition score across the flock is more likely to be consistent and a “true” reflection of overall size)

Stage 1. Development of a new genetic evaluation

1.6 Introduce EBVs for carcass traits (based on knowledge from RamCompare)

- These will be “stand alone” to start with.

1.7 Review genetic parameter findings

- Compare all genetic parameters to those currently used for Lleyn and the multi-breed hill dataset.

1.8 Model development

- Create model
- Review scaling requirements and compare breed differences at a phenotypic and genetic level.
- Develop and agree a simple approach to genetic group solutions.

Stage 2. Index development

Create a breeding index based on economic approaches to enhance ewe efficiency, providing both a sensitivity analysis and an assessment of its environmental impact.

2.1 Index creation

- Incorporating a non-linear index weighting for prolificacy (to avoid high numbers of triplets).
- Model the impact of restricting ewe mature size to move the index closer to one that reflects “efficiency”
- Determine appropriate weightings on fatness, given the desire by breeders not to make sheep leaner.
- Consider the appropriateness and value of including hard to measure traits like longevity, lamb survival and body condition score.
- Identify an appropriate weighting for abattoir derived carcass traits

Stage 2. Index development

2.2 Modelling sensitivity

- Consider further sensitivity to changing the weighting on:-
 - Restricting ewe mature size – both in terms of shearing and mature ewe weights
 - Lamb survival
 - Numbers reared
 - Lamb weight
 - Ewe longevity

2.3 Advanced index modelling

- Consider two index variants where more focus is required on specific traits and the trade-off between them:-
 - Carcase + where greater emphasis is placed on carcase traits
 - Parasite + where greater emphasis is placed on parasite traits

Stage 2. Index development

2.4 Review index weightings

- Compare index weightings with those previously used for Lleyn, BFL, the new hill index and index weightings used by Sheep Ireland.
- Consider the appropriateness of this index for crossing breeds, like the Bluefaced Leicester and Border Leicester

2.5 Assessing environmental impact

- Model the environmental impact of the proposed breeding index.
- Highlight appropriate index weightings for an environmentally focussed breeding index.
 - How different would these two indexes be at farm level? Assess the trade-off between these two approaches.

Stage 3. Industry engagement

Development of simple sub-indexes

3.1 Creation of simple sub-indexes

- Document how new, simply derived sub-indexes could be developed from a combination of existing EBVs to create more relatable customer focussed breeding tools.
- Comment on their relative value (or miss-use) in a breeding programme as breeding and marketing tools.
- Practical examples might include:-
 - lifetime number of lambs reared (longevity + litter size reared)
 - days to slaughter (carcase data + correlated growth traits)
 - kilogrammes of lamb reared per kilogramme of ewe (a common industry ratio trait taking into account mature size EBVs and lamb growth rate EBVs)
 - lamb value – index purely looking at offspring value (terminal sire index within a maternal breeding programme)
 - Parasite+ a very simple sub-index of FEC and IgA traits

Stage 3. Industry engagement

Development of simple sub-indexes



3.2 Stakeholder engagement with sub-indexes

- Convene a stakeholder group to discuss the use and promotion of sub-indexes
 - Discuss whether they should be expressed in real units of measurement, economic terms or simply as a star rating system to avoid confusion with existing EBVs and Indexes.

Summary

- Very ambitious project
 - **In terms of scope and timescale !**
- **Success of new traits will be influenced by the number of measurements provided at the start for :-**
 - Ewe mature size
 - Body condition score
 - Abattoir traits
- Grateful for CIEL and AHDB funding to move this forward

Please get
involved

