



THE PERFORMANCE LINK

by JOHN CROUCH, *director of performance programs, American Angus Association*

Let's talk scrotal circumference

Once upon a time in the evolution of performance there was a measured value called average daily gain (ADG). It was a simple value derived from a complex mathematical formula: divide the weight of an animal by its age in days.

The next step in the process was to compare animals with respect to ADG, and a simple ratio system was devised with 100 representing the average value of the group. With normal genetic variation as exists in any species developed under natural conditions, one-half of the group falls in the below-average category and one-half is above average.

Hence, the controversy began.

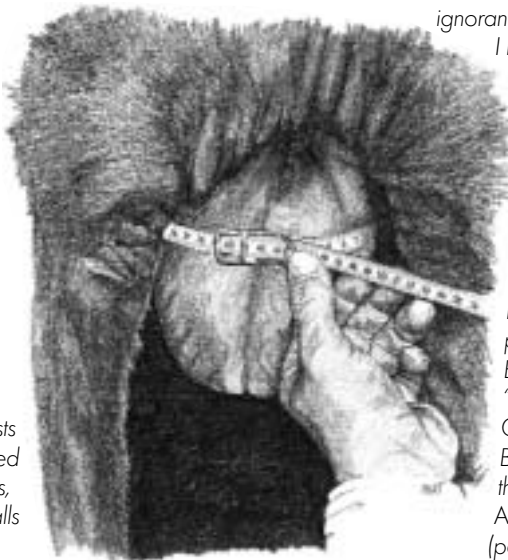
I recently heard an "experienced cow

person" advise another, "Don't buy a bull with a negative scrotal EPD (expected progeny difference) because his daughters won't breed." This is the most preposterous, ignorant, untrue statement I have ever heard.

Let us examine the facts.

Scrotal circumference indicates fertility in a bull and age of puberty in his daughters. For further details, please refer to Bill Beal's article, "The Scrotal Circumference Bandwagon" in the August 1997 Angus Journal (page 144). If you need an extra copy,

call me, and I'll send one. Before I do that, however, allow me to quote some passages from the article.



Simply put, bulls with larger testicles sire daughters that reach puberty (begin cycling) earlier. However, this facet of selection for larger scrotal circumference is of secondary importance for two reasons:

1. The magnitude of this effect is small.
2. A relationship between scrotal circumference and daughters' age at puberty cannot be misconstrued to be a direct indicator of the daughters' potential fertility.

And ...

The most often quoted data relating scrotal circumference of the bull and reproductive traits of his daughters indicates that for each centimeter larger a bull's scrotal circumference:

1. His daughters may reach puberty 0.8 days earlier.
2. His daughters are more likely to calve for the first time 0.8 days earlier.
3. His daughters' calf weaning weights are likely to be 0.75 pounds heavier.

Scrotal circumference is a threshold trait. In other words there is a threshold or an area for a range of goodness. It is generally

thought that a minimum threshold scrotal measurement in the Angus breed is 30 centimeters (cm). Yearling bulls with testicles less than 30 cm should not be used as seedstock.

The average scrotal measurement in the Angus breed is just larger than 36 cm, which is excellent. With an average of 36 cm, normal genetic variation will place one-half of the breed smaller than 36 cm and one-half of the breed larger than 36 cm. This variation is explained by a term called standard deviation, which describes the normal variation in a given trait in any large group of living things.

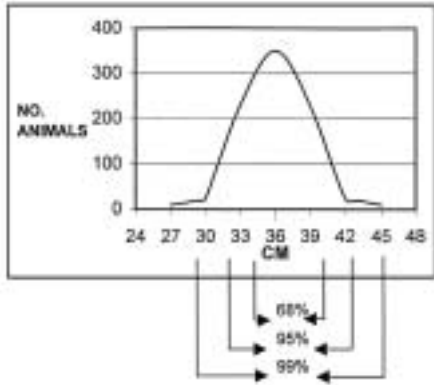
Research beginning with Gregor Mendel in the 1860s revealed that certain portions of any population have normal, or standard, deviations from the average. In a group of 1,000 yearling bulls, for example, the standard deviation for scrotal circumference is ± 3 cm. The accompanying tables and charts apply.

Assuming yearling Angus bulls measuring 30 cm and larger are adequate, with an average of 36 cm in the group, roughly 0.05% of the bulls would need to be culled

Table 1: Scrotal Circumference, by Standard Deviation (SD)

Group average = 36 cm
 One SD = ± 3 cm (33-39 cm)
 Two SD = ± 6 cm (30-42 cm)
 Three SD = ± 9 cm (27-45 cm)

Chart 1: Normal Distribution Curve, with 36-cm Average



because they fall below the threshold level of 30 cm. As the younger generation would say . . . no problem!

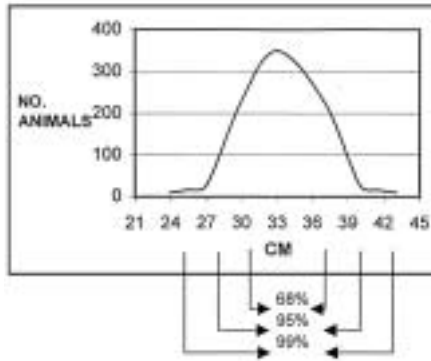
Let's create a hypothetical situation and assume we have another group of 1,000 yearling bulls with an average scrotal circumference of 33 cm.

Again assuming that yearling Angus bulls measuring 30 cm and larger are adequate, with an average of 33 cm, roughly 16% would fall below 30 cm and should not be returned for seedstock. This then becomes a problem.

Table 2: Normal Distribution for Scrotal Circumference

680 or 68% of the Angus breed is between 33 and 39 cm
 950 or 95% of the Angus breed is between 30 and 42 cm
 990 or 99% of the Angus breed is between 27 and 45 cm

Chart 2: Normal Distribution Curve, with 33-cm Average



The Angus breed has excellent genetics for fertility and reproduction. The average scrotal circumference EPD for current sires is +0.02 with one standard deviation being ± 0.27 . This means that the normal range of EPD from -0.25 to +0.29 is very desirable. If a problem exists, it is easily corrected through proper sire selection.

