

## **ABORTION DISEASES OF RANGE CATTLE**

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Diagnostic success rates of only 25–30% attained by diagnostic laboratories around the world verifies the fact that determining the cause of abortion in cattle can be difficult. Abortion frequently results from an event that occurred weeks or even months earlier and the cause, if it ever was in the fetus, is probably undetectable at the time of abortion. Further, if the fetus remains in the uterus for any length of time after death, postmortem degeneration will hide lesions. Fetal membranes, which are most often first and most consistently affected are frequently unavailable for examination. Toxic and genetic factors causing fetal death and/or abortion are not discernible in the specimens available for examination and finally, many causes of bovine abortion are unknown or there are no useful diagnostic procedures for their identification.

Some of the disease entities causing bovine abortion will be briefly discussed with the idea of giving the reader an overview of abortion disease; what the veterinary practitioner would call a “differential diagnosis”.

### **BACTERIAL DISEASES**

#### Brucellosis

Abortions occur after the 5th month of pregnancy. Retained placenta and residual infection of the uterus are often indicators of the disease. The fetus has

undergone a good deal of decomposition because it is usually retained in–utero for 1–3 days after death.

The diagnosis depends on the isolation of the *Brucella* bacterium from the fetal tissues and membranes, uterine exudate and blood testing of the dam.

#### Campylobacteriosis

Herds infected with *Campylobacter fetus* spp. *venerealis*, in which abortions occur, will have a history of infertility and repeat–breeding. If the infection has been present for several years, infertility will be more common in heifers, because many of the mature cows will have developed immunity. Abortions commonly occur between the 4th and 8th month of gestation, and expelled fetuses are usually fresh. Vaccines are available and their use has reduced the prevalence of this disease in cattle.

#### Corynebacterium Pyogenes

This bacterium is most frequently recovered from ruminants and is often involved in sporadic infections of the reproductive system of both sexes. It is one of the most common causes of sporadic abortion in cattle and causes abortion less commonly in sheep and swine. Abortions can occur at most any stage of gestation. Infection of the placenta is a consistent finding and is thought to result from spread of the organism by hematogenous (blood) route to the uterus. The organism can infect the fetus transplacentally and cause a septicemia.

Isolation of the organism from placental and fetal tissues as well as observing microscopic tissue lesions will provide a diagnosis.

#### Leptospirosis

In cattle, leptospirosis may cause fever, anemia, icterus and wine–colored urine.

However, in most cases, abortion occurs most commonly during the last trimester without any obvious symptoms in the cow. The fetus may be retained up to 3 days after death, however calves have been born alive, weak and die soon after. This is another disease where vaccination is routinely practiced and is effective.

### Chlamydiosis

Chlamydial infections can produce abortion, stillbirths, or the birth of weak calves. For the most part, abortions occur very sporadically in cattle; this disease is more important as a cause of abortion in sheep. These infections can occasionally produce significant numbers of abortions in late pregnancy, particularly following inclement weather or other patterns of stress.

## **FUNGAL DISEASE**

### Mycotic Abortion

Abortions are typically sporadic, and occur from 4 months to term. The incidence, in cold climates, is highest in the winter months. Severe infection of the placenta, characterized by a leathery thickening of the areas in between the cotyledons, is a common finding. In about 25% of the cases the fungus invades the fetus and red or white ringworm-like lesions can be seen in the fetal skin.

Leathery, thickened placental tissue is observed in both Brucella and Campylobacter abortion, but in neither case is the thickening as severe as with mycotic infection.

## **VIRUS DISEASES**

### Infectious Bovine Rhinotracheitis

IBR virus can cause a number of disease manifestations in cattle including "Red

Nose", Infectious Pustulo-vulvovaginitis, Conjunctivitis, Septicemia in Calves, and Abortion. Symptoms of any of these conditions may or may not be present in the herd when abortions due to the virus infection result. Abortions occur from 4 months gestation to term, and the fetuses have been dead 2 or more days prior to expulsion and can be even partially or completely mummified.

### Bovine Virus Diarrhea

BVD virus infection usually results in a subclinical to mild disease, undetected in most affected herds. The mild disease is characterized by anorexia, respiratory distress, and diarrhea. The pregnant cow is seldom clinically ill with acute BVD infection but the embryo or fetus can be severely affected. In the first month of gestation, infection can result in death and resorption of the embryo. From the 2nd to 4th month, growth retardation, central nervous system malformations, alopecia, mummification and/or abortion can occur. Infections after the 6th month can result in abortion. In addition, 2–3 week premature calving, stillborn and weak calves can be a consequence of fetal BVD virus infection.

### Epizootic Bovine Abortion

EBA, also called "Foothills Abortion" is a tick-borne infection of cattle that produces chronic fetal disease and abortion. The vector of this disease is the argasid tick *Ornithodoros coriaceus* which is known to inhabit the foothill chaparral, scrub oak, and manzanita brush areas of California, adjacent areas of Nevada, Oregon and Northern Mexico. Cattle exposed to the vector for the first time are primarily at risk. The infected cow presents no symptoms and if pregnant, passes the organism to the fetus who then becomes chronically infected; there is a 3-month or longer period between exposure of the cow to the tick and abortion of the fetus. Birth of weak calves as well as abortions happen during outbreaks of EBA. The causative agent is, at present, unknown.

## **PARASITIC INFECTIONS**

### Trichomoniasis

Trichomoniasis is a venereal disease of cattle characterized by infertility, pyometra and occasional abortion caused by a protozoan parasite, *Tritrichomonas fetus*. The parasite is carried asymptotically on the epithelium of the penis and prepuce of the bull and transmitted to the cow at the time of breeding. Although abortions do occur most infected animals become, at least temporarily, infertile. The conceptus dies between 18 and 60 days of gestation. The affected cows' return to estrus is necessarily at irregular, delayed intervals greatly extending the breeding season. Thus, repeat breeding becomes an important clinical observation for Trichomoniasis as well as Campylobacteriosis.

Most infected cows are able to eliminate the infection, conceive and carry a calf to term. A small percentage of cows maintain the infection, and carry the calf to term, yet, a very small number will remain infected into the next breeding season.

### Neospora-Like Abortion in Cattle

This relatively new abortion disease is caused by a coccidial parasite called *Neospora caninum*-like. It was named so because of its morphologic similarity to *Neosporum caninum*, a parasite causing disease in dogs. Sporadic abortions were described in the early reports, however more recently, papers from California and New Mexico describe abortion storms up to 10% of the herd occurring in 1-5 month periods. Abortions, as described in these reports, occurred between 5-7 and 5-6 months of gestation respectively. Affected cows show no signs of illness other than retained placentas for several days after the abortion.

A distinct pattern of lesions occurs in aborted bovine fetuses, which includes infection of the brain, heart, skeletal muscle, and evidence of inflammatory

changes in other organs; a specific laboratory test has been developed for the detection of the parasite in animal tissues.

The organism has not been isolated from naturally infected cattle therefore the work necessary to fully characterize it cannot be done. The question remains as to whether the parasite demonstrated in the tissues of the aborted fetuses is *Neosporum caninum* or an antigenically similar protozoal parasite.

While there is no concrete information as to the source or method of transmission, the California group suspected a carnivore host, and the transmission of the parasite by fecal contamination of the feed.

## **ABORTION CAUSED BY PLANTS**

### Pine Needle Abortion

Abortions occur most often in the late fall, winter and early spring in the last trimester of pregnancy in cattle having access to pine needles (*Pinus ponderosa*). Predisposing factors include: sudden weather changes, starvation, changes in feed or sudden access of cows to pine needles. The abortion can begin as early as 48 hours and continue as long as 2 weeks after ingestion of the needles. The affected cow has weak uterine contractions, excessive uterine hemorrhages with incomplete dilation of the cervix. Retained placenta is a constant occurrence often followed by severe uterine infection and peritonitis.

### Locoweed Abortion

Locoweeds are several species of plants of the genus *Astragalus* and *Oxytropis*. The active principle of these plants is an alkaloid called Swainsonine. This toxic substance induces a form of storage disease and continued ingestion of the

plant over a period of 4–6 weeks or more results in failure to thrive, ataxia, behavioral abnormalities (locoism) and abortion. We have also seen in Arizona, Hydrops amnii, a condition in pregnant cows who have ingested locoweed and develop a large accumulation of fluid in the amnion resulting in tremendous distension of the abdomen. In the pregnant ewe both abortion and birth defects can result from ingestion of locoweed. The birth anomalies include: brachygnathia (bulldog jaw), contractures or overextensions of joints, limb rotations, osteoporosis and bone fragility.

### **PLANTS THAT CAUSE ABORTION IN CATTLE**

*Gutierrezia microcephala* (Broomweed)  
*Gutierrezia sarothrae* (Broomweed)  
*Conium maculatum* (Poison Hemlock)  
*Solidago ciliosa* (Golden Rod)  
*Sorghum almum* (Johnson Grass)  
*Trifolium subterraneum* (Cocklebur)  
*Claviceps sp.* (Ergot)

### **BOVINE ABORTION DIAGNOSIS**

Submission of abortion specimens to most veterinary diagnostic laboratories may be done directly or through a veterinarian. In either case, a fee is usually charged for the service.

The following procedures are preferred by the laboratory:

1. Call ahead and notify the laboratory if at all possible.
2. The preferred specimens are: the fetus; placenta, if available; blood samples from the cow or cows that aborted.
3. The fetus and placenta should be placed in a double set of heavy duty plastic bags to prevent leakage, then packed in ice (but not frozen) along with any blood samples in a good quality, leak-proof picnic cooler. Most laboratories will clean and return the cooler if requested.
4. Persons handling aborted fetal and placental material for shipment should always wear disposable gloves and wash thoroughly afterwards, as some infectious causes of bovine abortion can cause serious disease in man. Pregnant women should not handle aborted fetal tissues.

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Arizona Ranchers' Management Guide  
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Arizona Cooperative Extension

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