

Genetics v environment

The Euro-Star Index gives an overview of a beef animal's genetic potential on various key profit traits such as carcass weight, milk, etc.

The key word here is potential. A genetically elite animal will only thrive given the correct environmental conditions. Take the example of an animal with a high genetic merit for growth and muscle. If the animal is not managed correctly (feed, health, etc) then it will not perform to its potential, regardless of genetics. The Euro-Star Index removes all possible environmental effects and only expresses the genetic element of an animal's performance.

How does the Euro-Star Index remove environmental factors?

This is done through the power of numbers. The more performance records that you have on an animal, the more certain you can be as to how much of that performance is down to genetics. Collecting data from many different herds is also beneficial as it removes the possibility of environmental bias.

What is meant by environmental bias?

Compare a stock bull to an AI bull. Most stock bulls will only ever have a limited number of progeny born into a single herd. If, for example, management in this herd is very good, that stock bull will have a distinct advantage as his progeny's high phenotypic (physical) performance levels may be due to good management rather than good genetics. AI bulls, on the other hand, will have progeny born into many herds with many different production systems and management practises. Exposure to multiple environmental effects across many herds removes any environmental bias. Therefore, in the context of a genetic evaluation system, it is much easier to differentiate between what is genetic and what is environmental in the performance of a well-used AI bull as opposed to that of a stock bull.

How can I see this effect in the Euro-Star Index?

The reliability figures on traits will tell you how certain you can be as to the genetic component of an animal's performance. A bull with a

reliability of 99% for calving difficulty is fully proven. There will be a large number of progeny records in the evaluation and his calving difficulty figure will be purely based on his genetics. At 70% reliable, a bull could be deemed semi-proven. There will be some progeny records in the evaluation, but not enough to fully differentiate between the genetic and environmental effect on calving difficulty.

Reliability figures will increase much faster for AI bulls over stock bulls, as they will have much higher numbers of progeny born into many different herds. Reliability figures for cows will increase at an even slower rate as a cow will only produce a relatively small number of progeny in her lifetime.

Will reliabilities for all traits increase at the same rate?

No. It is easier to differentiate between the genetic and environmental effects for some traits than others. This is due to what is called heritability. Heritability is the difference in performance in a population of animals due solely to genetic effects.

Highly heritable traits such as polledness (animals born without horns) are solely affected by genetics and cannot be influenced by environment. Lowly heritable traits, such as calving interval, can be heavily influenced by environment and will require a much higher number of records to determine the genetic component.

Availability of data is also a critical factor. It is very difficult to measure any trait which is not being recorded routinely. An example of such a trait in the Euro-Star Index is milk. Milk performance in the suckler herd is measured through the weight gains of suckler calves. Less than 2% of suckler calves born in 2014 were weighed on farm. This shortage of data makes it very difficult to identify animals with a high genetic merit for milk within the suckler herd.

Happy Christmas

We would like to wish all our readers a Happy Christmas. We hope you have found this page helpful and informative. If you have any queries which haven't been dealt with here, please contact us. We look forward to your continued readership in 2016.



A pen of Donie's finishing bulls. In this environment where all animals are being fed the same diet, are housed in the same conditions and assuming there are no health issues, differences in performance can be attributed to genetic variation (heritability). The purpose of the Euro-Star Index is to highlight these genetic differences between animals.

Q&A

Q. If I use more than one stock bull in my herd will this help to increase reliability figures?

Yes. By using more than one stock bull the evaluation system can better quantify the genetic effect on performance. In most herds all animals receive the same treatment; therefore, if progeny from one bull are on average outperforming the other, this can be attributed to genetic differences (heritability). Using a stock bull(s) in conjunction with a number of AI bulls will allow for an even better comparison as the AI bulls will further nullify any potential environmental bias.

Q. What can I do on my farm to help to increase reliability figures on my stock?

The more data you record the more the reliability figures will increase. Accurate sire recording is the most critical piece of data as without a sire you cannot link a bull to its progeny.

FARMER FOCUS: DONIE AHERN

Difference in performance is due to genetics

Name: Donie & Paudie Aherne, Killeely, Co. Limerick

Farming System: Suckler to beef

4 and 5 Star Females: Cows: 52. **Heifers:** 62.

Stock Bull or AI: Stock Bull

Replacement Strategy: Breed my own and buy in.

Donie & Paudie Aherne run a 90-cow suckler herd in Killeely, Co. Limerick. They are participating in the Better Farm Programme. All progeny from the suckler herd are taken through to finish and extra bull weanlings are bought in to be finished as bulls. Donie tells us about his experiences of animal performance.

Tell me about your finishing system?

All homebred males and any females that aren't retained as replacements are slaughtered. We buy in extra bull weanlings and finish these alongside our own. All males are finished as bulls. We use very high DMD silage (75+), about 10-12 kg of a high energy ration and some straw to finish bulls. Heifers are slaughtered at 20 months on a similar diet, but with more silage and 6-8 kg of ration.

Would you notice big variations in performance levels?

Definitely. We weigh very regularly. The finishing animals are weighed as often as once a month to monitor weight gain and to try to predict slaughter dates and carcass weights. In the finishing bulls ADG's can vary from 1.3 kg to up to 2+kg



Donie Ahern

for the best performers. All animals are treated the same in terms of feeding, health and housing. The difference in performance is without doubt due to differences in genetics from animal to animal.

Do you find differences between the homebred and bought in animals?

We find that the range in performance would not be as big in the homebred stock. This is probably due to the homebred animals being sired by only 2 bulls. They are all treated the same from birth to slaughter which leads to more uniformity. The bought in animals are coming from many different herds with different management systems as well as different breeds and genetics, so we would see a much greater range in the performance of these animals.