Selection Indexes – A General Introduction

What are Selection Indexes?

BREEDPLAN is now calculating Estimated Breeding Values (EBVs) for up to 18 different traits. While this provides cattle producers with a comprehensive range of information regarding the genetic merit of an animal, it can result in a dilemma when trying to select animals for use in a particular breeding program. In an ideal situation, it would be desirable to select animals that excel in all traits, but rarely will an animal be superior in all 18 traits. So which traits should producers put most emphasis on? How much emphasis should be placed on each trait?

BreedObject is a tool that can help solve this dilemma. BreedObject combines the BREEDPLAN EBVs for an animal with an economic weighting (based on costs of production and returns on outputs), to produce a single Selection Index. A separate Selection Index can be produced for any particular production scenario and market.

Selection Indexes enable cattle producers to make "balanced" selection decisions, taking into account the relevant growth, carcase & fertility attributes of each animal to identify the animal that is most profitable for their particular commercial enterprise. Selection Indexes reflect both the short term profit generated by a sire through the sale of his progeny, and the longer term profit generated by his daughters in a self replacing cow herd.

What Selection Indexes are available?

Standard Selection Indexes are now available for most Breed Society/Associations. The standard breed specific Selection Indexes have been designed to cater for the commercial market production systems of general relevance in each particular breed. These Selection Indexes are intended for use by both seedstock & commercial producers.

A general description of the different Selection Indexes that are available for each particular breed are available via the relevant Breed Society/Association website or by contacting staff at BREEDPLAN. Also available should be information regarding the relative emphasis that is being placed on each EBV in the calculation of the different Selection Indexes. This information is also available via the "EBVs Explained" link within the EBV enquiry facility for Breed Societies/Associations that are offering this service.

As well as standard Selection Indexes, it is also possible to develop customised indexes for individual producers using herd-specific production information and marketing goals. Further information regarding the development of customised indexes can be found on the BreedObject website (www.breedobject.com).

Interpreting Selection Indexes

The Selection Index value for an animal is effectively an EBV of the animal's profitability in that particular commercial production scenario and market. Ranking seedstock animals on their Selection Index value sorts them based on their progeny's expected profitability for the targeted production system.

Selection Indexes are expressed as "net profit per cow mated". For example, if we compare a bull with an Index of +$60 with a bull that has an Index of +$30, we can estimate that the difference in net profit from the progeny of the bulls would be :

$$= ½ \text{ x difference in Index}$$
$$= ½ \text{ x } (60-30)$$
$$= \$15 \text{ per cow mated}$$

(nb. We need to multiply by ½ because only half the progeny's genes come from the sire)

If the two bulls were joined to 200 cows during their breeding life, this would equate to a difference of (200 x $15) = $3000.

It is important to note that this difference includes profit across the entire production chain from joining to slaughter and also considers the long term profit generated by a sire's daughters (if a self replacing Selection Index).

Using Selection Indexes

As a guide to using Selection Indexes, it is recommended that producers complete the following steps:
  - (i)   Identify the Selection Index of most relevance
  - (ii)   Rank animals on the Selection Index
  - (iii) Consider the individual EBVs of importance
  - (iv)   Consider other traits of importance

More detailed information regarding each of these steps is included in the Tip Sheet titled "Selecting Animals with Selection Indexes".

For more information regarding Selection Indexes, please contact staff at BREEDPLAN.