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Clell V. Bagley

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Animal Health Fact Sheet

ABORTION IN CATTLE

Clell V. Bagley, DVM, Extension Veterinarian
Utah State University, Logan UT 84322-5600

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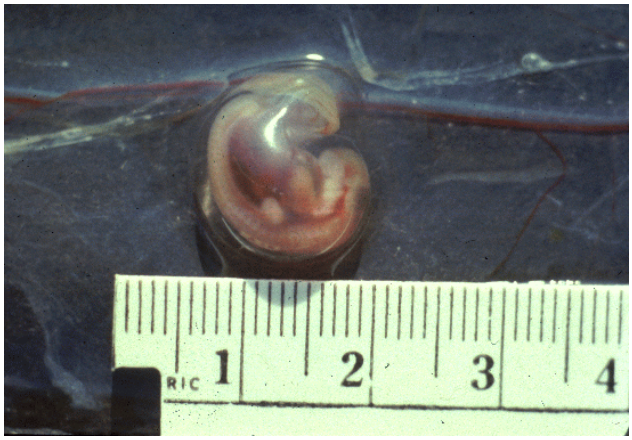
Abortion is the premature expulsion of the fetus from the dam and usually occurs because the fetus has died in-utero. If death occurs at 1-2 months of gestation, it is usually termed "early embryonic death."

This embryo or early stage fetus is usually just resorbed by the uterus with no external signs evident that the pregnancy has terminated. After 2 months of gestation, there is usually the expulsion of the fetus and placental tissues. These may not be seen, however, when the cattle are maintained on pasture, field or range. When the fetus is near term and born dead it is often called "stillborn."



This stillbirth could have occurred due to a difficult birth and the death of the fetus or it may have died in-utero due to disease and was expelled (aborted). Some diseases which can cause abortion may instead result in the birth of a live but weak calf, or in a calf with congenital defects (anatomical or physiological defects present at birth).

Most cattle herds suffer an abortion rate of 1-2%. Seeing a single abortion, therefore, is not usually great cause for alarm. It is certainly best to separate the aborting dam from other animals and to clean up and dispose the aborted tissues.

If the abortion rate increases to 3 to 5% that should be of some concern and the manager should begin to make efforts to obtain a diagnosis. In this process it is best to discuss the problem with the ranch veterinarian, including the vaccination and reproduction history of the herd. The veterinarian can assist in

collection and perhaps in the delivery or submission of samples to a laboratory to attempt a diagnosis.

If a veterinarian is not available, collect the aborted fetus and at least part of the placenta (afterbirth), place in plastic bags and refrigerate (or put on ice) to keep at 38 to 45 degrees Fahrenheit. Do not wash off these tissues and do not allow them to freeze. Record numbers of all dams noted to abort and isolate them from other cows (and bulls).

Cattlemen often blame an abortion on trauma, because of a cow "getting bumped." But the fetus is well protected in the dam and even moderate trauma does not usually cause an abortion. Abortion may be caused by toxins (poisons) found in plants such as:

Ponderosa pine needles
Locoweed
Broom snakeweed (Gutierrezia)
Moldy sweet clover
Mycotoxins
Nitrates

Abortion may also be caused by infectious disease agents (see descriptions below). There are vaccines for several of these agents but they may not be effective if only given in the face of a current outbreak. It will be much more effective to establish a good vaccination program based on the diseases that are known to occur in your area. Discussions with your veterinarian can help you develop and organize a vaccination plan. The plan can be relatively simple but once started, stay with it unless you have very good reasons to change.

INFECTIOUS DISEASES THAT CAUSE ABORTION

Bovine Virus Diarrhea (BVD)

This common abortion disease is caused by a viral agent of which there are multiple strains and types. The virus is usually classified as cytopathic or non cytopathic and as Type I or Type II. All can be significant causes of abortion and producers should not place emphasis on the classifications. It is spread by aerosol or contact and especially from persistently infected (PI) cattle. BVD infection usually causes only a mild disease in the dam. Infection may result in embryonic death and resorption, abortion, congenital defects, or a normal appearing but persistently infected calf (with a very defective immune system). The virus may cause abortion within a few days to 2 months after infection, at any stage of gestation.

The preferred sample is the aborted fetus (refrigerated). Selected tissues are used for virus isolation and fluorescent antibody (FA) tests. Most herds can gain some control of the disease by vaccination of replacement heifers with a modified live virus (MLV) BVD vaccine, 1-2 months prior to their first breeding. Some herds may benefit from continued annual booster vaccination of the cows at 1-2 months prior to breeding. Use of a MLV vaccine during pregnancy may cause abortion and fetal defects but the MLV vaccines can be used when the cows are open. An inactivated vaccine may be used anytime but requires two doses the first year.

It may be possible to eradicate BVD by strict isolation of the herd and testing and removal of persistently infected animals. Part of the challenge with this is to identify and remove newborn PI calves before they expose cows which have been re-bred (which continues the PI cycle).

Brucellosis

This bacterial disease is caused by *Brucella abortus*. Almost all cattle herds in the U.S. are now free of brucellosis due to a long-term regulatory program involving calfhood vaccination and testing and slaughter of carrier cows.

This program was originally initiated by the concern for human health (Undulant Fever). There is still some *B. abortus* infection present in the wild bison and elk of the greater Yellowstone National Park area. These are a threat to cattle herds outside the park, if they are allowed to mingle with them.

The bacteria is spread among cattle by contact with aborted tissues, fluids, etc. It can be spread over longer distances by scavenging dogs, coyotes, wolves or birds carrying infected tissues to new areas. Abortion usually occurs in cattle during the last half of gestation.

The samples used for diagnosis include the fetus and placental tissues for culture. Blood serum from the dam is also helpful for diagnosis of this disease. Vaccination is still very much in use but only heifer calves 4-12 months of age are vaccinated and this must be done by an accredited veterinarian. Any suspected or positive diagnosis of Brucellosis must be reported to state and federal regulatory veterinary officials.

Campylobacter (Vibrio)

This bacterial disease is caused in cattle primarily by an organism currently named *Campylobacter fetus* subspecies *venerealis* (commonly *C. venerealis).* This genera of organisms used to be called "Vibrio." It is spread at breeding (venereal) and usually causes early embryonic death (infertility; repeat breeders). It looks very much like Trichomoniasis, but it can occasionally cause abortion.

The preferred samples for diagnostic work are the fetus and placenta or cervical mucus from the dam,. Samples should be kept refrigerated or sent to the laboratory on Clark's media in a special vial.

Several vaccines are available, but they vary greatly in their makeup, so the directions should be followed carefully for the specific product used. Some vaccines must be used within just a month or so prior to breeding to maintain adequate immunity during the breeding season. One vaccine (oil based) can be given 1-7 months pre-breeding and will still maintain protective immunity through the breeding season. An annual booster is required for all vaccines currently available.

Two other strains of Campylobacter may also cause abortion in cattle. These are *C. fetus* subspecies *fetus* (often called *C. fetus)* which causes abortion in sheep, and *C. jejuni* which is commonly found in the intestinal tract of dogs. These strains are transmitted via ingestion rather than by breeding. It requires extra diagnostic effort to identify these. Currently no vaccines are available.

Chlamydia

This agent is different than a virus or bacteria and is called *Chlamydia psittaci*. The strain involved in cattle abortion is "immunotype 1." This disease usually causes only sporadic abortion losses in cattle but some herds have experienced a loss of 10%. The agent is spread by contact and oral ingestion of the organism. Abortion usually occurs in the last trimester.

For diagnosis, the placenta is especially important so it is essential to submit both the fetus and at least part of the placenta (refrigerated). There is no vaccine. Preventive efforts should be directed to separation of aborting dams and cleaning up all aborted tissues.

Apparently the same or a very similar organism is involved in causing chlamydial abortion in ewes (Enzootic Abortion of Ewes). This agent has also infected pregnant women, causing them to abort, thus pregnant women are advised to stay away from lambing ewes. There are other strains of Chlamydia involved with joint lesions of lambs and calves and eye lesions of sheep, but those apparently do not cause abortion in either sheep or cattle.

Foothill abortion (EBA)

This disease has also been called epizootic bovine abortion (EBA). It occurs in the central-eastern foothills of California, western Nevada and southern Oregon. The agent causing the abortion has not yet been identified but it is spread by the Pajahuello tick as a tick-borne infection. This tick has been consistently implicated in the areas where these abortions occur, or at least where the exposure occurred. Some researchers feel the spirochete Borrelia is the causative agent.

The abortions do not occur until 3-4 months after exposure to the tick and so are usually in the last trimester of pregnancy. The cattle must be between 35 days and 6 months of pregnancy at exposure to the tick or they do not abort. Pre-pregnancy exposure or EBA caused abortion confers immunity for a few years.

The fetus is needed for diagnosis, and information from the grazing history is also essential. In some cases diagnosis may require recovery of ticks from the previously grazed area. There are no vaccines. The cattle at greatest risk are those not previously exposed, which are introduced into those known infected geographic areas when 1-6 months pregnant.

Infectious Bovine Rhinotracheitis (IBR)

One of the most common causes of abortion is this viral agent of the Bovine Herpes Group I. It has caused abortion storms in herds resulting in 5-60% calf loss. Some modified live virus IBR vaccines may cause abortion if they are not specifically designed for use in pregnant cows or if given to calves that are nursing pregnant cows. The viral agent is readily spread via aerosol or contact and is a common cause of respiratory infections in cattle. Abortions are most common during the last half of gestation.

Samples submitted for diagnosis should include the fetus (for fluorescent antibody testing) and the placenta (for viral isolation). Paired blood serum titers from 10 or more herdmates may implicate IBR if they show a four-fold increase in titer.

Replacement heifers should be vaccinated at least a month prior to their first breeding. Make sure that all IBR vaccines used on pregnant cows or calves nursing them are safe for use in cows that are pregnant.

Leptospirosis

This is a bacterial infection of which five common serovars have been identified as causing abortion in cattle: *Leptospira canicola, L. icterohaemorrhagiae, L. grippotyphosa, L. hardjo* and *L. pomona.* Lepto is spread by infected urine or contaminated water (oral ingestion). A variety of animals other than cattle may also be infected by and carry Lepto, including rodents, dogs, cats and man.

Cattle abortion may occur at any stage of gestation but is more common during the last trimester. Some calves may be born alive but weak or they may die in-utero and be retained for up to 72 hours. The aborting dam is usually not ill. It is difficult to culture Lepto from the fetus or placenta. Fetal tissues may be of value in some labs for use with the fluorescent antibody test. Urine from the dam can be used to culture Lepto for up to two weeks after aborting.

The blood serum titers of the dam and of seroconversion of herdmates may also help in diagnosis. Killed vaccines are available for one, three or all five of the Lepto strains. Some herds must be vaccinated every 6 months rather than just annually. *L. hardjo* infected cows may require treatment with antibiotics to clear them and prevent them from continuing to spread the organism.

Neospora

This is a recently recognized disease caused by a protozoan, *Neospora caninum*. It is most common in dairy cattle but also occurs in beef cattle. There are still many questions to answer about this disease. Infected dams only seem to abort when they are severely stressed during pregnancy. But the calves born from these dams are almost always infected and carry that organism for life and infect their offspring. The infection is not spread cow to cow within the herd. Uninfected cows can become infected by exposure to feed contaminated with dog feces. The majority of abortions seem to occur at 4-6 months of gestation after a period of stress to the dam resulting in lowered resistance.

Serum from the dam can be used to determine if she has ever been exposed to Neospora. The aborted fetus, especially the fetal brain, is important in trying to confirm the diagnosis. There are no vaccines.

It is important to prevent dogs from ingesting aborted or other dead calf tissues and also to keep them from contaminating feed supplies with their feces. Hopefully, other methods of prevention will soon become available.

Sarcocystis

This protozoan organism commonly infects cattle but only rarely and with massive infection does it cause abortion. Infected dogs, coyotes, foxes and cats shed this protozoan in their feces as a very resistant stage which survives in the environment and is ingested with forage. Severely affected cows usually abort during the last trimester.

The best tissue sample is a caruncle (placentome) from the uterus submitted for histopathology or fluorescent antibody diagnosis. There are no vaccines. Infection usually causes no signs or only mild signs in cattle.

Trichomoniasis

Trich is caused by the protozoan *Tritrichomonas fetus*. This organism is spread at breeding (venereal) only. The majority of cows clear themselves of the infection after several estrus cycles. Bulls tend to remain infected and carry the organism from one breeding season to the next. Trich usually results in early embryonic death, which appears as repeat breeders and infertility. But it may occasionally cause abortion, usually at less than 5 months gestation.

Diagnostic samples can include the fetus, placental fluids and cervical mucus from the dam. Preputial scrapings from the bulls can also be used to grow and identify Trich. A vaccine is available for use in cows but must be combined with other control efforts for the herd. The vaccine will not prevent bulls from becoming infected, nor clear them if infected. Control is directed at identifying positive bulls and culling them from the herd. Keeping bulls separate from cows, except during the planned breeding season, also reduces the spread.

Other infectious agents may also cause abortion. Those described herein are usually the most common.

SUMMARY

Infectious Disease	Samples for Diagnosis	Usual Stage of Gestation	Control Methods
BVD	Fetus	2 months after exposure	MLV vaccine to heifers; culling of PI animals
Brucellosis	Fetus, placenta Serum of dam	Last half	Regulatory program; heifer vaccination; test / cull
Campylobacter (Vibrio)	Cervical mucus, fetus, placenta, preputial scraping	Early embryonic death or abortion	Vaccine for *C. venerealis* Antibiotic treatment
Chlamydia	Placenta (& fetus)	Last trimester	Separation, sanitation
Foothill Abortion	Grazing history, fetus and ticks	3-4 months after exposure (last trimester)	Expose heifer calves to geographic area
IBR	Fetus, placenta, sera of 10 herdmates	Last half	Vaccination program
Lepto	Urine of dam, fetus, serum-dam, herdmates	Any stage	Vaccine, antibiotic
Neospora	Serum of dam; fetus (brain)	4-6 months	Dog control - fetal tissues and out of feed areas
Sarcocystis	Caruncle from uterus	Last trimester	Canine feces away from feed
Trich	Fetus, placenta, cervical mucus, preputial scraping	Early embryonic death or under 5 months	Identify and cull infected bulls; control breeding; vaccine

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