



# Repro Tracks

► by **Bill Beal**, Virginia Tech

## How to use scrotal circumference

*Scrotal circumference (SC) is an important indicator of a bull's sperm production. Actual SC measurements are a valuable part of prebreeding examinations, and adjusted 365-day SC is used in the Angus genetic evaluation to calculate the SC expected progeny difference (EPD). Actual SC should be used to predict the likelihood a bull will be a successful breeder. However, SC EPD is the best estimate of the bull's genetic potential.*

### Introduction

SC measurements are the best indicator of a bull's daily sperm production. They are used in the Angus genetic evaluation and to determine a bull's breeding soundness. The measurement of SC should be taken at the largest diameter of the scrotum. A flexible measuring tape should be placed snugly around the scrotum after both testicles have been positioned beside one another. The scrotal measurement is recorded in centimeters (cm).

Scrotal circumference recorded at the time of yearling data collection (320-440 days of age) is important data for Angus Herd Improvement Records (AHIR®) and for use in the Angus genetic evaluation. Scrotal measurements are adjusted to 365 days of age for entry into the genetic evaluation.

The circumference of the scrotum is also measured shortly prior to use of a bull for mating as part of a breeding soundness exam (sometimes referred to as a BSE). The actual scrotal measurement, rather than an adjusted value, is used to predict the bull's breeding soundness. To pass the exam, the SC measurement must surpass a minimum standard that is based on age, as depicted in Table 1.

**Table 1: Minimum recommended scrotal circumference by age**

Age of bull	Minimum SC, cm
15 months or younger	30
15-18 months	31
18-21 months	32
21-24 months	33
Older than 24 months	34

**Source:** Society for Theriogenology/American College of Theriogenologists. 1993.

### Breeder question No. 1

*At a recent bull sale I noticed a 14-month-old bull listed in the sale book with a SC of*

*29.8 cm. How could this bull have passed the breeding soundness exam?*

**Response:** I contacted the breeder to get an answer to this question. It turns out this bull's yearling measurements and his breeding soundness exam were performed on the same day, Oct. 15. At that time, the bull was 434 days of age. The actual scrotal measurement recorded that day was 32 cm, more than enough to pass the exam. After the raw scrotal measurement was turned into AHIR, the SC was adjusted to a 365-days-of-age basis.

Because the bull was over a year of age when the scrotal circumference was measured, the adjusted value was less than the actual scrotal circumference. In fact, this bull "lost" 2.2 cm (69 days × 0.032 cm per day). The breeder chose to report the adjusted SC, 29.8 cm, in the sale book, and this is what led you to question the bull's breeding soundness.

If possible, it is probably more beneficial to put actual SC measurements recorded at the time of the breeding soundness exam (one to three months prior to a sale) in a sale book rather than to report the 365-day adjusted SC. The actual SC recorded during the prebreeding examination is the best indicator of the bull's sperm-producing potential at the time and should be the guide to determining the likelihood the bull will be a successful breeder. Conversely, the adjusted SC is a valuable data point for the genetic evaluation of the bull, but after it is included in the calculation of the SC EPD, the EPD becomes the best estimate of the bull's genetic potential to pass on desirable genes for testicular development to his sons.

After having this discussion with the breeder whose sale books in the past have reported the adjusted SC, he has chosen to report the actual SC in his future sale books.

### Breeder question No. 2

*When I select bulls, I place a lot of significance on testicle size. Normally, I choose bulls with an SC equal to or greater than 38 cm. Should I be able to turn these bulls out with more cows than if I purchased bulls with smaller testicles?*

**Response:** Differences in SC reflect differences in the daily sperm production potential of bulls. However, the breeding capacities of bulls depend on more than just their sperm production. Libido, athleticism, soundness and environmental factors all play

a role in determining the appropriate bull-to-female ratio in a breeding pasture.

The use of SC in a breeding soundness exam is considered as a "threshold." If the bull being examined surpasses the SC standard set for his age group (see Table 1), he is classified as "satisfactory" for that

portion of the exam. The breeding soundness exam does not attempt to predict differences in breeding capacity among bulls.

While neither the breeding soundness exam nor SC are recommended as tools for determining differences in the bull-to-female ratio in a breeding pasture, there is compelling evidence that indicates differences in SC are correlated with differences in pregnancy rate at the end of the breeding season. In a huge study involving 205 herds, 100 veterinary clinics and more than 2,990 bulls examined before the breeding season, researchers found that cows exposed to bulls with smaller SC were less likely to be diagnosed pregnant and had a longer interval to rebreeding than cows mated to bulls with a larger SC. Based on your selection of bulls with a large SC, these data should be encouraging to you.

### Breeder question No. 3

*Will the use of genomic testing make the measurement of SC less valuable or unnecessary?*

**Response:** The Pfizer 50K genomic test has proven to be a remarkable tool for the estimation of the genetic potential for SC. In a recent report on genomic-enhanced EPDs ([www.angus.org/agi/GenomicUpdateJan2013.pdf](http://www.angus.org/agi/GenomicUpdateJan2013.pdf)), the genetic

**The breeding soundness exam does not attempt to predict differences in breeding capacity among bulls.**

## REPRO TRACKS

correlation between genomic results and actual SC measurements was the highest (.73) among all the traits estimated by the Pfizer 50K. This means the use of the genomic test can be used to generate higher accuracies for SC EPDs, especially on young animals or animals with no SC data.

Even though the genomic test enhances the genetic prediction for SC EPD, it does not substitute for a measure of a bull's testicular size when he is being examined prior to the breeding season. Therefore, the results of the genomic tests are not likely to replace

the measurement of scrotal circumference. However, the use of genomic testing will enhance the accuracy of the genetic prediction for SC and allow higher accuracies to be achieved when calculating SC EPDs of heifers or of bulls that are too young for measurement of SC.



**EMAIL:** [wbeal@vt.edu](mailto:wbeal@vt.edu)

**Editor's Note:** *Bill Beal is a beef cattle reproductive physiologist and professor emeritus at Virginia Tech. He conducts research involving estrous synchronization, artificial insemination, embryo transfer and the use of ultrasound technology. This column is designed to provide answers to questions about reproductive management commonly posed by commercial and purebred breeders. If you have questions or comments related to the reproductive management of cows or bulls, email them to Beal at [wbeal@vt.edu](mailto:wbeal@vt.edu).*