Reproductive Loss in Beef Cattle

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 for loss of pregnancy. If a loss of pregnancy is suspected, contact your local veterinarian for assistance and advice for the diagnosis and control of the causative agent in the pregnancy loss. Below are some helpful hints when an abortion is identified.

CAUTION: Many of the 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 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, as this may help prevent the spread of the disease and makes them available for sample collection.
3. Save the aborted fetus and placenta by placing materials in a plastic trash bag and refrigerating. If fetus and/or placenta are frozen when found, keep frozen until submission to a veterinary diagnostic laboratory. Do not wash the fetus or placenta.
4. Record all herd health practices, such as vaccinations used, date, route of administration, movement of cattle, origin of new cattle and bulls brought into herd, results of semen evaluations and diagnostic test results on bulls.
5. Keep a reproductive history on your cowherd including conception rate, calving rate, weaning rate and dates when bulls are exposed to cows.

Bovine Virus Diarrhea (BVD)

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 exposure to the virus occurs. Embryonic infection in the first trimester can result in fetal reabsorption, mummification, abortion or have no effect. Persistently infected (PI) calves can result from exposure to the virus during the first 120 days of gestation. PI calves shed the virus in body fluids for life and are a great biosecurity risk to the cowherd. 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 stillborn, live weak
calf or a normal calf. Late term abortions with BVD are uncommon but do occur\(^1\). BVD virus exposure can result in abortion storms when acute infections occur.

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.

BVD is a common viral pathogen and has widespread distribution throughout the US. Control of BVD infection is only accomplished through prevention. Good biosecurity practices, isolation of incoming cattle, testing for persistently infected cattle and developing a good vaccination program that includes properly using modified- live vaccines are all components of a BVD prevention program. Preventing the introduction of the virus onto your premise is the key component of a BVD control program.

**Brucellosis (Bangs Disease)**

Brucellosis was once a devastating disease that was very common in the US. A federal eradication program to eliminate the disease in cattle conducted by the United States Department of Agriculture has been very successful resulting in cattle brucellosis being limited to the greater Yellowstone area. The disease in cattle is caused by a bacterium **Brucella abortus** resulting in abortion in cows and infertility in bulls, and is a zoonotic disease causing undulant fever in humans. The bacterium can be present in fetal fluids, milk and semen. Many strains of brucellosis are present in the US and multiple species of animals are affected such as cattle, sheep, goats, swine, dogs and wildlife.

A high rate of abortion may occur in susceptible herds. The occurrence of abortion is dependent on when in gestation exposure to the bacteria occurs. 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- 70 percent, but may be less 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 an orchitis or epididymitis resulting in infertility\(^2\).

Many tests are available to aid in the diagnosis of 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. Control of this disease is through 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 negative testing prior to entry.
**Campylobacterosis (Vibriosis)**

Campylobacterosis is an abortion disease caused by the bacteria *Campylobacter fetus subsp. venerealis* and *Campylobacter fetus subsp. fetus*. These organisms can affect cattle, sheep and humans. *C. fetus subsp. venerealis* is strictly a venereal disease spread through breeding. The disease caused by this species of campylobacter is characterized by an endometritis or 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.3

*C. 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 (IBR)**

IBR is caused by a herpesvirus that is widely distributed over the US. 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 that shed the organism during times of stress. Natural transmission occurs by direct contact with droplets containing virus particles spread by nasal secretions, 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 sequel to 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, 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 modified-live vaccine may result in abortions therefore the use of modified-live vaccines should be under the direction of your veterinarian. Research has shown that properly used modified-live vaccines are the most effective tool in preventing viral infection. Good biosecurity practices such as isolating animals with clinical signs that include respiratory disease or abortion. Isolation of new additions to the herd is important for IBR and many other diseases.

**Leptospirosis (Lepto)**

Leptospirosis is a disease caused by spirochetes of the genus *Leptospira*. In cattle, many different syndromes including abortion, stillborn and reproductive failure may result from Leptospira infection. There are many different species of Leptospira widely distributed throughout the United States. Several species have distinct strains, or serovars, that are antigenically different from each other. In cattle the species of importance are *L. hardjo*, *L. cannicola*, *L. icterohemorragica*, *L. pomona* and *L. grippotyphosa*. The disease is transmitted venereally, across the placenta, breaks in the skin or 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, 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 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, 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 include 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 *Trichomoniasis fetus* and has widespread distribution in the western United States. 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 easier 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.

**References:**

1. Infectious Diseases of Livestock, 2nd Ed. Coetzer, J.A.W. and Tustin, R.C. Bovine Viral Diarrhoea and Mucosal Disease, pg 946-962.

SOUTHWEST BEEF SYMPOSIUM

The seventh annual Southwest Beef Symposium jointly hosted by the New Mexico State University Cooperative Extension Service and Texas AgriLife Extension Service is scheduled for Tuesday and Wednesday, Jan. 18-19 in the Grand Plaza Room of the Amarillo Civic Center, 401 S. Buchanan St. in Amarillo, TX. Attached is a schedule of the program and registration form. This information, hotel accommodations, and online registration are available on the SWBS website at http://swbs.nmsu.edu. If you should have any questions, please feel free to contact Manny Encinas at (505)927-7935, email mencina@nmsu.edu.

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From our office to yours – WE WISH YOU A MERRY CHRISTMAS AND A PROSPEROUS NEW YEAR – 2011.