



ACV Release Revised Minimum Scrotal Circumference Standards

The Australian Cattle Veterinarians (ACV) released revised standards for minimum scrotal circumference to pass a Veterinary Bull Breeding Soundness Evaluation (VBBSE) during 2013.

The revised standards have resulted from recent advances in understanding as to what constitutes normal scrotal size in the Australian herd based on the "Bull Power" project. This project involved analysis of ~260,000 scrotal circumference measurements that had been recorded with BREEDPLAN between 2000 and 2012 across 13 common breeds of Australian beef bulls, including Angus. Scrotal circumference measurements were mostly taken when bulls were within 250–750 kg live weight and 300–750 days of age.

Why Measure Scrotal Circumference?

Measuring scrotal circumference can indicate the likelihood that a bull has reached puberty, and whether testicular development is within the normal range. Scrotal circumference assessment is an important part of a VBBSE, which is used to assess whether bulls have normal reproductive function prior to making selection and management decisions.

Scrotal circumference is:

- A good indicator of daily sperm production especially in young bulls, which is fairly constant per gram of testis
- A highly repeatable measure (with appropriate technique) and highly heritable (30-45%)
- Correlated with sperm motility and morphology. However, these are independently assessed as part of a routine VBBSE
- Genetically correlated with earlier age at puberty in female relatives
- Genetically correlated with earlier return to cyclicity after calving in female relatives within tropically adapted cattle, and especially *Bos indicus* cattle

VBBSE Standards for Scrotal Circumference

Previous VBBSE standards listed simple minimum cut-off points for scrotal circumference based on breed and age. Historically, bulls with a scrotal

circumference greater than the cut off were scored with a tick for the scrotal circumference component of the VBBSE, and those below with a cross.

In recent times, the VBBSE has moved from a pass/fail model to a description of risk with a T (Tick), Q (Qualified) and X (Cross) system being used to acknowledge that there are shades of grey and that assessment of risk is not always absolute.

Findings from Bull Power Project

The main findings from the recent analyses include:

- Live weight appears to be a superior reference point in comparison to age as a measure for assessing acceptable scrotal circumference in young bulls. Age can also be used, but the variation at any age is higher because of nutrition effects on weight per day of age.
- Scrotal circumference x weight relationships have the same pattern in most breeds. The range across breeds of average scrotal circumference at any weight between 250-750 kg is 5-7 cm. Temperate breeds tend to have larger scrotal circumference at the same weight than tropically-adapted breeds; some of this is related to the lower width to length ratio of *Bos indicus* testes.
- Across the 13 breeds included in the study, Australian beef bulls have been categorised into 5 groups that, at the same live weight, have similar average scrotal circumference. Angus bulls have been grouped as having very similar live weight x scrotal size relationships to Simmental and Murray Grey bulls.

Recommendations

There is no clear point at which a scrotal circumference indicates an increased risk to fertility. Thus, scrotal circumference needs to be interpreted along with other elements of the physical examination, and with crush side semen and morphology results if available. Bulls with a scrotal circumference that is not within "normal limits" should be viewed with suspicion unless it can be shown by other means that this does not pose a risk.

Details of normal scrotal circumference in the Australian Angus bull population are provided in Figure 1 (below). As a general principle, it is recommended that the minimum acceptable scrotal circumference is the bottom 5% value at any weight.

It should be noted that the minimum recommended is “bare minimum”. For example, bulls close to the minimum threshold are more likely to suffer from some of the problems associated with small scrotal circumference than bulls well above the threshold. Bull breeders may consider setting a higher scrotal circumference minimum for sale bulls than what is indicated by normal range.

Table 1 shows the data from Figure 1 in tabular form and provides a ready reckoner to the minimum acceptable scrotal circumference at a given live weight in Angus bulls:

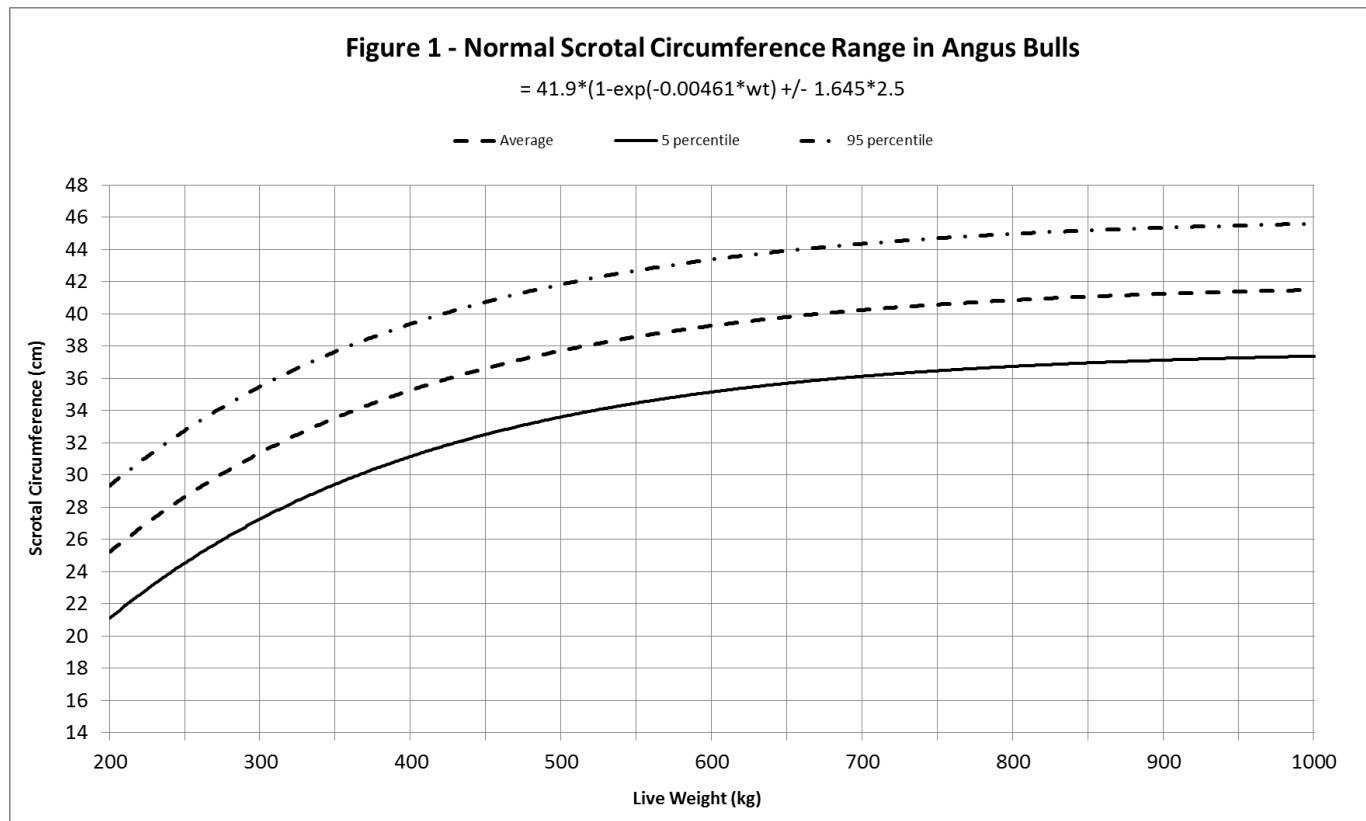
Acknowledging that it is not always possible to obtain live weights for bulls, Table 2 provides recommended minimum scrotal circumference thresholds for Angus bulls in situations where live weight is not available. Again, these are the “bare minimum”.

These standards do not indicate that either puberty

Table 1 – Minimum Acceptable Scrotal Circumference by Live Weight in Angus Bulls	
300 kg	27.5 cm
400 kg	31.0 cm
500 kg	33.5 cm
600 kg	35.0 cm
700 kg	36.0 cm
800 kg	36.5 cm
900 kg	37.0 cm

Table 2 – Minimum Acceptable Scrotal Circumference by Age in Angus Bulls (Where Live Weight is Unavailable)	
12 months	24 cm
15 months	28 cm
18 months	30 cm
21 months	32 cm
24 months	34 cm
27 months	35 cm

or sexual maturity has been reached; rather, they indicate normal minimum levels of testicular development as reflected in scrotal circumference. Separate evaluation of crush-side semen and or sperm morphology are required to confirm attainment of puberty and sexual maturity, with most bulls reaching puberty in a narrow range of 27 – 30 cm.



Reference:

Australian Cattle Veterinarians, *Veterinary Bull Breeding Soundness Evaluation*, 2013