

Venereal Diseases in the Bull

Thomas D. Overbay, DVM
Director, Field Veterinary Services

Fort Dodge Animal Health
43 Green Tree Circle
Bristol, VA 24201

The most significant factor influencing the profitability of cow/calf herds is weaning percentage. Weaning percentage is an annual production parameter determined by dividing the number of calves weaned by the number of cows exposed to the bull. The average weaning percentage for U.S. cattle herds is 70% with the top one-third of herds exceeding 90%. The greatest opportunity increase in income for a cow-calf operation is to increase weaning percentage (1).

Should weaning percentage be less than desired (<90%), there are three general areas that must be examined. Losses of calves can be due to failure to get cows to conceive, loss of the calf during pregnancy to abortion or resorption, death of calves following birth due to disease, predation, etc. or any combination of these three. Improvement in weaning percentage requires that the area(s) of loss be identified and then the specific cause of the loss uncovered.

Venereal diseases in the bull can influence directly two of these areas—failure of cows to conceive and loss of pregnancies through abortion or resorption. By definition, venereal diseases are those diseases that can be spread through natural service. These are usually transmitted by an infected bull mating with susceptible cows. However, an uninfected bull can spread the disease by mating with an infected cow and subsequently breeding a susceptible cow within a short period of time. More unusual cases can occur by the use of infected semen from custom collection of bulls and the failure to test the bull and/or semen for venereal diseases. Use of the same glove to perform vaginal examinations can spread venereal diseases as well.

Causes of Venereal Disease

Venereal disease in cattle can be caused by bacteria, viruses, and protozoal organisms. *Campylobacter fetus* (Vibrio), *Trichomonas fetus*, Bovine Herpes Virus (a form of IBR), *Hemophilus somnus*, ureaplasma, mycoplasma, and Bovine Viral Diarrhea (BVD) are the most commonly recognized causes of venereal disease in cattle.(2) Vibriosis and Trich are only spread by venereal contact. The viruses and bacteria can be spread through other contact with infected animals such as through aerosol spread through the respiratory tract.

Hemophilus, ureaplasma, and mycoplasma are normal inhabitants of the female reproductive tract yet can cause infertility and abortion when introduced into the uterus during breeding. Bulls with these infections generally display no outward signs of infection. It is only when reproductive failure occurs that bulls are identified during trace-back.

Bovine Herpes Virus and BVD are viruses that can be shed to the cow through breeding although spread through aerosols spread via the respiratory tract is more common. This normally occurs during active infection of the bull. While bulls with active herpes virus infections will have lesions or other signs of disease, those with BVD do not. The biggest concern with these viruses is a bull that is persistently infected with BVD and therefore shedding the virus in every ejaculate as well as every other bodily secretion.

The major venereal diseases of cattle are Vibrio and Trich. While Vibrio is caused by a bacteria and Trich is caused by a protozoa, the effects are virtually identical. These organisms “hide” in the crypts of the bull’s penis and cause no outward sign of disease. Once introduced into

the cow, a severe inflammatory disease is initiated with the resultant death of the embryo. There is then a variable recuperative period during which the cow's immune system eliminates the organism and heals. During this time, cows will generally not exhibit estrus leading to a false sense of security on the part of the cattleman and disaster on the part of the calf crop.

Signs of Disease

Unfortunately, there are not many outward signs of venereal diseases. This often leads to the failure to recognize the losses that are on-going until it is too late. Bulls that are infected with organisms responsible for the majority of venereal diseases have few, if any, detectable signs. There are generally no changes to the appearance of the sexual organs, no change in libido, and no changes noticeable in routine semen evaluations.

Despite being a disease that is usually spread by infected males, venereal disease is usually detected by abnormalities in the cows. The primary sign is a high percentage of open cows, particularly first calf heifers. Heifers are more likely to be open because they lack the natural immunity of the older cows because they have had less exposure to the disease. In addition to open cows, it is not uncommon to find that the breeding season has been extended as evidenced by wide variations in pregnancy dates or extended calving seasons.

The disruption in reproduction caused by venereal disease is largely due to the immune status of the cow. Cows that have been previously infected will become infected in subsequent seasons but the duration of the infection is usually reduced as is the severity of disease. The net result is that the calf crop is extremely variable with calves several weeks or months old standing along newborns.

Herds may also have a number of cows that fail to conceive or calve. This may be due to the

removal of bulls prior to the recovery of the cow's reproductive tract. Reproductive failure may also be due to severe damage to the lining of the uterus resulting in pyometra (pus in the uterus) or endometritis.

A frequently overlooked effect of venereal disease is abortion. Though correctly assumed to be a cause of infertility, it is not uncommon to experience fetal losses that are quite severe even after the cow has been diagnosed pregnant by rectal palpation. In the author's experience, pregnancy loss in excess of 3% call for examination into the possibility of infected bulls within the herd.

Diagnosis of Venereal Disease

There is no easy way to diagnose the presence or absence of venereal disease in bulls. Except for BVD, there is no blood test for these organisms that is reliable. Use of Breeding Soundness Exams is also of limited value as the organisms responsible seldom cause any changes to the physical appearance of the sexual organs. Semen evaluation is also typically normal as the organisms are found on the surface of the penis and prepuce not in the semen itself.

Reliable diagnosis requires serial scraping of the prepuce with an infusion pipette. The bull should be sexually rested for at least two weeks to allow for the organisms to increase in number. Proper sampling technique is important as is the handling of the samples. Even under the best of circumstances, the bull should be sampled weekly for three weeks before being declared free of disease.

Control of Venereal Disease

Prevention of venereal diseases, like all diseases, is largely dependent upon the

management of the herd. It requires use of a number of practices in a program where a lapse in one aspect will limit the effectiveness of the other components.

Venereal diseases are only spread by the mating of an infected animal to a non-infected animal. Therefore, the absence of infected animals will prevent venereal disease from affecting the herd. Maintaining a closed herd is perhaps more challenging than we realize. The introduction of herd bulls is most likely to introduce venereal diseases into a herd. Ideally, only virgin bulls should be brought into the herd. All new bulls, including “virgin” bulls, should be tested for venereal diseases and the testing should be complete as a single test will miss most infected animals.

The bull battery should be kept as young as possible as younger bulls are less likely to become long term carriers of venereal diseases. Bulls less than 4 years of age have fewer and more shallow crypts in their penises making establishment of infection less likely. All bulls should be tested annually prior to the breeding season and all positive bulls should be culled. Complete testing, especially for Trichomoniasis, requires three samplings at one week intervals. A bull declared negative only after all three tests should be considered free of venereal disease.

Because venereal diseases are usually spread through natural service, the use of artificial service is an effective control measure. Semen from reputable suppliers is tested to be free of these diseases---steps should be taken in custom collection to assure semen from these sources to be safe as well. The biggest obstacle to use of AI in beef herds has been heat detection and synchronization. New knowledge of ovarian activity has led to programs such as OvSynch which enhances the usefulness of AI to the beef producer.

The maintenance of a “clean” cow herd can be equally challenging. The most effective technique to cow management is pregnancy testing. All open cows should be culled. In herds with extended breeding seasons, consideration may also be given to culling cows that conceived late in the breeding season. Use of a short breeding season will aid in identification of subfertile cows thus helping to remove infected cows as well as selecting for fertility. Removing open cows is not a guarantee as carrier cows can exist within a herd and these animals successfully conceive and carry to term yet remain a source of infection for the rest of the herd.

One of the challenges of a closed herd is pasture management, or more specifically, fence management. All the efforts to maintain a disease free herd can be defeated by the accidental introduction of outside animals during the breeding season. Diseases thought to only be associated with open grazing have been found to be quite common in traditional grazing operations because of the “free” movement of animals between herds.

An important aspect of the control of venereal diseases is vaccination. A vaccination program should be in place for all herds that is comprehensive for all diseases that exist within the herd or that may become a problem. Effective vaccines are available for BVD, IBR, Vibrio, and Trichomoniasis. In order to get the optimum use of these vaccines, the timing of their administration is critical. Vibrio and Trich vaccines are most effective when used immediately prior to the breeding season. While this may be less than ideal for some management schemes, the return to the cattleman in terms of the number of calves and the increase in weaning weights from early calving more than make up for any additional handling.

The type of vaccine used is equally important. In order to get the desired effect, it is critical that vibrio and Trich vaccines be in an oil adjuvant.

The use of an oil adjuvant stimulates an immune response that is greater and of much longer duration than those vaccines that are non-oil adjuvanted. To expect protection throughout the breeding season, only oil adjuvanted products should be used.

The vaccination program should be applied to both bulls and cows. Vibrio, IBR, and BVD vaccines have been shown to be effective in bulls. Vaccine quality is again an issue as bulls need a Vibrio vaccine with a high amount of Vibrio organisms per dose in order to stimulate an effective immune response (3). Trich vaccines can be safely given to bulls but the degree of benefit is questionable.

With vaccination it is important to remember certain facts about the immune system and how vaccines work. No vaccine will prevent infection, they only prevent the disease from having its most devastating effects. Vaccines should be used as part of a total control program, not in place of one, and should be given before a disease outbreak not during one. Proper use of Trich and Vibrio vaccines are an effective and economical tool in the control of venereal diseases.

Treatment of Venereal Disease

There are no treatments available for the

treatment of venereal diseases in bulls or cows. Treatments that were previously utilized are no longer available. Not only are they not approved, the use of these compounds in cattle is illegal.

Summary

Venereal disease in cattle costs the cattle industry hundreds of billions of dollars annually. Yet, the use of effective control measures including bull management and vaccination offer cattlemen reliable, cost effective controls.

In order to maximize the weaning percentage to get the optimum profitability out of cow/calf operations, cattlemen must work with their animal health experts to design programs tailored to their management. The returns are most certainly worth the effort.

References

- Lichtenwalter, Richard, Eastern North Carolina Extension Beef Specialist, Personal Communication.
- BonDurant, RH. Pathogenesis, Diagnosis, and Management of Trichomoniasis in Cattle, *Veterinary Clinics North America Food Animal Practice* 2:350, 1997
- Vasquez, LA, et al. Bovine Genital Campylobacteriosis (Vibriosis): Vaccination of experimentally infected bulls, *American Journal of Veterinary Research*. 44:1553-1557, 1983

NOTES:

NOTES: