VET CALL by Bob Larson, DVM
INDUSTRY UPDATE

Breeding Soundness Examination of Bulls

The development and continued evolution of the breeding soundness examination of bulls has led to some of the most important advances in bull fertility in the last four decades, But despite the wide acceptance of breeding soundness examinations, there is still much contusion on how to utilize this valuable tool.

New information since the breeding soundness examination was first introduced has led to improved methods and interpretation of the results. There have been several formal modifications of the breeding soundness examination and I will describe the current thinking on breeding soundness examination of bulls.

The need for breeding soundness examination of bulls is based on several premises. These are:

1. **A significant number of prospective breeding bulls are infertile, subfertile, or unable to copulate.**
2. **The most certain way to determine breeding soundness is to use the bull in natural service on 20 to 30 fertile cows. Conception rates will then provide a reliable measurement of fertility.**
3. **Evaluation by natural service is time consuming and expensive; therefore, other techniques for evaluation of breeding soundness prior to the breeding season are necessary.**

Breeding soundness examinations are most commonly performed in three situations: before purchase, before the breeding season, and after breeding problems become apparent. But, as we evaluate its use, you should recognize the limitations. The examination will only be as accurate as the skill and equipment of the examiner allow. It should also be remembered that it reflects an animal's breeding soundness only on the date tested. It does not reflect the bulls soundness in the past, neither does it definitely define the bull's ability to cause conception in the future. The overall effect of breeding soundness examination is to eliminate many infertile bulls and to improve the genetic base for fertility within the herd and breed.

Breeding soundness examinations consist of a complete physical, scrotal measurement as an indication of testicular size, and 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. The lungs and heart are evaluated and a rectal exam is performed to determine the health of internal reproductive organs. The penis should be manually exteriorized and examined for indications of injury or disease. The testes and epididymis are palpated for evidence of degeneration or inflammation.

Once the physical examination is complete and the scrotal circumference has been determined with a tape measure, a semen sample is collected either with the aid of an electroejaculator, massage of the prostate, or use of an artificial vagina and a mount animal. The semen sample is evaluated for sperm motility and for the presence of excessive numbers of abnormal sperm.

Once the evaluator has collected all the available information, he/she determines if the bull is a satisfactory breeder on the day tested. He/she may also give an indication of the severity of any abnormality and a prognosis for recovery and use as a breeder in the future. The exam is basically a pass-fail test and one bull that passes the test cannot score higher than any other bull that passes it.

If a bull fails any part of the examination, he fails the entire test. For example, if a bull has an excellent scrotal circumference and excellent semen motility, but has rear leg conformation that limits his ability to cover a breeding pasture -he fails the examination and is not considered a satisfactory breeder.

Another important concept for bull producers to realize is that for many situations, a single failure does not mean that the bull is subfertile. In young bulls, and bulls collected with an electroejaculator it's possible to collect samples that contain only accessory gland fluid and semen with poor motility. If these bulls are given a few days rest and tested again, a more representative sample may be collected.

One of the most common causes of subfertility of bulls is due to heat stress either from high environmental temperatures or elevated temperature due to fever. In cases where a bull has had a high fever, abnormal sperm appear in the ejaculate approximately two weeks after the heat stress and continue to increase for about one month. After that time, gradual improvement is seen. Normal semen is usually not produced until about three months later. In such a case, the bull could not pass as a satisfactory breeder today but if he is rested and retested in three months, he could easily pass the breeding soundness examination and function as a fertile bull.

This example also points out the limitation of utilizing breeding soundness examination to diagnose cow herd infertility. If a pasture only has one bull and he develops a high fever and subsequent poor quality semen, the cows may have a very poor conception rate, but by the time the situation is determined, the bull could easily pass the exam.

As opposed to heat stress, other abnormalities detected in a breeding soundness examination will not improve over time and the examiner can give a poor prognosis for recovery. These would include: abnormally small testes, a scrotum damaged by trauma or frostbite, an abnormal penis or poor leg conformation.

By understanding the tremendous opportunity to improve the breeds fertility by rigorous use of breeding soundness examination, and by grasping its limitations for individual bulls, producers can more effectively utilize this valuable tool. Every bull should have a breeding soundness examination performed before every breeding season to ensure that the cows are exposed to a fertile bull.

By committing to a breeding soundness examination program for all the bulls you use and sell, over time, the fertility of your herd and the breed is enhanced by the removal of subfertile bulls and their genetics.

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VET CALL

Questions & Answers

Dr. Daryl Funk
From Trans Ova Genetics'
Bovine Bulletin

Q *What type of body condition does a donor need to be in before she enters an Embryo Tansfer (ET) program?*

A Donors that are on the thin side, but have been on a slightly gaining plane of nutrition for the last 60 to 90 days, work best. Donor cows, just like bulls having semen collected, set their primordial zygotes, the immature oocytes which are eggs or immature sperm, in motion 60 days prior to collection. For this reason, cows that are over conditioned or cows that are losing weight may be producing either reduced numbers of usable oocytes or lower quality oocytes during this 60 day pre-flush period.

If you are using a five level body condition scoring system, cows in the 2-3 range work best.

Q *Does a lactating donor work just as well as a dry donor?*

A Lactating cows work just fine but the same conditions apply as in question one. We must supply enough nutrition so that our donor is not losing body condition in the 60 day pre-flush period. Good heat detection is important when working with lactating donors.

Q *How soon can you flush a cow post partum?*

A Some donor cows have flushed successfully as early as 45 to 50 days post partum. To do this, cows need to calve with no problems, their uterus needs to return to normal size quickly and they need to be on a positive plane of nutrition and not losing body condition during the pre-flush period.

Q *How soon can you flush a heifer?*

A Many virgin heifers have made satisfactory embryo donors. My rule of thumb is to start the superovulation process following the third heat period. In some cases we've been able to superovulate heifers as early as 10 months of age. Most heifers work adequately starting at 12 to 13 months of age.

Q *How many flushes can I do consecutively before my donor will decrease in embryo production?*

A As a general rule cows start to lose some of their ability to respond to the FSH drug we use for superovulation after the third consecutive flush. Some cows have been able to keep right on flushing for years of consecutive flushing. A few do not respond to FSH right after their first flush. Unfortunately, we do not have many diagnostic tests we can run to predict how any one donor will respond at a given time.

Q How soon can I breed my donor back for a calf after flushing?

A Experience has taught us that if we give a cow prostaglandin at the time of the flush and inseminate her three days later, twins can result. This happens because there is still FSH present in her system, left from the superovulation process, To avoid this, we recommend short cycling your donor with a second dose of prostaglandin 10 to 15 days after the flush.

A second method is to wait a week after the flush to give prostaglandin and then inseminate.

AJ

Mad Cow Disease Not a Threat In United States

Speculation in the British tabloid press over 'mad cow disease," a degenerative brain disorder that causes cattle to exhibit oddly belligerent behaviors, has triggered questions about whether humans can contract the disease by consuming beef products. A veterinary virologist at Penn State's Animal Diagnostic laboratory says there is no evidence to suggest that the disease can make the jump across species to infect humans.

"There is no epidemiological evidence to suggest this disease in animals is tied to similar diseases in humans," says Anthony Castro, director of the labratory.

Mad cow disease, clinically known as bovine spongiform encepholopathy (BSE), produces the same type of lesion in the brain as three very fare human ailments: Creutzfeldt-Jakob syndorme, kuru and Grstmann-Straussler syndrome. Castro emphasizes that there have been no cases of BSE in the United States since the ailment was first identified in 1996.

'The disease is not genetically inherited, and it is not transmitted horizontally. That means cows can't get it from standing next to another cow," says Castro, who together with Bill Stoffregen, a senior majoring in veterinary science, have just completed an extensive review of BSE. Signs of the disease in cattle include unsteady gaits, excessive salivation, head butting, belligerence and paralysis.

BSE originated in Great Britain. Scientists theorize the disease came from feeding dairy cattle meal and bone meal derived from the carcasses of sheep infected with scrapie, a spongiform encephalopathy which occurs in certain breeds of sheep.

"In the United States, cattle are currently not fed diets derived from sheep carcasses," Castro explains. "In fact, rendering Plants in the United States will not take sheep carcasses to manufacture by-products."

In addition, slides of brain tissue of any cattle that have died exhibiting neurological signs are sent for BSE testing to the National Veterinary Services Laboratory in Ames, Iowa. The U.S. Department of Agriculture also bans the import of cattle and other products derived from cattle from countries where BSE has been diagnosed.

Castro says both scrapie and BSE are found only in the brain and spinal tissue of affected animals. The infectious agent is believed to be an abnormal protein called prion. The protein is extremely resistant to heat and irradiation and no vaccines exist to prevent the disease.

"BSE doesn't pose a threat in the United States but as a precaution, people should not eat cattle or sheep brains, which are products that used to be commonly stacked in some stores," Castro warns. "There is no danger from beef and sheep muscle meats like steak, lamb and mutton."

Although scientists are unsure how the prion protein causes BSE and the rarer human spongiform encephalopathies, Castro says research into these diseases may hold clues as to what causes other neurological diseases such as multiple sclerosis and Parkinson's Disease.

"The evidence is still not all in but BSE is unique to the bovine species and there is no evidence it can be passed to humans," Castro says.

Source: *Pennsylvania State University*