

Abortion and loss of pregnancy in beef cattle can occur for a variety of reasons. Many times the reason for the loss is complex and difficult to diagnose. This guide will briefly outline and discuss some of the more common diseases and causes of loss of pregnancy. If a loss of pregnancy is suspected, contact your local veterinarian for assistance and advice for diagnosis and control of the causative agent in the pregnancy loss. The following are some helpful steps to take when an abortion is identified.

CAUTION: Many diseases that cause abortion in cattle are caused by pathogens that can cause disease in people. Follow good biosecurity measures and use personal protective equipment such as latex gloves and a mask when handling the aborted fetus and materials. Use disinfectant soap when washing after handling aborted materials.

1. Contact your local veterinarian.
2. Identify and isolate the aborting cows from the rest of the herd if possible; this may help prevent the spread of the disease and makes the cows available for sample collection.
3. Save the aborted fetus and placenta by placing them in a plastic trash bag and refrigerating. If fetus and/or placenta are frozen when found, keep frozen until submitting to a veterinary diagnostic laboratory. Do not wash the fetus or placenta.
4. Record all herd health practices, such as vaccinations used, date, and route of administration;

movement of cattle; origin of new cattle and bulls brought into the herd; results of semen evaluations; and diagnostic test results on bulls.

5. Keep a reproductive history on your cow herd, including conception rate, calving rate, weaning rate, and dates when bulls are exposed to cows.

BOVINE VIRUS DIARRHEA

Bovine virus diarrhea (BVD) is a viral disease caused by a pestivirus with many syndromes. For this guide, only the abortion syndrome will be discussed. The pregnancy loss associated with BVD is dependent on when in gestation the dam is exposed to the virus. Embryonic infection in the first trimester can result in fetal reabsorption, mummification, or abortion, or can have no effect. Calves can become persistently infected (PI) if exposed to the virus during the first 120 days of gestation. These PI calves shed the virus in body fluids for life and are a great biosecurity risk to the cow herd. Cattle that are exposed in the second trimester of gestation may abort, deliver a live calf that has congenital defects that affect the brain and eye, deliver a weak or stillborn calf, or deliver a normal calf. Exposure in the third trimester may result in a calf that is stillborn, live but weak, or normal. Late-term abortions with BVD are uncommon but do occur. Exposure to BVD virus can result in abortion storms when acute infections occur.

¹Respectively, Extension Veterinarian, Department of Extension Animal Sciences and Natural Resources; and Associate Professor, Southwest Border Food Safety and Defense Center, both of New Mexico State University.

Diagnosis of BVD infections can be difficult and may require multiple sample submissions to accurately diagnose the presence of infection. Blood samples, ear notch samples, and examination of aborted fetuses may all provide information that is helpful in the diagnosis of BVD virus infection. Your veterinarian will need to help you evaluate the laboratory results obtained from sample submission due to the complex nature of this disease.

Bovine virus diarrhea is a common viral pathogen and has widespread distribution throughout the U.S. Control of BVD infection is only accomplished through prevention. Good biosecurity practices, isolating incoming cattle, testing for PI cattle, and developing a good vaccination program that includes properly using modified live vaccines (MLVs) are all components of a BVD prevention program. Preventing the introduction of the virus onto your premises is the key component of a BVD control program.

BRUCELLOSIS (BANG'S DISEASE)

Brucellosis was once a devastating disease that was very common in the U.S. A federal eradication program, conducted by the USDA, to eliminate the disease in cattle has been very successful, and cattle brucellosis is now limited to the greater Yellowstone area. The disease in cattle is caused by the bacterium *Brucella abortus*, resulting in abortion in cows and infertility in bulls, and is a zoonotic disease that can cause undulant fever in humans. The bacterium can be present in fetal fluids, milk, and semen. Many strains of brucellosis are present in the U.S., and multiple species of animals are affected, such as cattle, sheep, goats, swine, dogs, and wildlife, with some cross-species contamination occurring.

A high rate of abortion may occur in susceptible herds. The occurrence of abortion is dependent on when in gestation the dam is exposed to the bacterium. Cows infected at service abort after an average of 225 days, whereas those infected at seven months of gestation abort about 50 days later. In fully susceptible herds, abortion rates vary from 30 to 70 percent, but may be lower in chronically infected herds. Weak, full-term calves that die shortly after birth are sometimes seen. Bulls that are exposed to the disease or vaccine may develop inflammation of the testicles or seminal vesicles, resulting in infertility.

Many tests are available to help diagnose brucellosis. Sample submission may include the fetus, membranes, and blood from the dam. This disease is easily transmitted to humans, and the use of personal protective equipment is highly recommended. The disease can be controlled with good biosecurity practices and vaccination of females less than twelve months of age. Vaccination for brucellosis may only be performed by a licensed, accredited veterinarian. Some states require a negative test before cattle are allowed to enter the state.

CAMPYLOBACTERIOSIS (VIBRIOSIS)

Campylobacteriosis is an abortion disease caused by the bacteria *Campylobacter fetus* subsp. *venerealis* and *C. fetus* subsp. *fetus*. These organisms can affect cattle, sheep, and humans. *Campylobacter fetus* subsp. *venerealis* is strictly a venereal disease spread through breeding. The disease caused by this species of *Campylobacter* is characterized by endometritis (inflammation of the lining of the uterus) that results in early embryonic death, prolonged estrus cycles, delayed conception, reduced fertility, and (rarely) abortion. The infection is usually self-limiting, and most cows recover in three to five months. Up to ten percent of infected females may become chronic carriers of the disease and harbor the infection until the next breeding season. Some females may be rendered permanently sterile as a result of having the infection. This loss of pregnancy is usually early in gestation, with no outward clinical signs seen in the female. In the bull, the infection can localize on the surface of the penis and prepuce, which can result in prolonged survival of the organism being carried by the bull.

Campylobacter fetus subsp. *fetus* may be spread venereally or by ingestion of the organism in feed contaminated with fecal material. The organism may be absorbed from the intestine into the bloodstream where it gains access to the reproductive tract. Either route of exposure may result in sporadic mid- to late-term abortions.

Laboratory diagnosis of the disease is very difficult and centers on isolating the organism in aborted materials from the cow and preputial scrapings from the bull. Fresh and properly handled diagnostic specimens are needed to isolate the organism. Often the diagnosis of vibriosis is made by ruling out other causes of reproductive

loss. Prevention and control of Campylobacteriosis includes vaccination, culling infertile cows and infected bulls, purchasing replacement animals from herds with no history of the disease, and good biosecurity practices.

INFECTIOUS BOVINE RHINOTRACHEITIS

Infectious bovine rhinotracheitis (IBR) is caused by a herpesvirus that is widely distributed in the U.S. This virus is a component of the “shipping fever complex” that can cause severe respiratory disease and death. Exposure to the virus from a single infected animal may result in widespread disease due to the highly contagious nature of this virus. Some animals may become chronic carriers of the virus and will shed the organism during times of stress. Natural transmission occurs by direct contact with droplets containing virus particles spread by nasal secretions or semen, or through breeding.

Abortions from IBR may occur as long as 90 days after infection, with most abortions occurring after the fifth month of gestation. The fetus is dead when expelled and may require manual removal. A retained placenta is a common result of IBR abortion. The rate of abortion may be very high in a susceptible herd. An abortion storm may result without prior clinical signs.

Laboratory diagnosis of IBR infection is based on isolation of the organism in an aborted fetus or fetal membranes, or with serologic testing on the aborting dam. Multiple serum samples may be required to diagnose the disease.

Prevention and control of IBR infection centers around preventing exposure to the virus and sound vaccination practices. Improper use of MLVs may result in abortions; therefore, MLVs should be used under the direction of your veterinarian. Research has shown that properly used MLVs are the most effective tool in preventing viral infection. Good biosecurity practices, such as isolating new additions to the herd or isolating animals with clinical signs that include respiratory disease or abortion, are also important for preventing and controlling IBR and many other diseases.

LEPTOSPIROSIS (LEPTO)

Leptospirosis is a disease caused by spirochetes (a type of bacteria) of the genus *Leptospira*. In cattle,

many different symptoms, including abortion, stillborn, and reproductive failure, may result from *Leptospira* infection. There are many different species of *Leptospira* widely distributed throughout the U.S. Several species have distinct strains, or serovars, that have different antigens. In cattle, the species of importance are *L. hardjo*, *L. canicola*, *L. icterohaemorrhagiae*, *L. pomona*, and *L. grippityphosa*. The disease is transmitted venereally, across the placenta, through breaks in the skin, or is absorbed across mucus membranes. A common route of infection for livestock is by ingesting water contaminated with infected urine excreted by wildlife. There is an increase in human cases of Leptospirosis due to contact with infected livestock.

The disease can cause abortions, infertility, mastitis, or weak or stillborn calves. Low conception rates are a common finding in a herd with Lepto. Severe abortion storms of late-term pregnancies may be seen when susceptible herds are exposed to the organism. This organism has an affinity for the urinary tract and may be present in urine even when no clinical signs are seen. Kidney infections with *Leptospira* may be mild to severe, with death being possible. Urine from an infected animal is a risk to other animals and humans.

Laboratory diagnosis of Leptospirosis is based on isolation of the organism by culturing organs from an aborted fetus or fetal membranes, by paired serum samples on the aborting dam, or by multiple other laboratory methods of identifying the organism.

Prevention and control of this disease includes vaccination, good biosecurity practices such as isolating animals that have aborted, and limiting exposure to rodents and wildlife. The response to treatment of this disease using antibiotics is variable depending on the species of *Leptospira* involved and the severity of clinical disease.

TRICHOMONIASIS (TRICH)

Trichomoniasis in cattle is a strict venereal disease caused by the protozoa *Tritrichomonas fetus* and has widespread distribution in the western U.S. This is an economically devastating disease due to the large reproductive loss. The bull is a mechanical spreader of the organism, and no treatment for the bull is available.

The disease is characterized by an increase in open cows at pregnancy detection, decreased weaning weights, and a prolonged calving season. Generally, no other clinical signs are seen. Cows contract the disease by being bred by an infected bull. The organism enters the reproductive tract and usually causes a loss of pregnancy early in gestation. The cow will develop an immune response, cycle three to five times, and usually clear the infection and settle several months after contracting the disease. While the cow is mounting the immune response, she can infect any bull that breeds her. Two to three percent of infected cows may become carrier cows and harbor the disease for a prolonged period of time. Some cows develop an infected pus-filled uterus that may be detected during palpation for pregnancy.

The bull is a mechanical spreader of the organism. He contracts the disease by breeding an infected cow. The organism lives on the surface of the reproductive tract of the bull and causes no immune response. In older bulls, the prepuce and penis have more crypts or fissures in the surface and therefore harbor the organism more easily than younger bulls; however, bulls as young as one year of age have been shown to be chronically infected. There is no treatment for infected bulls, and once diagnosed as positive they should be sold for slaughter as soon as possible.

Laboratory diagnosis is based on detection of the DNA of the Trich organism. Diagnosis of the disease in cows is very difficult and rarely attempted;

therefore, samples obtained from preputial scrapings of bulls are submitted for diagnosis.

Prevention and control of Trichomoniasis includes a defined breeding season, monitoring of pregnancy rates, annual testing of bulls, vaccination of susceptible cows, and good biosecurity practices such as purchasing replacement cattle from known Trich-negative herds. Trichomoniasis is a reportable disease in New Mexico, and testing for Trich can only be performed by veterinarians certified by the New Mexico Livestock Board.

REFERENCE

Coetzer, J.A.W., and R.C. Tustin (Eds). 2005. *Infectious diseases of livestock*, 2nd ed. Oxford, UK: Oxford University Press.



John C. Wenzel is the Extension veterinarian in the Extension Animal Sciences and Natural Resources department at NMSU. He earned his B.S. from NMSU and his DVM from Kansas State University College of Veterinary Medicine. His work focuses on cow/calf medicine and preventative health programs for livestock producers in southwestern New Mexico.

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