SA STAMBOEK STUD BOOK

LOGIX Selection Values: SELECTION MADE EASY

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INTRODUCTION

The most profitable beef cattle herds consist of low-maintenance cows that calve every year and produce healthy calves that grow fast and efficiently. Breeding values are an additional source of information for breeders wishing to genetically improve their animals, and take the guesswork out of animal selection. Breeding value estimation uses prior knowledge of the performance of the animal as well as its family members to predict the most likely performance of progeny.

Selection should not be based on one trait only, as traits are genetically connected. Selecting only for maximum weaning weight for example, will increase both birth weight and mature weight. The result will most likely be an increase in difficult births, and larger, inefficient cows. Even selecting only on fertility could favour cows that fail to wean their calves or tend to wean poor calves, as these cows appear to be more fertile. Selection for fertility should therefore be a fertile cow that weans an acceptable calf every year. Logix selection values are a combination of relevant breeding values weighted according to economic and genetic parameters. The Logix Cow Value, for example, is a combination of 5 different selection values and 8 different breeding values.

INTERPRETATION OF BREEDING VALUE INDICES (EBVI) AND SELECTION VALUES (SV)

Commercial farmers that want to buy a stud bull, as well as some stud breeders, find the interpretation of breeding values (EBVs) challenging. Logix Breeding Values are therefore also presented as

Breeding Value Indices (EBVi) which are much easier to interpret.

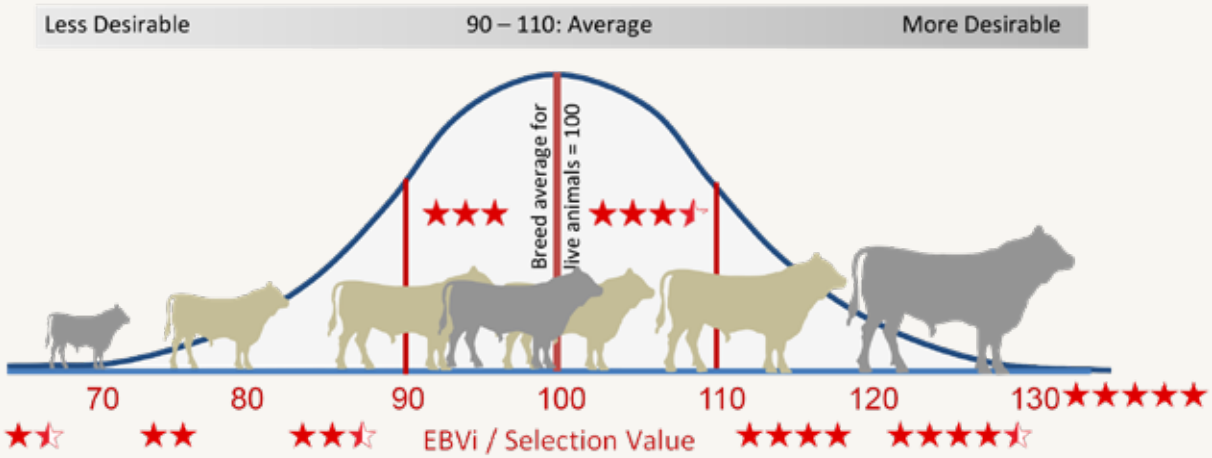

Figure 1: Breeding value indices and LOGIX selection values are expressed as indices for easy interpretation: Roughly half the animals in the breed will have values between 90 and 110 and higher values are always in the more desirable direction. Stars are also awarded according to selection values.

The average breeding value index (EBVi) of the live animals in the breed is set to 100 for each trait. Roughly 50% of the animals will have breeding value indices between 90 and 110, as EBVi's are standardized. These are average animals and represent the breed.

A higher index (above 100) is in the more desirable direction, and is interpreted as follows:

- Lower Birth Weight and Birth Maternal (lower chance of birth difficulties and therefore more desirable)
- Higher Weaning Weight and Wean maternal (heavier weaner calf)
- Heavier at Post-wean (12 & 18 months) and Mature Weight (larger cattle, although intermediate may be more desirable)
- Higher Heifer Fertility, Cow Fertility and Longevity
- Higher Growth Test and Carcass EBVs.

Note that all breeding value indices should not be maximum. For some traits, e.g., birth weight, mature weight and even wean maternal, the optimum may lie between 90 and 110 for some or most herds.

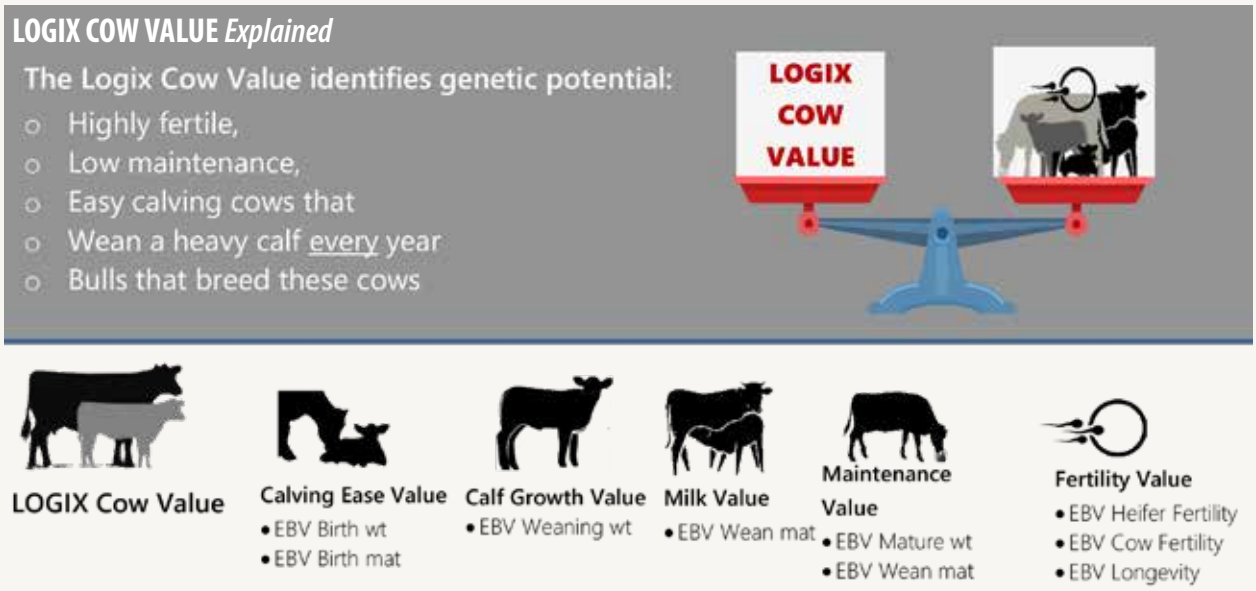

Figure 2: Breeding values are combined into several selection values, which are combined into the Logix Cow Value. Animals should be evaluated on all selection values, and not only on the Logix Cow Value.

The Calving Ease Value indicates a lower birth weight, and therefore a lower risk of calving difficulty. It is a scientific combination of birth and maternal birth weight breeding values. This selection value is especially important when choosing bulls to use on heifers. It should, however, also be always evaluated in combination with the calf growth value, as a smaller calf at birth tends to be small at weaning as well. Select a higher Calving Ease Value (smaller calf at birth), and a higher Calf Growth Value (heavier calf at weaning).

A calf's weaning weight is genetically determined by Weaning weight (the calf's genetic ability to grow) and Wean Maternal, which is the dam's ability to care for and nourish her calf (milk & mothering ability). The Calf Growth Value is the same as the Weaning weight EBV, while the Wean Maternal EBV is the same as the Milk Value. Select intermediate to higher breeding values and avoid extremes. As a rule of thumb, the Wean Maternal EBV should be in the same range as the Weaning weight EBV.

It has been shown that large heavy cows need more feed and thus have a higher maintenance requirement than small light cows. High milk production is also an energy drain on cows and has been shown to increase maintenance. The Maintenance Value is therefore a scientific combination of the Mature Weight and Wean Maternal breeding values, where a larger Maintenance Value (>100) indicates a lighter cow, and a smaller Maintenance Value (<100) indicates a heavier cow with higher maintenance than the average cow in the breed. In general, average cows with maintenance values between 90 and 110 are suitable for most South African conditions due to lower maintenance energy requirements, which leaves more energy for production and fertility. However, large cows do best if good quality cheap feed is available, as large calves can be sold at a better price and input costs are lower. Mature weight breeding values are estimated from cow weight at weaning of the first 3 calves.

The Fertility Value is a scientific and economic combination of the Heifer Fertility, Cow Fertility and Longevity breeding values. The Heifer Fertility breeding value is estimated with the age at calving measurements of heifers within contemporary groups. The first three calving intervals (ICP) within contemporary groups are used for the estimation of Cow Fertility breeding values. Longevity is the herd life of the animal and its family up to 10 years of age.

SELECTION GOALS

Different types of bulls are suitable for different types of cows and circumstances. Below are two examples of using Selection Values to easily select a bull that will breed profitable calves in two diverse environments. As inbreeding should also be kept at a minimum, an easy-to-use mating program, eg. SABeefBulls.com, can be used to find the best bull and cow combinations according to specific selection goals while keeping inbreeding to a minimum.

Table 1: Optimum Selection Values may differ between environments.

Selection Value	Extensive Environment (Average growth)		Good Environment (High growth)	
Calving Ease Value	**Average** birth weight	90-110	Birth weights may be higher due to higher wean weights	>80
Calf Growth Value	**Average** wean weight	90-110	**Heavy Wean weight**	**>110**
Milk Value	**Average** milk	90-110	Average to high milk	>90
Maintenance Value	**Average** cow weight	90-110	Cows may be heavier due to the superior environment	>80
Fertility Value	High fertility	>90	High Fertility	>90
Cow Value	Average to high	>90	Average to high	>90

CONCLUSION

It is advantageous to use selection values because animals are selected on their total genetic profitability, and not on single traits. Commercial farmers wanting to buy performance recorded animals, also find Logix selection values very easy to use and interpret. One can easily spot an animal's strengths and weaknesses and good traits compensate for some less favourable traits.