

Current and Future Developments in Irish Sheep Breeding

Nóirín McHugh

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

It is well established that approximately half of the production gains achieved in animal performance is attributable to genetic improvement. Genetic improvement is cumulative and permanent so that if you were to use animals with “good genes” then the effects of these “good” genes will remain in the flock. On the downside the reverse is also true, if an animal of low genetic merit is used within the flock then these “bad genes” are there to stay!

Sheep Ireland

The contribution of genetics to profitable farming can be witnessed first hand in both the dairy and beef sectors in Ireland. With this in mind Sheep Ireland was established in 2007 to initiate a dynamic breeding programme for the Irish sheep industry and increase flock productivity and profitability. In the past the true genetic merit of some pedigree animals may have been masked due to the intensive or selective management of these animals. The current genetic evaluations established by Sheep Ireland focuses on breeding animals for the commercial flocks. Part of the new breeding programme included the establishment of two recording initiatives, the central progeny test (**CPT**) and maternal lamb producer (**MALP**) groups. Within the CPT flocks pedigree ram from a diverse spread of recording flocks are mated to a central group of commercial ewes and the subsequent performance of all progeny are recorded in detail. The MALP flock’s involves the recording of data on progeny of sires that are used across a range of commercial farms and thus helps to identify ram of superior and inferior genetic merit across different production systems.

The aim of the national breeding programme is to produce a low cost, easy care sheep with good maternal characteristics, but yet will produce a quality lamb with high growth rates that will reach slaughter at a young age. Data on the traits of interest are recorded across a range of commercial and pedigree flocks and the weighting of each trait is dependent upon its relative economic importance to overall flock profitability. All economically important traits are then summed into three sub-indexes which in turn are summed into an overall breeding index. This index is the tool to help farmers in making more informed breeding decisions that can increase flock profitability

Sheep Value Index and sub-indexes

The overall Sheep Value Index is based on the Euro-star system which acts as an indicator of the profitability that can be obtained from the animal’s progeny. The Euro-stars are scored on a scale of

1 to 5 and compares all animals within each breed; a 1 star indicates that the animal lies within the bottom 20% of ranked animals for the given trait and a 5 star corresponds to the top 20% of animals.

Sheep Ireland ® Euro-Star Evaluation			
Tag Number	IE 1234567012345		
Date of Birth	01/01/2009		
	Euro-Value (€)	Acc (%)	Euro-Stars (Within Breed)
Sheep Value	€0.24	30	★ ★ ★ ★ ★
Sub-Indexes			
Production	€0.45	41	★ ★ ★ ★ ★
Maternal	-€0.23	42	★
Lambing	€0.02	12	★ ★ ★ ★ ★

Euro – Value
Shows extra profit expected from lambs sired by this Ram compared to an ‘average’ lamb.

Acc%:
Accuracy % shows how much confidence can be placed in the Indices i.e. Quantity & Quality of data behind indexes.
0 – 20% = Low
20-30% = Average
30-40% = High
40%+ = Very High

Euro – Stars
Shows where a sheep ranks within its own breed.



Summary of Sheep Ireland’s Euro-Star Evaluation

Sheep Value Index – this is the overall index for each animal and encompasses the three sub-indexes each weighted based on relative importance:

1. **Production Sub-index** – ranks animals based on their ability to produce good terminal progeny. This takes into account the progeny’s growth rate, carcass characteristics and days to slaughter.
2. **Maternal Sub-index** – ranks animals on the expected performance of their daughters and takes into account the daughters’ mothering ability, the ease of lambing, and the efficiently at which their progeny are finished.
3. **Lambing Sub-index** – ranks animals for lambing traits and takes into account the lambing ease and survivability of the animal’s lambs.

How to Use the Indexes

Prior to using any index, each farmer must determine the most suitable animal for their production system. The next question is how to achieve that ideal animal. For example, if farmers are interested in finishing all their lambs for slaughter then they should pay particular attention to the Production Sub-Index of the animal under consideration. On the other hand, if a farmer is looking to breed their own replacements then they should examine the Maternal Sub-Index carefully. Irrespective of the type of animal that is needed, careful attention should be placed on the star rating of the animal and the accuracy associated with the trait of interest. The higher the accuracy of the given trait the greater the information that is known about the animal and the greater the confidence producers can have that their published index value reflects their true index value.

Teagasc's Future Role in Sheep Breeding

Although a considerable amount of work has been undertaken in sheep genetics in Ireland, on-going research is required to further demonstrate the importance of sound breeding decisions on profitability. Key areas of research for Teagasc include development of breeding objectives and breeding programmes to continuously increase genetic gain in profitability across generations. Access to large quantities of accurately recorded data is one of the main obstacles to accurate genetic evaluations in Ireland and, therefore, resources and greater farmer cooperation are required to increase the level of recording especially for difficult to measure traits. Such traits include health traits (lameness, mastitis, susceptibility to parasites and fly strike), meat quality, lamb vigour and feed intake traits. However, in order to include such traits within the genetic evaluations tools must be developed for each trait to allow for accurate data to be recorded.

The key to a sustainable and a profitable industry is direction. Teagasc are committed to developing a bio-economic model which will model individual farm systems thereby evaluating the relative economic importance of individual traits within typical Irish sheep farms. Not alone will this model generate relative emphases for individual traits in the Sheep Value Index but it will also help to prioritise research in the areas that are likely to have the greatest impact sheep flock profit. Additionally, research will be undertaken where groups of animals segregated on genetic merit will be compared and their difference on profit compared to the expectation based on predicted genetic merit.

Genomic selection is a new tool which can increase the accuracy of identifying genetically elite animals. It is currently widely used within the Irish dairy population and will soon be implemented

in beef. Sheep can also benefit greatly from genomic selection, but the breeding objectives, genetic evaluations, breeding programmes and validation studies need to be first prioritised.



When buying a ram, make use of LambPlus information when it is available

Summary

In Ireland genetic evaluations' will become an important tool for sheep farmers in making more informed breeding decisions and has the potential to increase profitability at farm level. Teagasc will continue to work closely with the industry to further enhance sheep breeding and ensure that the benefits are clearly realised at farm level.