



# **Bull Power: Examination of Beef Cattle Bulls for Breeding Soundness**

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The evaluation of bulls for breeding soundness is an effective and reliable way to identify bulls that are potentially poor breeders. This management technique can be used to greatest advantage if culling occurs before bulls are turned out with females. Also, the evaluation is an important means available to the producer for predicting bulls with satisfactory to excellent potential. This information can then be used to select superior bulls for a larger number of females, which thereby improves the efficiency of production. A breeding soundness evaluation (BSE) provides an opportunity to select against low fertility as well as to improve fertility in both males and females. It has been shown that bulls with large testicles at an early age tend to have male offspring with larger testicles and female offspring that are more fertile than progeny from bulls with small testicles. The general bull population is made up of several breeds of bulls of varying ages and sizes. There are large differences in the reproductive capacities among bulls of the same breed and age or weight. Fertility ranges from sterile and sub fertile to highly fertile within all breeds. Generally, about one or two bulls in five in an unselected population are not satisfactory because of inadequate semen quality, problems that prevent copulation, or lack of libido (sex drive). The highest incidence of satisfactory bulls is found between two and three years of age.

## **What is a breeding soundness evaluation?**

A breeding soundness evaluation is a prediction of a bull's potential reproductive capacity based on standard measurements and interpretations of certain selection criteria that are related to the desire and ability to breed and to fertility based on measurements of testicular development and certain seminal characteristics. The BSE includes an assessment of the libido and physical

ability to breed, testicular size as measured by scrotal circumference, and semen quality and quantity. Any physical defect or continuous lack of libido that interferes with the desire and ability of the bull to breed results in that animal being considered as unsatisfactory, even if he has satisfactory testicular development and seminal characteristics. A complete BSE examination should include the following components:

1. Physical examination for *abnormalities* that could interfere with the desire and ability of the bull to breed. The bull should be observed while he is walking on a hard surface. Any lameness or locomotor problem that could impair mating ability should be noted. It is not practical to carry out a complete clinical examination of every system in the body during a BSE; however, the bull must have good eyesight and be in good health.

2. *Libido*, or sex drive, is an important and often overlooked component of breeding evaluations. Studies have shown that libido in a yard test is highly correlated with serving capacity in the pasture, and that almost 10% of bulls could be culled because of inadequate libido. Because libido is heritable (0.59), a serving capacity test also offers the opportunity to reduce the incidence of this undesirable trait in bull populations. Unfortunately, this ingredient of the BSE is the most difficult and inconvenient to evaluate, and often does not receive adequate attention from the producer or veterinarian.

3. Examination of the *genital organs* should be a part of the BSE and include inspecting the penis for physical defects that could impair or prevent copulation. Scrotal and testicular palpation should be conducted to

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Originally published in 1995 as Hawaii Animal Health Series Fact Sheet #95-2; reissued with minor revisions. Brad LeaMaster is a former veterinarian with the CTAHR Department of Animal Sciences.

detect any abnormalities which might have an effect on fertility. Common abnormalities include small testicles, soft testicles, difference in the size of testicles, scrotal hernia, scrotal dermatitis, cryptorchids (high flankers), and palpable epididymal conditions.

A rectal examination should be performed by a veterinarian and include palpation of the pelvic urethra, prostate, vesicular glands, ampullae, vas deferens, and internal inguinal rings. The most common abnormal finding associated with the internal genital organs is seminal vesiculitis.

**4. Scrotal circumference** measurement is easy to perform and contributes important information to the BSE. Bulls with a large scrotal circumference (as a reflection of large testicles) produce more semen, have a higher prevalence of normal sperm, and have greater sperm motility than bulls with small scrotal circumference. In beef cattle, there is a high correlation between scrotal circumference measurements in bulls and the age at which female progeny reach puberty. Females from sires with above average testicle size reach puberty at an earlier age. Selection based on scrotal circumference offers another opportunity to improve fertility in herds.

**5. Semen evaluation.** Sperm motility and morphology are the seminal characteristics that are most highly correlated with fertility and are the most easily repeated. Characteristics such as volume, concentration, and percentage alive are no longer used as scoring criteria because there is a low correlation with fertility and because repeatability within bulls and between ejaculates is poor, especially in electroejaculated samples.

### When to evaluate bulls

Sires may be evaluated at any number of times and as often as desired. Evaluation just prior to the breeding season has the advantage that the evaluation indicates breeding ability at the time nearest the time of use. Males are normally gathered at this time for observation, so unnecessary labor and stress are eliminated. A disadvantage of testing just prior to the breeding season is acquiring replacements. If several bulls are unsatisfactory it may be difficult to find replacements of the desired quality.

Evaluation during the off season when bulls are plentiful offers an excellent opportunity to purchase new sires. Prices should be best at this time. The disadvantage is that the bull selected may injure himself or become sick between the time of evaluation and the breeding season.

Occasionally, a producer conducts a BSE during the breeding season to determine if the sire is keeping his sperm production up while breeding the herd. Evaluation is done after three to four weeks into the breeding season. By this time all females should have been in estrus, and the bull should have had the opportunity of breeding each. The presence of poor quality semen at this time would indicate overuse. The bull should be rested and a replacement selected.

A BSE at the end of the breeding season is of little value to the current breeding season; however, it does allow the producer an opportunity to eliminate any undesirable bulls so they will not be carried over several months without any economic return.

Bulls may be tested anytime there may be a doubt or question regarding a bull's fertility. For example, if females continue to recycle, indicating they are not bred, then the bull that is supposed to be breeding them should be examined. This could be done at any time the producer desires, with adjustments made accordingly.

A veterinarian is not required to be present for all of the segments of the BSE. For example, the evaluation of the social interaction of the bull among other bulls and its libido and ability to breed can be done by the producer, thereby saving money.

### Benefits of a BSE

Research studies have shown that when bulls were given a BSE prior to breeding, as compared to none in previous years, the pregnancy rate increased by 3.5%, the breeding season was shortened, calf weaning weights increased, and the bull-to-cow ratio increased from 1:20 to 1:30.

### References

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### Acknowledgement

The authors extend their thanks and appreciation to Mr. Victor Groves for graphics and technical services.

**Table 1. Sample BSE scoring system****Scrotal circumference (cm)**

Rating	Age (months)				Score
	12–14	15–20	21–30	>30	
Good	>35	>37	>39	>40	40
Fair	30–35	31–37	32–39	33–40	24
Poor	<30	<31	<32	<33	10

**Sperm motility**

Rating	Gross	Individual	Score
Very good	Vigorous swirls	Rapid, straight	20
Good	Slow swirls	Moderate, straight	12
Fair	No swirls, some oscillation	Slow, straight	10
Poor	Little movement, sporadic oscillation	Very slow, erratic	3

**Sperm morphology**

Rating	Primary abnormalities	Total abnormalities	Score
Very good	<10	<25	40
Good	10-19	26-39	24
Fair	20-29	40-59	10
Poor	>29	>59	3

The scores for the three categories are summed. If the total score is 60 points or more, the bull will probably be a satisfactory breeder; if the score is 30 or less, the bull classifies as unsatisfactory; and if the score is between 30 and 60 the bull is classified as a questionable potential breeder. Judgment must be used in interpreting the score. If a bull scores high on two criteria but has a serious problem with the third, the bull should be classified as a questionable potential breeder, even if the score is above 60 points. The score should be used only as a guide to assist in making intelligent management decisions.