



TechTalk

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Improving Beef Cattle Fertility with Genetics.

Reproductive performance is a key determinant of profitability in a beef cattle enterprise. Consequently, selection for improved female fertility should be an important consideration for all beef cattle producers.

More calves from a set number of breeders over a defined period (12 months) equals more dollars, with the job of a female in a beef producing herd to conceive, preferably as early in the joining period as possible, carry a foetus during gestation, deliver a live calf and raise it until weaning, within every 12 month period of her breeding life. A female that does not do this is failing to do her job and eroding herd profitability.

While many producers manage the reproductive performance of their female herd using different management strategies, in particular the culling of females that fail to get in calf, research has shown that female fertility is influenced by the genetics of the breeding herd.

The next bull you purchase is one factor that will impact on the fertility of your breeder herd. This will arise from keeping a selection of his daughters to enter the breeding herd (i.e. Self replacing herd).

The question to ask yourself is “how do I know that the bull(s) I am selecting will have the genetic package to produce very fertile daughters?”

There are currently two pieces of information that can be used as a guide to

selecting bulls with “good” fertility genetics. These being genetic differences (BREEDPLAN Estimated Breeding Values) for Scrotal Size (SS) and Days to Calving (DC).

Scrotal Size

Scrotal Size (SS) EBVs are estimates of the genetic differences between animals in scrotal circumference (cm) at 400 days of age.

Scrotal size is measured by BREEDPLAN members from behind the animal (Figure 1). The scrotum containing both descended testes is measured using a tape positioned where scrotal circumference is greatest. At the same time, the scrotum can be palpated to detect abnormalities.

Increased SS is associated with increased semen production in bulls, and earlier age at puberty of bull and heifer progeny. SS also has a small favourable relationship with Days to Calving (DC), such that bulls with larger SS tend to have daughters with shorter DC.



Figure 1. Measuring Scrotal Size.



TechTalk

April 2016



Larger, more positive, SS EBVs are generally more favourable. For example, a bull with an SS EBV of +1.7 cm would be expected to produce sons with larger testicles at yearling age and daughters that reach puberty earlier than the progeny of a bull with an SS EBV of +0.4 cm.

A raw SS (e.g. 36cm) and SS EBV (+1.7 cm) on sale bulls should not be confused as they explain slightly different attributes. A raw SS should be used to indicate if a bull has a higher probability of being fertile himself (i.e. is able to get his share of cows in calf). Bulls selected for high SS EBVs are expected on average to breed daughters with earlier puberty and with shorter days to calving.

Days to Calving

Days to Calving (DC) EBVs are estimates of genetic differences between animals in female fertility, expressed as the number of days from the start of the joining period (i.e. when the female is introduced to a bull) until subsequent calving (Figure 2).

DC promotes those cows that calve earlier in the season compared to those that calve later, while penalising those cows that do not calve. Negative DC EBVs indicate a shorter interval from the start of joining season until calving.

Variation in DC is mainly due to differences in the time taken for females to conceive after the commencement of the joining period (Figure 2). Females with shorter DC EBVs tend to be those which also show early puberty as heifers, which

return to oestrous earlier after calving and conceive early in the joining period.

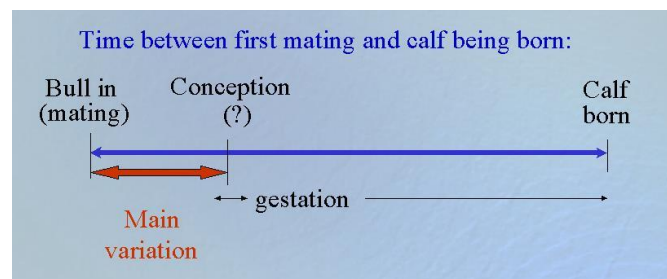


Figure 2. Measure of Days to Calving

DC EBVs are reported in days and will generally have low accuracies until a sire has a large number of daughters with days to calving records.

Lower or negative DC EBVs are generally more favourable and indicate sires that will produce daughters with shorter number of days to calving and this effect will be cumulative over the life of those daughters. For example, a bull with a DC EBV of -10 days would be expected to produce daughters that conceive earlier in the joining period than the daughters of a bull with a DC EBV of +10 days.

Note that there is only a small favourable relationship between SS and DC. Therefore it is strongly recommended that you select for the DC trait directly if you want to improve female fertility.

Conclusion.

Progress can be made in fertility by selecting bulls that have the right genetic package. Indicators of bulls with a good



TechTalk

April 2016



fertility genetic package are those with an above average SS EBV and below average (negative) DC EBV.

You may notice is some sale catalogues that have weight EBVs available for selection do not have fertility EBVs available (e.g. SS & DC). We encourage all BREEDPLAN members to record these fertility traits, submit for analyses and have EBVs available for their own selection and for their clients.

Commercial bull buyers should ask for this information on the bulls they will be potentially purchasing and taking home.

Other EBVs (weight, carcass), visual appraisal, Bull Breeding Soundness Evaluation (BBSE) of which the components are

- Scrotal circumference (cm) and tone or resilience
- Physical examination for faults in the head, legs, joints, feet, sheath and penis
- Semen analysis for motility,
- Morphology (or structure of the individual sperm cells), and
- Mating behaviour / mating ability.



should also be included in your bull buying decisions.

For further information regarding breeding for improving fertility please contact staff at SBTS or TBTS