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## G83-666 Breeding Soundness Examination of Beef Bulls

James A. Gosey

University of Nebraska-Lincoln, jim@gosey.net

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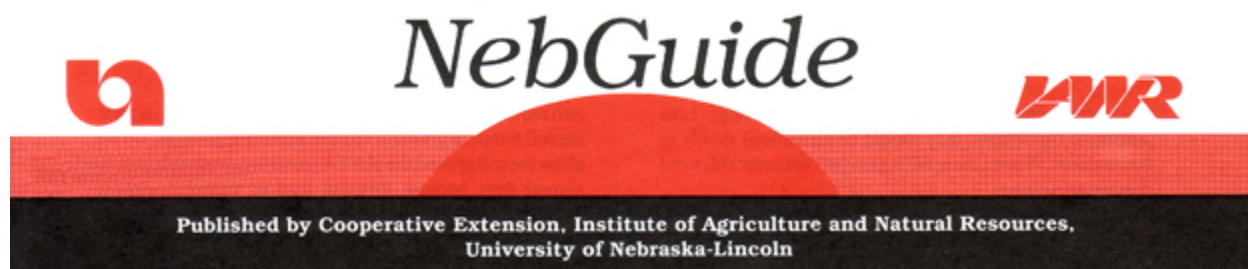
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## Breeding Soundness Examination of Beef Bulls\*

**This NebGuide describes factors to consider when evaluating a beef bull's reproductive ability. These include the reproductive tract, semen and mating desire.**

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*James A. Gosey, Extension Beef Specialist*

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A herd bull that will settle a higher percentage of cows during a limited breeding season is essential to a successful cow-calf operation. In many cow-calf 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 settle 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. Every cycle that a female fails to conceive can cause a 35 to 45 pound 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 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 settling 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

Opinions vary among cattlemen as to how much condition a bull in breeding condition should have. The amount of condition, of course, varies 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. There was also 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. Backfat measurements are most accurate when taken at the approximate age and weight at which the offspring of the bull would be slaughtered. Adjust all measurements to a common age to allow comparison. Backfat thickness at the 12th rib is highly heritable and is fairly easy to measure. Figures have been developed to estimate the influence of the measurement of backfat on the bull's progeny.

### 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

**Table I. Physical Defects Affecting Breeding Soundness\***

<b>Internal Genital Organs</b>	
Enlarged seminal vesicles	338
Seminal vesiculitis	181
Scrotal hernia	17
Enlarged inguinal rings	11
<b>Testicular Defects</b>	
Reduced size and hypoplasia	960
Soft	806
Abnormal shape	104
Fibrosis	47
Cryptorchid	14
<b>Defects of Penis and Prepuce</b>	
Deviation	190
Neoplasms	100
Persistent penile frenulum	57
Lacerations	26
Urethral fistula (hypospadias)	19
<b>Defects of the Epididymis</b>	
Tumors, abscesses & granulomas	52
Epididymitis	40
Segmental apalasia and/or hypoplasia	20
<b>Defects of the Locomotor System</b>	
Hoof trim needed	336
Interdigital fibroma (corns)	92
Nonspecific lameness	61
Foot rot	38
Arthritis	35
Luxations	17
*Internal genital organ statistics are based on examination of 7,359 bulls, all other systems on 10,940 bulls. Modified from Carroll <i>et al.</i> 1963.	

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. *Table I* 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 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 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. *Ampullae*--Inflammation of these pencil-like organs that lie between the seminal vesicles can cause enlargement, but the condition is rare. *Internal inguinal rings*--These 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. They can be examined rapidly by an experience technician.

**External Examination:***testes and scrotum.*

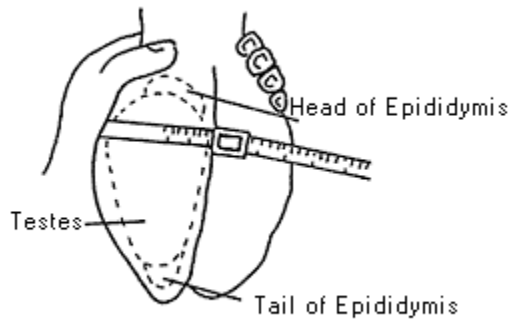
The spermatic cord, scrotum, testes and epididymis can be palpated externally. Inflammation of these organs is not uncommon. The testicle should be firm, neither soft nor hard. The upper portion of the epididymis should be soft, pliable and free of any lumps or enlargements. During the winter months 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:**

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. Scrotal circumference is highly correlated with semen-producing capacity in young bulls. Research has also shown that bulls with larger testicles tend to sire heifers that reach puberty at a younger age. *Table II* is a guide for determining acceptable scrotal circumference for sires of different ages as recommended by the Society for Theriogenology. 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. *Figure 1* shows how this measurement is taken.

**Penis and Prepuce:**

When examining the penis and prepuce, look for inflammation, preputial abscesses, adhesions of the penis (*Figure 2*), and penile deviations (*Figure 3*). During erection the penis should come from the sheath parallel to the body of the bull.



**Figure 1.**

**Figure 2. Persistent frenulum**



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

## **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.

### **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 as very good has vigorous swirls; that graded good has slow swirls. Poor semen motility indicates limited or no motility (see *Table II* for the Society of Theriogenology scoring system for 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:**

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 (*Figure 4*). *Table II* shows the Society of Theriogenology scoring system for morphology.

<b>Table II.</b>					
<b>Scoring</b>	<b>Criteria</b>	<b>Ver. Good</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
Scrotal Circum. by Age	12-14 mos.	>34 cm	30-34	<30	<30
	15-20 mos.	>36 cm	31-36	<31	<31
	21-30 mos.	>38 cm	32-38	<32	<32
	over 31 mos.	>39 cm	34-39	<34	<34
SCORE FOR SCROTAL CIRCUMFERENCE:		40	24	10	10
<b>Semen Morphology</b>					
-- Primary Abnormalities		<10	10-19	20-29	> 29
-- Total Abnormalities		<25	26-39	40-59	> 59
-- SCORE FOR -- MORPHOLOGY		40	24	10	3
<b>Gross Motility</b>	<b>Rapid Swirling</b>	<b>Slower Swirling</b>	<b>Generalized Oscillation</b>	<b>Sporadic Oscillation</b>	
Individual	Rapid Linear	Moderate Linear	Slow Linear to Erratic	Very Slow Erratic	
SCORE FOR MOTILITY:	20	12	10	3	

Many scoring systems have been devised to identify semen quality. Good quality semen should have fewer than 20 percent abnormal cells. Many abnormal heads or tails indicate low semen quality.

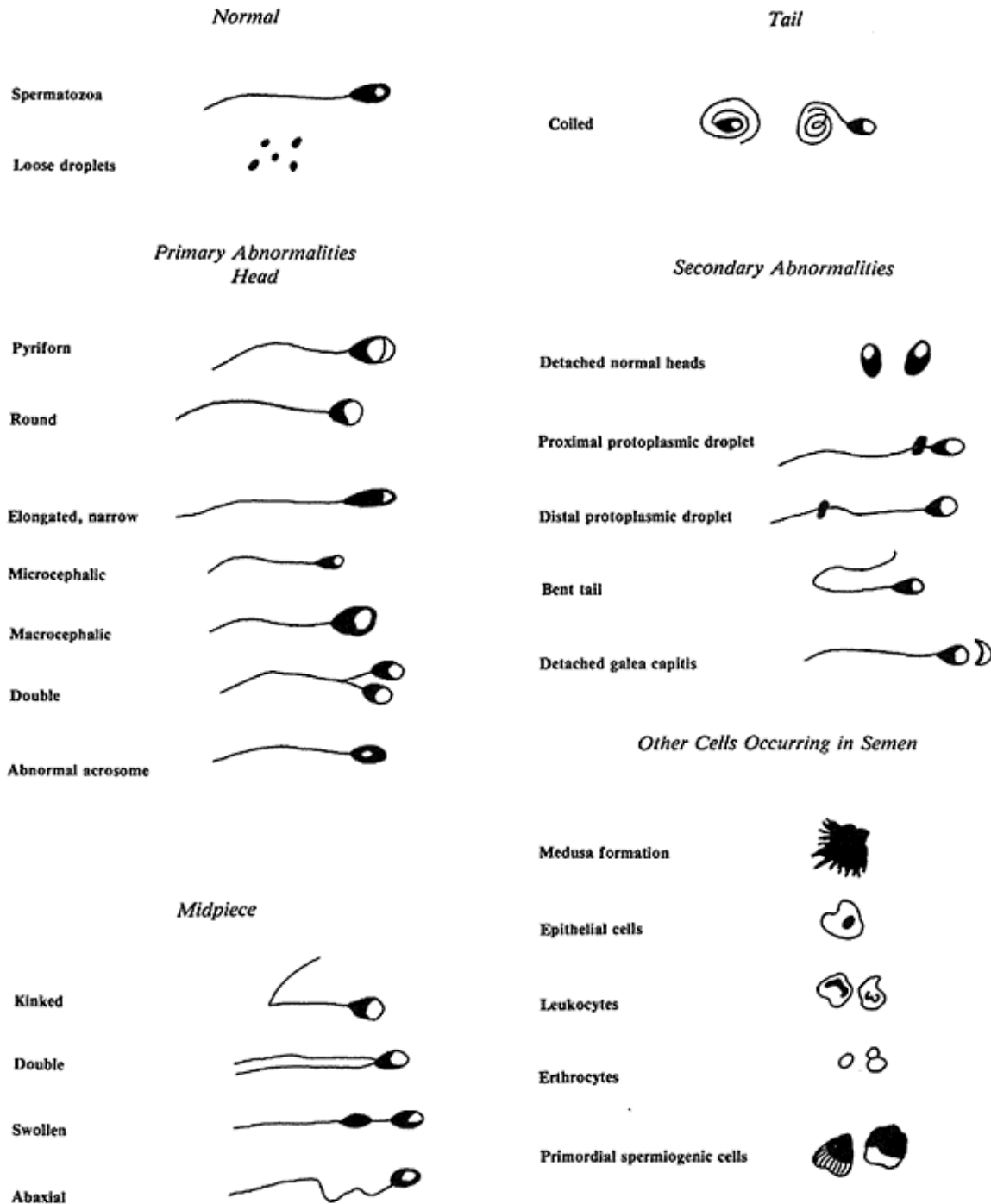
A bull should be classified:

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

A breeding soundness examination is not a scientific determination. It is merely a judgment or opinion based on the factors that are important in breeding soundness.

## 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. Current research on libido scoring techniques will likely devise test procedures that 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 indicates that lack of libido may help explain poor conception rates in some herds, and that it would be desirable for seedstock producers to screen bulls for this trait.



## Figure 4.

\*Adapted from Great Plains Beef Handbook Fact Sheet GPE-8252 by Roger Brownson, Extension Beef Cattle Specialist, Montana State University.

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