

Dairy Split Sessions

Moderators: Norm LaFauce, Connor Jameson

Breeding Soundness Evaluation: Physical Assessment

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Abstract

The bull breeding soundness evaluation (BSE) should be an integral part of any herd health management program to maintain and promote herd profitability and health. Physical examination of the bull is a very important aspect of the overall evaluation, and should be given careful consideration by the practitioner. The bull must be fit and in condition to properly identify and service the cows presented to him. It is the veterinarian's responsibility to evaluate body condition, foot and leg structure, reproductive system, temperament and quality. Other considerations, such as breed selection, evaluation of expected progeny differences (EPD), ultrasound data evaluation and feed trial performance may be requested of the veterinarian.

Proper equipment to conduct the evaluation and facilities for restraint of the bull are important. Mature bulls, particularly those of questionable disposition, require substantial facilities for evaluation. Selection and maintenance of the proper equipment is of major importance to the success of the examination. Malfunctioning equipment or lack of adequate restraint can seriously limit the veterinarian's ability to properly collect and evaluate a semen sample. A proper and complete exam can be of direct benefit to the owner, whether it be the consequence of a sale or a part of an annual exam before the breeding season. It should be considered as an insurance policy against the financial loss of a failed breeding season.

Introduction

The first and foremost consideration given to the bull breeding soundness evaluation (BSE) is health and physical soundness. As the average cost per herd sire continues to climb, it is only natural that expected revenue per bull will climb as well. Some producers expect bulls to service 40 to 50 females in a breeding season instead of 20 to 25, which was the average only a few

years ago. With such an increase in demand, it is no wonder the bull must be physically fit and capable of servicing as expected.

Advancements in technology have enabled the practitioner to become a more valuable asset to the producer who is selecting new herd sires. Ultrasound carcass evaluation, expected progeny differences (EPD), gene mapping and identification, and gain test data are just a few selection tools the practitioner should be familiar with when aiding the selection of herd sires.

New technology has allowed for a better prediction of progeny performance in the feedlot. Primary and secondary objectives of an operation must be considered before sire breed selections are determined. Such factors as breed disposition of the cow herd, climate and range conditions, retained ownership of production, female retention within the herd, replacement female sales and calving ease, should all be considered before recommendations can be made. There are beef breeds that have outstanding carcass merit, others with proven maternal traits, while others are ideal under large range or tropical conditions. Utilizing all information sources is critical, because one sire can have a positive impact on several generations of cattle within a herd.

The BSE should be conducted in six basic steps, each progressing to the next and all considered in the final step.

Step One

Whether evaluating 100 or one hundred bulls, the practitioner should take the time to walk into the holding pen to observe the bull's unrestricted movement. Notation of any defect in physical structure, pendulous sheaths, deformed or misshapen hooves, or problems with ambulation can be made. It also allows the practitioner to determine which bulls appear more dominant, which bulls may have disposition problems and if any bulls are over or under conditioned. Proper body condition is important, and bulls with body condition scores

(BCS) below 5 or above 7 should be scrutinized closely. Over conditioned bulls, particularly bulls with BCS of 9 or higher, should be evaluated closely for fatty deposits in the scrotal neck, as these can be detrimental to fertility. Also, over conditioned bulls must be “let down” slowly and physically conditioned before they are to be utilized in a pasture environment, otherwise these bulls will “melt down”.

After the initial evaluation is conducted and any observations recorded, the next step is the physical examination.

Step Two

Proper restraint is of extreme importance during the physical assessment portion of the breeding soundness evaluation. Although some bulls may handle well in a crowd alley, it is preferred to place bulls in a mechanical squeeze chute. This serves as protection for both the operator and the patient. I usually start my examination at the rear of the bull by performing the rectal examination of the internal reproductive organs. After the arm enters the rectum, a little past the wrist, the first structure encountered is the urethralis muscle. It is on the pelvic floor, covering the pelvic urethra. Massage of the cylindrical muscle will stimulate strong contractions, which feel like pulses along the pelvic floor. Moving forward on the pelvic urethra a “knob like” or “ring like” structure is palpable around the circumference of the urethra; this is the prostate gland. Just anterior and lateral to the prostate on each side are two flattened, lobulated structures, the seminal vesicles. Size of these organs varies by maturity and frame size, but usually they range from 2 to 6 cm in width by 6 to 14 cm in length.

Cysts and, or abscesses may occur in these glands and can be palpated, especially in young bulls. It is not uncommon to find as many as 10% of yearling bulls in a group to be affected by cysts or abscesses. Many reasons have been offered to explain the seminal vesiculitis syndrome, but none have been adequately proven. Older bulls can experience the same problem, but may be of a more chronic nature. The glandular structure can be quite firm, lacking its normal lobulated texture, and in more chronic cases, can be very fibrotic and firm on palpation (it may be twice as large as normal). The bull will respond painfully when the affected organ is manipulated. Inflammatory by-products (pus) in the semen will confirm the diagnosis. Further anterior to the seminal vesicles and prostate are paired tubular structures, 6 to 11 mm in diameter, which are the ampullae. There is very little pathology that occurs within these structures.

Further into the abdomen other organs are identified and examined. Rumen, omentum, peritoneum,

small intestine and internal inguinal rings should all be identified. Particular interest should be paid to the presence of any adhesions that may exist. The only abdominal structures to pass through the inguinal rings are the spermatic vessels and the ductus deferens. Any other structure present (omentum, small intestine) is foreign, and should be immediately noted. Inguinal rings larger than a three-finger size are considered abnormal, making the bull more susceptible to inguinal hernia. As this completes the internal exam, I usually will massage the pelvic urethra several times to prepare the bull for collection with the electro-ejaculator.

Step Three

Chute side, after the rectal exam, the practitioner should visually assess both scrotal and sheath structure, noting any irregularities. The scrotum should have a nice oblong shape with the testicles symmetrical in size and suspended properly (this is an important consideration in Brahman influence cattle). Any evidence of previous insult, scarring dermatitis, or fluid swelling should be duly recorded, as these signs may be relevant to any questions that arise in the forthcoming semen evaluation.

Palpation of the scrotal contents, sheath and penis is included in a thorough examination. The testicles are palpated individually as to size, shape, consistency or firmness (not too hard yet not too soft). Any painful areas within the testicle or any excessively hard (fibrotic) area should be duly noted. It should be made certain that the testicle moves freely within the scrotum and there are no adhesions between the testicle and scrotum.

Next, all portions of the epididymis must be scrutinized closely for any defects or changes, particularly in older bulls. The head of the epididymis is palpated at the proximal pole of the testicle near the craniolateral surface. The body of the epididymis lies on the caudomedial portion of the testicle and is not as easily palpated as the head or tail. It can be palpated by gently feeling between the testicles and palpating the medial surface of both testicles. The tail of the epididymis is on the distal pole of the testicle and is usually attached firmly. It is easily palpated and should be closely examined for any fibrosis or cystic areas. Any pain response elicited on palpation will usually indicate active inflammation. The tail folds upon itself and then ascends the medial aspect of the testicle as the ductus deferens. Palpation of the ductus should be attempted from its origin through its ascent of the spermatic cord into the inguinal ring.

Lastly, the scrotal neck should be carefully palpated for any adhesions, evidence of hydroceles, intestinal protrusion, or any vessel varicosities. The spermatic

vessels (artery, veins, ductus deferens) and cremaster muscle should be palpable in this region. An attempt to palpate the ductus deferens all the way to the external inguinal ring should be made, although this may be difficult to achieve.

Step Four

The final and most critical step in the physical portion of the breeding soundness evaluation is an accurate assessment of the scrotal circumference. Particularly when selecting young herd sires, accurate scrotal circumference is highly heritable and can be used as a predictor of fertility and maturity. Procedures correlating both testicular weight and volume, as well as sperm cell production per unit volume have been proven many times through the years. The heritability estimate for scrotal circumference in bulls is a range between .42 to .88, with .60 being the average. It has also been suggested that as scrotal circumference increases, the age at puberty decreases, in offspring of both sexes. This is very important information for commercial cattleman who want to retain females for production within the herd. In 1993, The Society of Theriogenology published a revised set of guidelines, including new recommendations for minimal scrotal circumference. The primary number to remember is 30 centimeters, which is the minimum circumference acceptable at puberty, which is 12 to 15 months. Following is the recommended criteria:

Age (Mo)	Minimum scrotal circumference (cm)
≤15	30
>15 <18	31
>18 <21	32
>21 <24	33
≥24	34

To measure scrotal circumference, both testicles are grasped and retracted to the ventral-most portion of the scrotum. The measuring tape is placed over the area of the greatest scrotal width and pulled down until snug. The first reading is then taken. It is recommended to repeat the procedure in order to insure an accurate measurement.

Step Five

A variety of methods may be utilized to collect a semen sample for evaluation, as this is the next logical step in the process. Electro-ejaculation is the most prac-

tical means of collection for bulls used in natural service and it is most commonly used. The rectal probe, with electrodes oriented ventrally, is inserted in the bull's rectum until the anal sphincter closes around the rear of the body of the probe and the tail is then pulled down to aid in retention. Several different types of ejaculators are available for use, but the technique of collection should be the same, involving a progression of steps that increase power sequentially and gently. Each power setting or control setting should deliver four to eight one-second pulses before moving to the next power setting. If manipulated properly, most bulls will develop an erect penis and will attain nearly full penile extension. This allows fractioning of the seminal plasma (clear pre-ejaculate fluid) from the ejaculate, which is cloudy to white in color. Collection of the sample should be completed once the ejaculated fluid turns clear. The collection of a sample discharged from the prepuce of a non extended bull is not desirable because of contamination with preputial debris. Every attempt should be made to extend the penis and prepuce. The bull should not be classified as satisfactory without the exam.

Step Six

The final step in the process is examination of the semen sample. This requires an adequate microscope (either bright field or phase contrast), semen stains, glassware and warming trays and a suitable working area for the exam. A good working knowledge of sperm cell morphology and classification is a must.

Conclusion

The breeding soundness evaluation is an important tool used in the herd sire selection process. It is a valuable resource to assure herd profitability and production when used in annual herd sire examinations prior to breeding season. To be successful and promote producer confidence, the examination should be performed professionally and consistently within the established guidelines set forth by The Society of Theriogenology.

References

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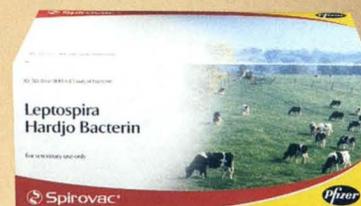


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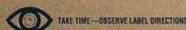


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