

Breeding Soundness Examination of Beef Bulls

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The herd bull that will settle a high percentage of cows during a limited breeding season is essential to a successful cow-calf operation. In many cow-calf operations, the role of the bull in the reproductive performance of the herd is taken for granted.

Fertility of the bull is several times more important than that of a cow. Each bull may be expected to settle as many as 30 cows. The bull 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. Every cycle that a female fails to conceive can cause a 35- to 45-lb. loss in calf weaning weights. Poor fertility or infertility in bulls can be expensive to the cow-calf producer. Research has shown that about 20 percent of all beef bulls are deficient in some aspect of reproductive capacity.

The reproductive function of bulls depends upon sexual desire, mating ability, and the formation and deposit of semen. Determining the condition of all body systems that affect reproduction is as important as determining the status of the genital system. The performance record and pedigree are important, but the sires must be capable of settling cows.

To help eliminate losses due to infertility, beef sires should be evaluated 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 observation of all conditions that might interfere with the bull's ability to

locate cows in heat and mate with them.

Body condition—Opinions vary among cattlemen as to how much condition a bull in breeding condition should have. The amount of condition, of course, will vary with the breed or type and age of the bull, length of breeding season and the number of cows per bull. A thin, half-starved bull will not have the stamina to settle a large number of cows during a short breeding season. Conversely, overly fat bulls tend to lack vigor and will not breed up to their potential. An Alberta study showed that feeding high energy diets to young Hereford bulls damaged their sperm-producing ability to the extent that several bulls were sterile. Also, there was an indication that the fertility in over-fed bulls diminished under moderate-to-heavy breeding pressure. One method of determining condition is measuring backfat. This, of course,

is most important when selecting replacement sires.

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. Long hooves and corns should be trimmed 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. Pinkeye or cancer eye hinder a bull's vision and reduce his breeding effectiveness. Such problems may allow him to be dominated by other bulls and diminish his abil-

Table 1. Physical Defects Affecting Breeding Soundness*

| | |
|--------------------------------------|-----|
| Internal Genital Organs | |
| Enlarged seminal vesicles | 388 |
| Seminal vesiculitis | 181 |
| Scrotal hernia | 17 |
| Enlarged inguinal rings | 11 |
| Testicular Defects | |
| Reduced size and hypoplasia | 960 |
| Soft | 806 |
| Abnormal shape | 104 |
| Fibrosis | 47 |
| Cyrtorchid | 14 |
| Defects of Penis and Prepuce | |
| Deviation | 190 |
| Neoplasms | 100 |
| Persistent penile frenulum | 57 |
| Lacerations | 26 |
| Urethral fistula (hypospadias) | 19 |
| Defects of the Epididymis | |
| Tumors, abscesses & granulomas | 52 |
| Epididymitis | 40 |
| Segmental apalasia and/or hypoplasia | 20 |
| Defects of the Locomotor System | |
| Hoof trim needed | 336 |
| Interdigital fibromas (corns) | 92 |
| Nonspecific lameness | 61 |
| Foot rot | 38 |
| Arthritis | 35 |
| Luxation | 17 |

*Internal genital organ statistics are based on examination of 7,359 bulls, all other systems on 10,940 bulls.

Modified from Carroll et. al. 1963.

ity 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 will greatly reduce his breeding potential. Respiratory problems also have a negative effect on breeding ability.

Reproductive tract examination

A complete examination should be made of the reproductive tract for disease and abnormalities. Table 1 is a summary of some field observations of 10,940 bulls relating to genital organ abnormalities.

Rectal examination—The internal reproductive organs play an important role in the ability of a bull to settle the required number of cows during a breeding season. Detectable abnormalities of the pair of lobular, irregular glands that extend from the body of the prostate is called seminal vesiculitis. It is common in bulls and is characterized by enlargement and loss of lobulation. Decreased semen quality and pus in the ejaculate are usually associated with the infection and swelling. Inflammation of ampullae (pencil-like organs that lie between the seminal vesicles) can cause enlargement, but the condition is rare. Internal inguinal rings are internal openings through which the spermatic cord passes. Herniation is rare in bulls. It can be detected by palpation of the rings. The condition of these internal organs play an important role in the bull's ability to settle cows. An examination of these can be done rapidly by an experienced technician.

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. Observations should be made for this condition, because severe frostbite at the bottom of the scrotum can damage the tail of the epididymis to prevent or severely reduce the passage of semen.

Scrotal circumference—This ranks as one of the most useful and valid measurements of a bull's breeding ability and cattlemen should make use of this indicator. (See the February issue, page 36.) Scrotal circumference is highly correlated with semen produc-

Table 2. Criteria for Acceptable Scrotal Circumference

| Age (in months) | Scrotal Circumference (in cm.) | | |
|--------------------|-----------------------------------|-------|------|
| | Very Good | Good | Poor |
| 12-14 | >34 | 30-34 | <30 |
| 15-20 | >36 | 31-36 | <31 |
| 21-30 | >38 | 32-38 | <32 |
| Over 31 | >39 | 34-39 | <34 |

ing capacity in young bulls. Research also has shown that bulls with larger testicles tend to sire heifers that reach puberty at a younger age. Table 2 provides a guide for determining acceptable scrotal circumference for sires of different ages as recommended by the Society of Theriogenology. Bulls that lack adequate scrotal development should be culled or examined 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 one should look for inflammation, preputial abscesses, adhesions of the penis, and penile deviations. The penis should come from the sheath during erection parallel to the body of the bull.

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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 that exhibit normal physical capabilities may be incapable of settling cows because of poor quality semen. Several techniques have been devised for semen collection. The most common methods utilize an artificial vagina or an electro-ejaculator.

Volume—Volume is important, but the volume varies with the age, size and breed of the animal and with the collection methods.

Color—Color 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 very good has vigorous swirls. Semen 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 a microscope. Care should be taken that motility is not hindered prior to motility score observation. Temperature, shock and other factors can greatly interfere with motility scores.

Morphology—There is considerable evidence that increased abnormalities of sperm cells are associated with poor conception rates. 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.

Many scoring systems have been devised to identify semen quality. Good quality semen should include less than 20 percent abnormal cells. Many abnormal heads or tails indicated low semen quality. A bull should be classified:

1. A satisfactory potential breeder
2. A questionable potential breeder
3. An unsatisfactory potential breeder

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 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. Current research on libido scoring techniques will likely devise test procedures which can be used on the ranch. 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. This work on breeding desire indicates that lack of libido may help explain poor conception rates in some herds, and that it would be desirable for seed stock producers to screen bulls for this trait.

A breeding soundness examination is not a scientific determination, it is merely a judgment or opinion based on the factors discussed which are important in breeding soundness. AJ

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