DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

Agriculture and Natural Resources

FSA3125

Livestock Health Series

Reproductive Diseases of Beef Cattle

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Reproductive disease such as infertility and abortion can lead to major economic losses for beef cattle operations. There are many potential causes that lead to reproductive disease in cattle, but the majority of the problems are typically due to a handful of pathogens.

Leptospirosis (Lepto)

Leptospirosis is a disease that can affect several species including cattle, sheep, pigs, dogs, horses, wildlife and man. This disease is caused by bacteria that are well suited for wet, moist environments. Cattle can be exposed from contaminated stock ponds, wildlife, rodents or infected domestic animals. Transmission can occur when the bacteria penetrate a mucous membrane (mouth, nose, conjunctiva, genital tract) or enter an open wound. Once an animal is infected, the organism circulates throughout the body and localizes in the kidneys, mammary glands and genital tract. When the urogenital tract becomes infected, the bacteria can be shed in urine, uterine discharge, semen and aborted fetuses/placentas. This shedding allows other herd mates to become exposed and infected.

Leptospirosis may lead to many reproductive problems such as infertility, early embryonic death, late-term abortions, weak newborn calves and low-grade uterine infections. Late-term abortions due to leptospirosis typically occur in the second or third trimester of gestation. Cows may not abort the fetus when they first contract the disease, and infected cows frequently exhibit no other signs of illness. If cows are affected very late in gestation, they may give birth to weak or poorly developed calves.

*Figure 1. Aborted bovine fetus.

Leptospirosis can survive in a moist environment for an extended period of time. Standing water and runoff water could be sources of infection for a cow herd and should be managed to prevent contamination. Rodents and other wildlife can carry leptospirosis; therefore, controlling and giving rodents and wildlife limited exposure to cattle will help prevent the transfer of disease.

Infectious Bovine Rhinotracheitis (IBR, Red-Nose)

IBR can lead to several forms of clinical disease. The IBR virus can cause symptoms that range from respiratory tract infections, ocular infections, abortions, genital infections and neurological infections to a generalized infection of newborn calves.

IBR hinders reproduction by its effects on the ovaries, uterus and

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developing pregnancy. Depending on when the infection occurs during gestation, it can result in early embryonic death and infertility, or IBR infection can result in late-term abortion (five to nine months of gestation). Cows aborting due to an IBR infection may experience temporary infertility from vaginitis after the abortion. Unvaccinated herds are at the highest risk for IBR abortion problems.

There are some safety concerns when vaccinating pregnant cows with a modified-live virus (MLV) IBR vaccine. Pregnancy losses can occur if an MLV vaccine is administered to naïve pregnant cows. Recently, some manufacturers have produced MLV vaccines labeled for use in pregnant animals; however, these vaccine labels plainly state that the MLV vaccine must be administered previously before it is given to a cow that has become pregnant. Therefore, strict adherence to the manufacturer's recommendation is a must when using MLV vaccine in pregnant cattle.

Bovine Viral Diarrhea (BVD)

BVD virus can cause a wide variety of clinical syndromes in cattle including infertility, respiratory disease (pneumonia), congenital abnormalities (eye defects, brain defects), abortion and stillbirths. If a pregnant cow acquires a BVD infection, there are several possible outcomes depending on the stage of pregnancy at which infection occurs. Early gestation infection results in low conception rates due to early embryonic death. However, an infection during mid-pregnancy (40 to 125 days) can result in more detrimental outcomes. During this time period, possible outcomes of an infection can result in a persistently infected calf. A persistent infection occurs when the calf has incorporated the virus into its body and sheds high levels of the virus throughout its entire lifetime. Infections during later pregnancy (>180 days) may result in a normal calf or the calf could be born with congenital defects. These defects may include poor brain development, eye abnormalities, structural malformations and stunted growth. Calves born with congenital defects usually have difficulty standing and walking and may exhibit an early death due to a poor ability to nurse the dam.

Vibriosis (*Campylobacter fetus*)

Vibriosis is caused by bacteria called *Campylobacter* which can infect the reproductive tract of both male and female cattle. It typically causes infertility during the breeding season due to loss of early pregnancies. Characteristic clinical signs of this disease include a high percentage of cows in the herd returning to estrus (heat), decreased pregnancy rates and an extended breeding season. Affected cattle may also show prolonged or irregular estrus periods. During the calving season, many cows will be calving later in the season due to the repeated breeding caused by the infection. Infrequently, cows may abort between four and eight months when infected with *Campylobacter*, but these occurrences are rare.

Campylobacter typically survives in the reproductive tract of an infected bull where it can be found within the lining of the sheath and penis. The infected bull will pass the bacteria to cows via sexual contact. This leads to inflammation in the cow's reproductive tract that can result in reproductive failure. Once a cow becomes infected, she will clear the infection after several weeks; however, during that time period, she acts as a source to pass the infection on to other herd bulls that breed her. Younger bulls infected with vibriosis may be able to clear the infection, but older infected bulls (four years and older) tend to carry the infection the rest of their lives. Vaccination for vibriosis has been effective in controlling the disease.

Brucellosis (Bang' disease)

Brucellosis is caused by a bacterial infection that infects the reproductive tracts of cows and bulls. Brucellosis can lead to abortion in pregnant cows. Once a cow aborts from this disease, the organism is very prevalent within the aborted fetal tissues, placental membrane and placental fluids. Susceptible animals can be exposed to the pathogen from these sources, or transmission can occur by direct contact between an infected animal to a susceptible animal. Cows infected with the disease seldom abort more than once; however, calves born in later pregnancies may be weak and in poor health. Once a cow becomes infected, she will likely harbor the infection for life and intermittently shed the bacteria and expose others in her environment.

***Figure 2. Late-term abortion.**

The primary reason for the national eradication program for brucellosis is that the disease is transmissible to humans. This disease is referred to as undulant fever in humans and leads to flu-like symptoms. In the past, the disease was an occupational hazard for veterinarians, cattlemen and packing house workers.

Since 1997, Arkansas had been classified free of brucellosis. However, in light of the recent outbreaks in other states, the importance of preventing this disease has been reestablished. Producers should strongly consider a preventative vaccine for their replacement heifers. Replacement heifers must be vaccinated by a veterinarian or state technician for brucellosis between four and twelve months of age.

Trichomoniasis (Trich)

Trichomoniasis is a venereal disease of cattle caused by a protozoa organism, *Tritrichomonas foetus*. This disease causes very few outward signs of illness. Therefore, it can often be present in a herd for a considerable time before it is suspected and diagnosed. Infected cows will experience infertility and early embryonic death, causing the cow to return to heat and subsequently leading to poor pregnancy rates and extending the breeding season. This in turn causes devastating losses due to reduced calf crops and prolonged calving seasons.

Trichomoniasis has few adverse effects in the bull, but the bull acts as the main source of transmission for the herd. In bulls, the organism lives on the tissue lining of the penis and preputial sheath. Once infected, bulls (especially bulls over four years of age) often stay infected for life. Once a cow is infected, she will usually overcome the infection within 90 days. Infected cows may display a thick, yellowish vaginal discharge while infected, but in many cases no outward signs may be apparent in infected cows.

Vaccines are available to aid in the control and prevention of this disease. Vaccination requires two injections, typically administered two to four weeks apart. Consult with your veterinarian before starting a trichomoniasis vaccination program for your herd.

Neosporosis

Neospora caninum is a protozoan that can infect cows and lead to abortion. Abortion caused by this pathogen generally occurs between the fourth and seventh month of gestation. If infected cows do not abort their fetuses, they may pass on the infection to their newborn calves. This is referred to as a congenital infection. Once grown, congenitally infected cows outwardly appear to be healthy, but up to 20 percent can abort a calf at least once during their lifetime.

Historically, this disease has been a problem in dairies but is now a growing problem in beef cattle. The definitive hosts for this disease are canines; therefore, dogs, coyotes and wolves may harbor the pathogen and shed it in their feces, leading to cattle being exposed. After infection occurs in a dog, it sheds the pathogen for approximately three weeks. However, the infective stages may lay dormant in the environment for several months, allowing cattle to become exposed during that period of time. Treatment success for infections has been limited. Therefore, the best control method is to utilize a vaccination program or to limit the exposure of pregnant cattle to infected intermediate hosts.

Other Reproductive Diseases

Aspergillus sp. is a fungal cause of abortion in cattle. It can be inhaled or consumed from moldy feed or hay. Once it enters the pregnant cow's body, the placenta is affected and abortion can occur during the second and third trimester. Increased incidence of *Aspergillus* may be seen during winter months on animals that are housed indoors.

There are many other potential causes of abortion in cattle other than diseases. Various toxins, nitrates from certain forages or from a water source and plants such as broomweed, locoweed or pine needles can also lead to abortion. Pregnant cows can also abort due trauma or injury as well as heat stress.

Diagnosing the Problem

Diagnosing the cause of abortion is somewhat trying, and results can be inconclusive greater than 50 percent of the time. When submitting tissues to a diagnostic laboratory, careful handling of the submitted sample(s) is essential. Always refrigerate samples as soon as possible to prevent further breakdown of tissue. When submitting samples to a diagnostic laboratory, include the fetus, the placenta and a maternal blood sample. Some diseases that cause abortion in cattle can also infect humans, so always be cautious when handling aborted fetuses and tissue. If you do not plan to use the tissues for diagnostic purposes, dispose of them so that other animals in the herd do not become exposed from these contaminants.

The chart below provides an estimate of age for an aborted fetus:

Length of gestation	Description of fetus
Two months	Size of mouse
Three months	Size of rat
Four months	Size of small cat
Five months	Size of large cat
Six months	Size of small dog (hair around eyes, tail, muzzle)
Seven months	Fine hair on body and legs
Eight months	Hair coat complete, incisor teeth slightly erupted
Nine months	Incisor teeth erupted

*Table modified from New Mexico State University Cooperative Extension Service publication B-215

Preventing the Problem

Although herd health needs may vary between operations, there are a few standard vaccines that should be included to prevent problems with reproductive diseases in your herd. Vaccinate annually with:

- 5-way viral vaccine (IBR, BVD, PI-3, BRSV)
- 5-way leptospirosis vaccine
- Vibriosis vaccine
- Vaccinate 30 days prior to the breeding season
- Vaccinate replacement heifers for Bang's between four and twelve months of age

Since vaccination needs may vary, it is important to get your veterinarian's input when selecting vaccines for your operation. For more information on reproductive diseases and other cattle diseases, contact your county Extension office.

*Pictures provided by Dr. Steve Breeding, University of Arkansas Veterinary Diagnostic Laboratory Director

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FSA3125-PD-12-13RV