Examining Breeding Soundness of Beef Bulls

A herd bull that will serve a higher percentage of cows during a limited breeding season is essential to a successful cow-calf operation. In many of these operations, however, the bull's role in the herd's reproductive performance is taken for granted.

The bull's fertility is several times more important than that of a cow. Each bull can be expected to serve as many as 30 cows. The bull also contributes half of the genetic potential of the entire calf crop, while each cow is expected to wean only one calf each year. Sub-fertile bulls frequently cause low calf crop percentages; they also may be the reason for poor herd weaning weights. Poor fertility or infertility in bulls can be expensive to the cow-calf producer.

The reproductive function of bulls depends upon:

- sexual desire,
- mating ability
- The formation and deposition of semen.

Determining the condition of all body systems that affect reproduction is as important as determining the status of the genital system. Performance records and pedigrees are important, but the sires must be capable of serving cows.

To help eliminate losses due to infertility, evaluate beef sires for breeding soundness 30 to 60 days before the beginning of the breeding season to allow time to replace questionable or unsatisfactory bulls. A breeding soundness evaluation should include:

1. A physical examination
2. Examination of the reproductive tract
3. A semen evaluation
4. Evaluation of mating desire

Physical Examination

A physical examination should include observing all conditions that might interfere with the bull's ability to locate cows in heat and mate with them.

Body Condition

A thin, half-starved bull will not have the stamina to serve a large number of cows during a short breeding season. Over fat bulls tend to lack vigor and will not breed up to their potential.
**Feet and Legs:**
A bull cannot locate and mate cows unless his feet and legs are sound. Structural faults, such as sickle hocks and post legs, can cause sore feet and stresses on tendons and joints that affect the bull's mobility. Legs and joints should be free from any swelling or old injuries. Cracked hooves, corns and long hooves also slow the breeding ability of bulls. Trim long hooves and corns four to six weeks prior to the breeding season. This will give the bull time to recover and have sound feet before he is turned out for breeding.

**Eyes:**
Eyes should be clear and free of injuries or diseases. Pink eye or cancer eye hinder a bull's vision and reduces his breeding effectiveness. Such problems may also allow him to be dominated by other bulls and diminish his ability to cover the desired number of cows.

**Sickness and Disease:**
Any other tendency toward disease or sickness should be evaluated prior to turning bulls out for the breeding season. Lump jaw, poor teeth or other factors that affect a bull's ability to eat greatly reduce his breeding potential. Respiratory problems also have a negative effect on breeding ability.

---

**Examination of the Reproductive Tract**

Make a complete examination of the reproductive tract for disease and abnormalities.

**Rectal Examination:**
The internal reproductive organs play an important role in the bull's ability to settle the required number of cows during a breeding season.

**Prostate:**
Detectable abnormalities of the prostate, a gland located just over the pelvis, are comparatively rare. *Seminal vesicles*--An infection of the pair of lobular, irregular glands that extend from the body of the prostate is called seminal vesiculitis. It is common in bulls. Decreased semen quality and pus in the ejaculate are usually associated with the infection and swelling.

**External Examination: testes and scrotum.**
The spermatic cord, scrotum, testes and epididymis can be palpated externally. Inflammation of these organs is not uncommon. The testicle should be firm, neither soft nor hard. The upper portion of the epididymis should be soft, pliable and free of any lumps or enlargements. During the winter months a bull's scrotum may be frostbitten or frozen. Check for this condition, because severe frostbite at the bottom of the scrotum can damage the tail of the epididymis enough to prevent or severely reduce the passage of semen.

**Scrotal Circumference:**
Scrotal circumference is highly correlated with semen-producing capacity in young bulls. Cull bulls that lack adequate scrotal development or examine them for defective semen quality. The scrotal circumference is easy to measure and is a highly repeatable measurement.
**Penis and Prepuce:**

When examining the penis and prepuce, look for inflammation, preputial abscesses, adhesions of the penis and penile deviations *(Figure 3)*. During erection the penis should come from the sheath parallel to the body of the bull.

![Figure 1.](image1)

**Figure 2.** Persistent frenulum

![Figure 2. Persistent frenulum](image2)

**Figure 3. Spiral deviation of the penis**

![Figure 3. Spiral deviation of the penis](image3)

**Semen Evaluation**

Semen quality should be determined by an experienced veterinarian or reproductive physiologist. An examination of the reproductive tract may indicate possible abnormalities in semen quality. But, bulls exhibiting normal physical capabilities may still be incapable of settling cows because of poor quality semen. Several techniques have been devised for semen collection; the most common use an artificial vagina or an electro-ejaculator.
Volume:
Volume is important, but it varies with the age, size and breed of the animal, and with the collection methods.

Colour:
Colour also is an indication of semen quality. The semen should be milky in appearance and free of contaminants such as blood, urine, dirt or pus.

Motility:
Motility can be estimated by observing the mass movement of a concentrated sample of semen. Semen graded as very good has vigorous swirls; that graded good has slow swirls. Poor semen motility indicates limited or no motility. Semen should have more than 50 percent vigorous, motile sperm when diluted and viewed through the microscope. Be sure that motility is not hindered prior to the motility score observation. Temperature, shock and other factors can greatly interfere with motility scores.

Morphology:
Abnormalities are classified as primary and secondary conditions. Primary abnormalities are slight defects of the tails of the sperm cells, such as proximal and distal protoplasmic droplets (Figure 4).

Mating Desire

A total breeding soundness evaluation should include an evaluation of mating desire. The breeding soundness examination may identify sub-fertile or infertile bulls, but it does not identify bulls with low mating desire or libido. There is no practical way to measure potential mating desire, except by observing bulls with cows in heat. Studies of the reasons for poor breeding performance have found that 20 percent of the bulls found to have poor breeding performance had no desire to mate.
Figure 4.

Normal

Spermatozoa

Loose droplets

Tail

Coiled

Primary Abnormalities

Head

Pyriform

Round

Elongated, narrow

Microcephalic

Macrocephalic

Double

Abnormal acrosome

Secondary Abnormalities

Detached normal heads

Proximal protoplasmic droplet

Distal protoplasmic droplet

Bent tail

Detached galea capitis

Other Cells Occurring in Semen

Midpiece

Kinked

Double

Swellen

Abaxial

Medusa formation

Epithelial cells

Leukocytes

Erythrocytes

Primordial spermiogenic cells