BREEDPLAN Tips

Understanding Shear Force EBVs

Research has shown that meat tenderness is one of the most important factors influencing the level of consumer satisfaction from cooked beef products. More tender meat equals a more satisfying beef eating experience.

While meat tenderness is strongly influenced by non-genetic factors such as animal nutrition, pre and post slaughter treatment and cooking method, research has indicated that tenderness is also influenced by genetics, and can therefore be improved through selection.

Interpreting Shear Force EBVs

Shear Force EBVs are estimates of genetic differences between animals in meat tenderness. Shear Force EBVs are expressed as differences in the kilograms of shear force that are required to pull a mechanical blade through a piece of cooked meat.

Lower, more negative, Shear Force EBVs are more favourable. That is, lower EBVs indicate that less shear force is required and hence the meat is more tender. For example, a bull with an EBV of -0.90 would be expected to on average produce progeny with meat that required a shear force of 1 kg less than a bull with an EBV of +1.10.

Information used to calculate Shear Force EBVs

Shear Force EBVs are calculated from three different pieces of information.

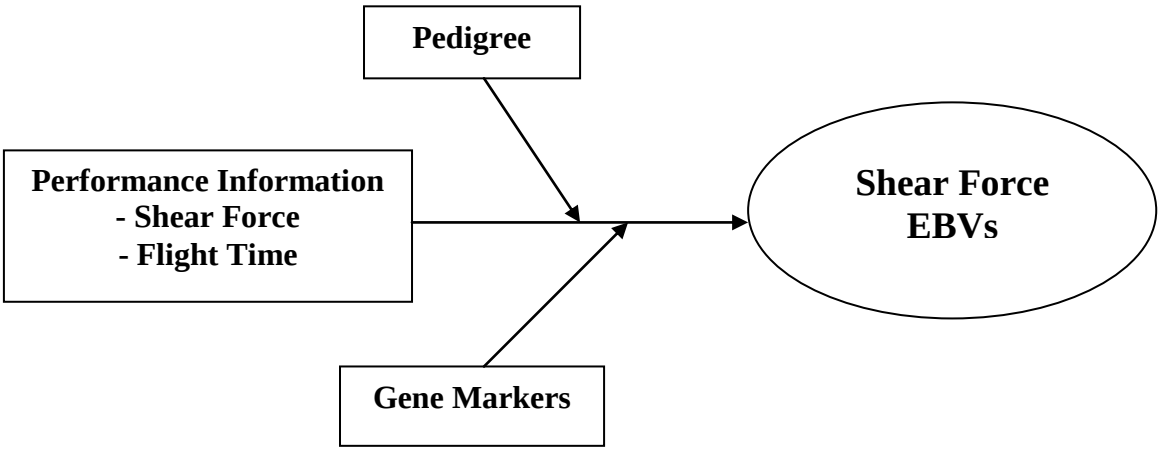
Gene Markers – Gene markers are sequences of DNA that are associated with individual genes that affect meat tenderness, tested from either a hair, semen or blood sample collected from an animal. Gene markers are included in the calculation of Trial Shear Force EBVs when independent industry validation (for such things as the frequency and phenotypic effect of the gene marker) has demonstrated that the gene marker is useful for genetic evaluation.

Flight Time – Flight time is the time taken for an animal to travel approximately 2.0 metres after exiting the crush, as measured by two light beams. While not a direct measure of tenderness, tropically adapted cattle with slower flight time (i.e. better temperament) have been shown to have more tender beef.

Shear Force – Shear force is an objective measure of meat tenderness. Meat samples are collected from the carcase of an animal and the amount of force required to pull a mechanical blade through the meat measured in a laboratory. This can be likened to how much force a person exerts when chewing a piece of steak. Meat samples with lower shear force (i.e. less resistance to mechanical blade) are more tender.

Note - If the above three pieces of information are all available for an animal (or its progeny), shear force will make the most significant contribution to the Shear Force EBVs as it is a direct measure of the sum effect of all genes affecting meat tenderness.

Figure 1 – Information used to calculate Shear Force EBVs



Selecting Animals with Shear Force EBVs

As Shear Force EBVs combine all the different information that is available, both measured performance and gene marker results, Shear Force EBVs provide beef producers with the best estimate currently available of an animal's genetics for tenderness. Through careful selection of breeding animals with Shear Force EBVs, beef producers have the ability to produce progeny with more tender beef.

When selecting animals using Shear Force EBVs, remember:

- Animals with **lower** Shear Force EBVs are more favourable.
- Selection for improved tenderness should be balanced with selection for other economically important traits.
- Always consider the accuracy of the Shear Force EBVs. It is important to remember that EBVs with low accuracy may change considerably with the addition of more information. However, remember the Shear Force EBVs take into consideration all the available information and therefore will be a more reliable indication of an animal's genetics than any of the component pieces of information (i.e. shear force measurements, flight time, gene markers for tenderness).
- The correlated effect of selecting animals with superior tenderness on other economically important traits (e.g. adaptability) has not yet been determined.

For more information regarding Shear Force EBVs, please contact staff at BREEDPLAN.