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What to Expect From a Breeding Soundness Examination

by Heather Smith Thomas

Many factors play a role in the fertility and the breeding ability of bulls, including semen quality, conformation, soundness and a desire to breed cows. It is recommended every bull pass a breeding soundness examination before being put out with cows.

How to prepare

Do not wait until the last minute to have bulls evaluated, but do check them at some point before turnout this year. A bull that was fine last year, or even last fall, may have issues this year. He may have gotten injured sparring with other bulls over winter, had an infection or suffered from scrotal frostbite.

Most people check young virgin bulls to make sure they are mature enough and fertile, but many producers do not bother to check older bulls. Yet bull fertility and breeding soundness may depend on how they wintered. If they had a hard winter with cold weather and wind, they may have a lot of abnormal sperm.

Knowing the history of each bull is important, and sharing that information with the vet is very helpful in conducting an accurate breeding soundness exam.



A bull's age, breeding history, previous complications and ranch management – nutrition and vaccination programs – are all important details to disclose. For bulls that have serviced cows, data and history on each bull and his calf crop are needed.

Also, be prepared to ask any questions about a certain bull which had an earlier problem. If he had an infection or injury that was treated, you may want him checked more thoroughly.

What to expect

There are specific things the vet will assess and measure, with set standards for what is acceptable, to determine whether a bull passes or fails. There are also several things a breeding soundness exam cannot do, such as assess libido – the desire to breed cows. Some producers think of a breeding soundness exam as semen testing, but there are many other components of the exam that are just as important. Here are the categories the vet will evaluate:

Soundness. The first thing assessed is health and soundness. Does the bull have good feet and legs, affording him the ability to mount and breed a cow? In

young bulls, conformation is extremely important. In older bulls, injuries to feet, legs, eyes, back, etc. could be a problem. The vet will exam the bull's reproductive organ and external genitalia. The prepuce/sheath is inspected for conformation and abnormalities. The scrotum is examined for conformation, symmetry and the presence of lesions. Testicles are palpated to see if they are normal consistency or too hard or too soft. One common problem is injury to the prepuce, and there may be lesions on the scrotum if winter was cold. Sometimes injuries occur when a bull is traveling through the brush.

It is also important to be sure the bull is free of disease, and this means knowing the history of the herd. You do not want to bring in bulls that might carry contagious diseases or something you do not already have in your herd like warts or ringworm – or a breeding disease like vibrio or trichomoniasis. If there is any chance a bull has been exposed to trichomoniasis, your vet can take a sample from inside the sheath for testing.

Scrotal circumference. Size and shape of the scrotum should be of adequate size for the age of the bull. In the U.S. the same standard is used for all breeds regarding minimal size. Scrotal circumference is important because size of the testes determines how many spermatozoa are produced daily. This is usually what determines how many cows can be put with a bull. If a mature bull has at least the minimum scrotal circumference, he can be used with at least 25 cows. A young bull should have at least the minimum scrotal size for his age.

Palpation of internal sex organs. The vet will check for an inguinal hernia by palpating the inguinal rings and do a transrectal palpation of internal sex organs to check for seminal vesiculitis or vesicular adenitis – one of the most common infectious problems in bulls and one that can result in poor fertility and poor semen quality. The glands and seminal vesicles should not be enlarged or painful or have any adhesions. Some abnormalities in semen may indicate a problem, and the vet may go back and palpate again to determine if there is a problem in the seminal vesicles.

Bulls with seminal vesiculitis have an increased number of abnormal sperm and poorer semen quality. Prognosis depends



PHOTOS BY MARTHA MINTZ

Prior to a full examination, producers should assess bulls for soundness as it is a paramount trait in good breeding stock.

on the severity of the condition and the age of the bull. Sometimes younger bulls can get rid of the infection on their own. In older bulls, this infection tends to be a bigger problem because they generally do not respond to treatment.

Many factors can cause seminal vesiculitis, including a blood-borne infection or an ascending infection from the reproductive tract. A common factor in young bulls is that at about the time they are reaching puberty and are being fed high energy and high protein rations, they may experience subclinical acidosis with some bacteria spreading from the gut. Other possibilities include systemic viral or bacterial infections. These problems may happen more often with young bulls because they are growing and their accessory sex glands are becoming active, making them more prone to infection. Older bulls may pick up reproductive tract infections from breeding infected cows.

Semen collection and checking the penis.

The last part of the exam is semen collection and evaluation. The most commonly used technique is electroejaculation — using electric shock to stimulate the bull to ejaculate so that semen can be evaluated under a microscope. The vet will usually take this opportunity to examine the shaft of the exteriorized penis to look for abnormalities, lesions and problems with extension. One of the most common injuries in bulls is preputial adhesions, making it impossible to fully extend. An injured prepuce or broken penis can occur if a bull gets hit by another bull when trying to breed or if the penis was not completely retracted when chasing a cow through brushy terrain, getting it snagged and torn. It may heal with adhesions to the sheath.

Another common problem is penile warts. These are caused by the bovine papilloma virus and can be contagious — in some situations a group of young bulls may all have warts on the penis. Large warts can interfere with mating. Warts can be removed surgically, and affected bulls should be checked again since warts may recur.

Another problem seen in younger bulls is persistent frenulum, where the penis has not completely detached from the prepuce. This is considered an inherited problem. It can be easily treated by cutting that attachment, but since the condition tends to be inherited, the bull should only be used in a herd where all offspring are sold as beef. If it is a very young bull (10 months of age) and there is just a little tag of attachment, it may be just a sign of immaturity.

Semen evaluation. The semen sample must be representative of what the bull is producing, so it must be obtained according to certain standards. Looking at just one drop of semen is not a true examination. The vet will try to get an adequate sample with good concentration and one not contaminated with urine. The sample needs to be protected until it is examined. If the evaluation is done outside on a cold day and semen is placed on a cold slide, this procedure may chill the sperm and hinder motility.

Cold may also affect the way the sperm look after staining. Staining allows for a look at semen morphology



Evaluating bulls at the beginning of each breeding season is vital to overall productivity within a herd.

(form and structure) to determine if there are abnormalities. The vet will note the proportion of normal sperm and abnormal sperm. The standard technique is to use a slide stained with eosin nigrosine. The nigrosine (black stain) provides a background so sperm can be seen. The eosin stain penetrates the sperm and stains them pink or red so they can be easily seen under the microscope. The vet has to examine at least 100 sperm and determine the proportion of normal sperm and the proportion of each type of abnormality. Some have more effect on fertility, but each abnormality tells something about what is going on with that bull. Regardless of the type of abnormality, the important thing is a bull must have at least 70 percent or more normal sperm.

The vet might pay closer attention to the type of abnormality when testing a valuable bull to better predict how he will improve or to determine if a follow-up evaluation is necessary. Further investigation is also common if an entire group of bulls have the same abnormalities.

For example, after very cold weather and exposure to wind, semen will have morphological changes and a certain number of abnormalities. Semen morphology can also be affected by a ration high in cottonseed with high gossypol levels. The vet and the producer can decide whether to retest later to see if the sperm becomes more normal.

Another thing to consider is whether the first ejaculate is typical of what a bull will produce. The first ejaculate may contain an accumulation of old sperm if the bull has not been breeding cows. Some bulls must be collected several times before they “clean out” to get a true picture of their semen. A bull may be retested once or several times, depending on results and on how long the producer wants to wait. Retesting may also depend on whether the bull is scheduled for a sale.

Staining used in evaluating semen does not show other cells, just sperm. It will not show inflamed cells. When dealing with a young bull that will be going to a sale, a breeding bull whose motility is not what it should be or if the

vet suspects an infection, other stains can be used to better visualize inflamed cells or germinal cells — if there is a potential testicular problem.

Just a screening

The purpose of a breeding soundness exam is to pinpoint and to remove any bulls with problems that will interfere with breeding ability and fertility. The initial examination is done on a pass or fail basis and is not a true fertility predictor.

Bulls are classified as satisfactory, deferred (to be retested for improvement) or unsatisfactory breeders. Satisfactory breeders do not have any problems in terms of history or physical examination and, on the day of the exam, meet minimum requirements for testicular size and sperm morphology and motility. If a bull is in the deferred category, the vet and the producer will decide on a course of action for further testing. Problems seen in deferred bulls are not extreme and can be resolved with either time or treatment. The vet may defer the bull for a few weeks before rechecking.

Bulls which fail the exam are classified as unsatisfactory. The younger bulls that fail generally have a problem with sperm morphology and/or inadequate scrotal circumference. A very young bull may fail because he is immature and his semen may contain a lot of proximal droplets. Many of those bulls will pass the exam at 15 months, but they need to be checked again. An unsatisfactory older bull should be culled. Common reasons for failure are too many abnormal sperm or physical unsoundness.

A breeding soundness exam does not test serving capacity, or libido. A bull can pass his exam but still will not actually breed a cow. Therefore, at the start of breeding season, all bulls need to be monitored to see if they are actually doing their job. **HW**

Editor's notes:

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