

# Selection VALUES

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Beef cattle breeders sometimes find it difficult to know which individuals would be 'best' to become the parents of the next generation. Selection involves the evaluation of potential parents on functional efficiency as well as many production traits, and some compromises among these traits are also needed.

**S**election in beef cattle on single traits is not advisable due to negative correlations between traits. For example, if cattle are selected only on weaning weight, chances are very good that cattle will become larger and birth weights become heavier, which might lead to difficult births. The solution to this problem is multitrait selection – by selecting bulls that breed calves that wean heavy calves but which are not too heavy at birth. This is a simple example, but in practice, things could get much more complicated: heavy weaners are also dependant on cows with high milk production, etc.

One of the methods used to simplify selection and select for multiple traits at once is to use a selection value, which combines breeding values of different traits into a single value. However, breeding values can not be simply added together: some traits are economically more important and

heritabilities of traits differ. Each trait is therefore scientifically weighed. Selection values take the advantages and disadvantages of traits into consideration in a balanced way. In addition to selection on production traits by using selection values, animals should also be visually inspected for functional efficiency traits like structural soundness and disposition.

## **Breeding the perfect cow**

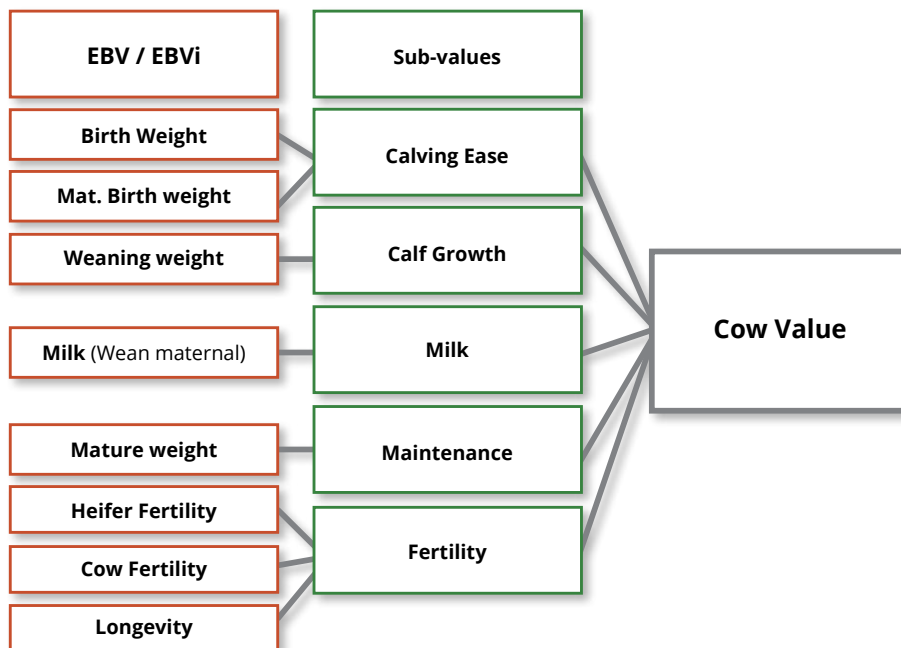
What are the characteristics of a perfect cow? She is fertile, calves easily and regularly, weans a heavy, strong and healthy calf, while she has enough milk to sustain its growth. Her own body weight is in balance in relation to the weight of her calf, thereby ensuring a lower maintenance requirement and a more efficient animal. The Cow Value combines the weighted breeding values of these traits in a single value. However, in order to see the various strengths and weaknesses of an animal, the Cow Value (CV) is made up of the sub-values Calving

Ease, Calf Growth, Milk, Female Fertility and Maintenance. Sub-values combine similar breeding values in a scientific manner to simplify the selection of animals. For example, the EBVs for Heifer Fertility, Cow Fertility and Longevity are combined to form the sub-value Fertility by taking the heritability and economic importance in consideration. By using the sub-values, it is also easier to identify specialist bulls, for example a heifer bull (minimizing calving difficulty in first-calf heifers), maternal bulls (daughters will raise a profitable calf every year) or a terminal bull (sire heavy weaners). It is therefore essential to evaluate the sub-values for the Cow Value when selecting potential breeding bulls. The weights placed on the different traits differ between breeds, and each breed has its own customized Cow Value, as there is not a "one size fits all" Cow Value that will fit all breeds.

**Figure 1** summarises the components of the Cow Value. The Cow Value and various sub-values are expressed in an index format, thus an animal with a sub-value of 110 for Fertility will genetically be above average compared to the live animals in the breed. The 'ideal' animal will theoretically have the highest possible positive values for all sub-values. Sub-values are scaled to indicate that above 100 values are generally in the more desirable direction, for example a smaller calf at birth is more desirable and therefore has a higher calving ease value, and a smaller cow is more efficient and therefore also has a higher maintenance value. Both these traits however are optimal when average - so extremely high is also not beneficial, but this is counteracted in the cow value by the requirement of high calf growth.

**CONCLUSION**

By using selection values, breeders can successfully select for multiple traits at the same time. It provides a systematic means for making selection decisions that are consistent with improved profitability.



**FIGURE 1:** Components of the Cow Value

**FIGURE 2:** Relative weights on breeding values and sub-values of the Boran Cow Value

