Vet Call

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Evaluating bulls prior to the breeding season

High productivity in cow-calf herds requires that cows become pregnant early in a controlled breeding season. Of course, cow fertility is important in order to have a successful breeding season — but even more important on a herd basis is bull fertility. While no currently available test is able to classify bull fertility with perfect accuracy, a thorough breeding soundness exam of bulls (BSEB) is the best tool for evaluating both adult and yearling bulls.

Breeding soundness exams

Approximately 10% to 20% of adult bulls will fail a comprehensive soundness examination, and replacing these bulls with bulls that pass a BSEB will reduce the risk that breeding failure is due to inadequate semen volume, sperm cell fertilizing ability, and semen delivery. Breeding soundness examinations consist of a complete physical examination, scrotal measurement as an indication of testicular size, and a semen evaluation.

The physical examination includes observing the bull as he moves — looking for inadequacies in movement, leg conformation and general body condition. The physical examination continues once the bull is confined by observing the eyes and teeth, noting any abnormal conformation. During the breeding season, bulls will travel many miles per day, and sound feet and legs are essential for mating success. Foot and leg problems that are genetically transmitted such as being post-legged or having screw claw should be heavily criticized and will cause a bull to fail a BSEB.

Respiratory disease and other illnesses that limit a bull's ability to be a sexual athlete will cause him to fail a BSEB, as will defects or damage to the penis. While confined in the chute, the bull's scrotum and testicles should be examined. The two testicles should be the same size and should be firm, but not hard. Damage to the testicle may be detected as a softening of all or part of the testicle, one testicle being smaller or larger than normal, or a testicle feeling hard due to scar tissue.

Semen motility and fertility

If a bull is determined to be free of noticeable health or structural problems, the next step in a BSEB is to evaluate the semen produced. In the United States, semen samples are most often collected with the aid of an electroejaculator, although other methods are also available. To keep the semen sample warm, veterinarians who are skilled at conducting BSEBs will have equipment that keeps the collection apparatus, slides, stain and other utensils warm. Semen samples are examined under a microscope to determine the amount of motility and sperm cell structural correctness.

Motility determination serves as an indication of both the percentage of sperm that are alive and the percentage that are correctly made. If sperm cells are alive, but malformed, motility is often negatively affected. By killing all the sperm cells in a sample (so they hold still) and then carefully examining the cells under high magnification, a skilled veterinarian can determine the percentage of sperm cells that appear normal and can gain information about the likelihood of improvement in bulls that have a high percentage of abnormal sperm.

Yearling bulls can be a challenge to accurately evaluate for fertility. Near the time of puberty, many of the sperm cells produced are abnormal in appearance and have poor motility. Veterinarians know that most of these young bulls with poor semen characteristics will greatly improve with only a few more weeks of age — but no one can guarantee that a young bull with poor-quality semen will be a fertile breeder by the time the breeding season starts. Puberty is defined as the age at which a bull will produce a minimum of 50 million total sperm per ejaculation. Although bulls will reach puberty at a variety of weights and ages, scrotal circumference at puberty is fairly constant [about 28 centimeters (cm)]. Bulls that have a large scrotal circumference by yearling age will reach puberty earlier than similar bulls that have smaller testicular size. And larger scrotal circumference is associated with early puberty in daughter progeny.

Limitations

The limitations of BSEB fall into three categories: limitations of the procedure itself, limitations due to the skill of the examining veterinarian, and limitations because of the expectation and use of BSEB by cow-calf producers. The BSEB procedure and scoring system is most valuable to identify those bulls that have low fertility, but it is not as good at telling the difference between average- and superior-fertility bulls. The scoring system used by most veterinarians that do BSEB is developed by the Society for Theriogenology and was designed to be a minimum standard for acceptable fertility.

Breeding soundness examinations require good facilities and equipment to allow for thorough examination of bulls and their semen. Appropriate chutes, semen collection equipment, slide warmers, microscopes and stains are all required. Veterinarians can fail to provide a good BSEB if he/she is unable to adequately examine the bull to detect structural or health problems that would limit his ability to detect heat or deliver semen properly, or if he/she incorrectly interprets a semen sample when assigning a bull to either the satisfactory or unsatisfactory classifications. Misclassification of bulls is most often due to an incomplete examination.

Cow-calf producers can limit the usefulness of BSEB by pressuring a veterinarian to pass a bull or by purposefully selecting examiners that rarely fail bulls. It is not uncommon to find purebred bull producers that want a BSEB done on bulls that they merchandise, but do not want any of their bulls to fail a BSEB.

Despite their limitations, breeding soundness exams are a proven tool to remove a high percentage of problem bulls prior to the start of the breeding season and to improve herd and breed fertility by placing selection pressure on fertility. High bull fertility is an important component of high pregnancy percentages and herd productivity, and aggressive attempts to improve and protect bull fertility will be rewarded in the long run.

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