

VETCARE



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Dear reader,

Abortion is one of the major causes of economic loss in a dairy farm. There are several causes for abortion which are outlined in this issue. Proper action taken at the right time can prevent the occurrence of abortions.

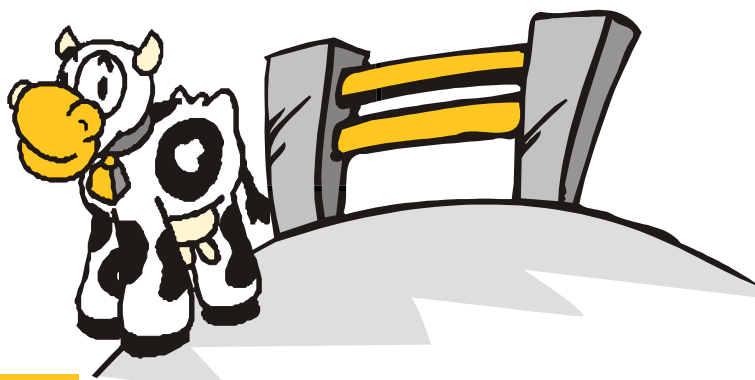
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ABORTIONS IN DAIRY COWS

New Insights and Economic Impact

Abortion is defined as fetal death and expulsion between 42 (an estimated time of attachment) and 260 days (the age at which a fetus is capable of surviving outside the uterus) of gestation.

The condition does not include fetal maceration and mummification.



Process of Abortion

Abortion results from premature initiation of parturition when normal relationships between fetus and dam fail. This results in the expulsion of a fetus that is incapable of independent life. Effective fetal control of the pregnant uterus is lost after the fetus dies. Abortion can occur any time during gestation. Most of the abortions occur during the first trimester of pregnancy, go unnoticed and the animal is treated clinically for infertility.

Although many factors have been incriminated, the mechanism of abortion has never been explained. Whether abortion and normal parturition are mediated through the same pathways is unknown, but irrespective of the cause of abortion there is drop in progesterone level in the animal. The pathogenesis for abortion may be acute or chronic. In general, premonitory signs are usually lacking.

Incidence

The greatest risk of fetal loss is during the first trimester of gestation and then progressively decreases as gestation advances with a slight

increase in the risk toward the last month of gestation (Thurmond, et al., 1990). All the abortions in the first trimester go unnoticed or undiagnosed and we always suspect fertility problems when cows are found open rather than embryo/fetal loss. The observed fetal loss is far less than the actual incidence. The cumulative incidence of fetal loss between 31 and 260 days of gestation is 10.8%. Of this only 20% of the fetal losses are detected by observation of an expelled fetus or fetal membranes and the proportion detected increases with increasing gestational age at time of fetal loss (Forar, et al., 1996). It is also believed that the abortion rate increases after 5 pregnancies or after 4 calvings and furthermore the risk is higher for an animal that already had an abortion.

Causes

Both infectious and non-infectious agents may cause abortion. The infectious causes include bacterial, fungal, viral, and protozoan. Historically, it has been suggested that 50-65%, 20-25%, and 15-25% of infectious abortions were caused by bacterial, fungal, and viral causes respectively.

The non-infectious causes include nutritional factors, chemicals, drugs, toxins, poisonous plants, and hormonal agents. Under modern systems of dairy management cows & buffaloes continue to experience a seemingly high risk of abortion, despite intensive efforts toward immunization against infective agents.

It should be remembered that because of the endemic nature of abortion occurring in vaccinated cattle, factors other than the infectious agents might contribute to the risk of abortion. Thus, preventive strategies to contain abortion on farm become utmost important. Exogenous progesterone can become a handy tool in prevention of abortion especially during the first trimester of gestation.

Infectious causes of Abortion

Bacterial

The organism *Brucella abortus* causes brucellosis. Aborted fetus, uterine discharge, placenta, infected premises and milk are sources for the spread of infection, and abortion occurs from 6 to 9 months into gestation. It is possible to eradicate the condition through vaccination.

Leptospirosis is caused by *Leptospira pomona*, *hardjo*, *canicola*, *icterohemorrhagiae*, and *grippotyphosa*. Infected cows, wildlife, swine, water and feed contaminated with urine are some of the sources of infection. Abortion occurs in the last trimester of gestation.

Camphylobacter fetus causes *Camphylobacteriosis*. Infected bulls and cows spread the infection and abortion occurs from 6 to 8 months of gestation. *Listeriosis* is caused by *Listeria monocytogenes*, and the organism is excreted in feces, urine and milk. The organism grows in silage with high pH. Abortion occurs mostly in the later part of last trimester.

Haemophilus somnus is responsible for the *haemophilus somnus* complex. Infected cattle spread the infection possibly via the respiratory route. The organism is capable of causing abortion in all stages of gestation.

Ureaplasmosis is caused by *Ureaplasma diversum* and is spread via semen, vulvar discharges, and possibly by nasal secretions. Abortion can occur anytime but usually in the last trimester of gestation. Other bacteria like *Salmonella*, *Actinomyces*, *Escherichia coli*, *Streptococcus*, *Staphylococcus*, *Bacillus*, *Pseudomonas*, *Proteus*, *Pasteurella*, *Nocardia*, and *Chlamydia* species, can also cause abortion. These are secondary to either a septicemia in the dam or ascending infection through the vagina and cervix or due to persistent endometritis.

Mycotic

Fungal or mycotic infection of the placenta is one of the most common causes of sporadic bovine abortion. Anywhere from 20-35% of abortions have been attributed to fungal causes. Abortion occurs when fungal spores enter a pregnant cow's blood stream (possibly through breaks in the lining of the upper digestive tract), settle at the junction of the maternal and fetal placentas, grow and attack the placental tissues.

Aspergillus fumigatus accounts for 60 to 80 percent of abortions that are caused by fungal organisms. The organism may cause abortion from 4 months to term. Any condition/stress that reduces the cow's resistance to infection increases the chances of mycotic abortion. Providing good health (via good management and nutrition) and not feeding moldy feeds can reduce the incidence.

Viral

Infectious Bovine Rhinotracheitis (IBRV) or Bovine Herpesvirus 1 (BHV-1) is a major cause of viral abortion. Although the development of effective vaccines appears to have reduced the incidence of IBRV induced abortions, it still remains the most frequently diagnosed viral cause of abortion. Abortions occur from 4 months to term.

Bovine viral diarrhea causes abortion usually in the early part of gestation (up to 4 months) and is spread by infected cattle housed or pastured together.

Protozoal

Trichomoniasis: Caused by *Tritrichomonas fetus* and is spread by venereal transmission. The organism is responsible for early embryonic death, infertility, and rarely abortion.

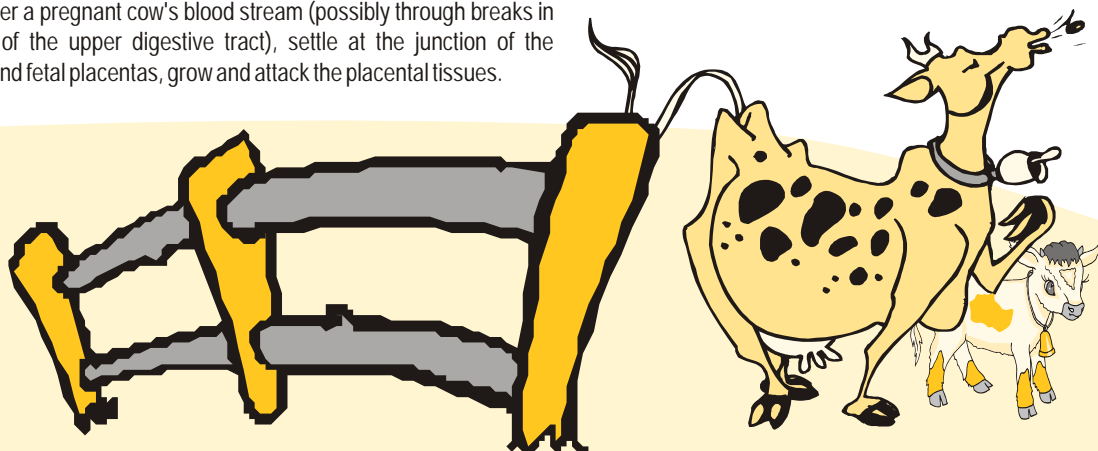
Neosporosis: *Neospora caninum* is a recently recognized protozoan parasite of animals. It is probably not a new disease, but rather a newly recognized one. *Neosporosis* is a major cause of abortion in cattle in many countries including Canada and USA (Dubey and Lindsay, 1996; Pare et al., 1996). An important feature of the disease is that the parasite can be maintained in cattle as a chronic, apparently lifelong, infection, which can be passed on to the fetus during pregnancy.

The greatest risk of fetal death is observed between 98 and 105 days of gestations.

Recent epidemiological studies have suggested that the dog may be involved in the transmission of *Neospora caninum*. It is possible that the dog is the definitive host (Anderson, 1999). Presence of dogs and presence of seropositive cattle in control herds in a detailed study, suggested the role of dogs in the spread of the condition.

Non-infectious causes of abortion

Nutritional: Starvation may result in placental insufficiency and abortion, however, it rarely occurs in a modern dairy practice. Vitamin A deficiency has been suggested to result in thickening and degeneration of placenta and abortion in late gestation. Iodine deficiency has also been suggested as a cause of abortion.



Chemicals, drugs, and toxins: High concentration of nitrates in plants/weeds can cause abortion from 3 to 9 months of gestation. Ergot can cause placental necrosis, fetal death and abortion. Warfarin and coumarin can also cause abortion. Mycotoxins from the fungal agents are suspected to cause abortion. Bacterial endotoxin is responsible for sporadic abortions.

Among the hormonal agents, estrogen, glucocorticoids, and prostaglandin are important. They cause abortion depending on the dose and the stage of gestation they are used. Stress of any kind increases cortisol level in body & hence may cause abortion.

Other factors also contribute to diagnostic difficulties (Kirkbride, 1982):

- The fetus is often retained in uterus for hours to days after death, resulting in autolysis that hides lesions.
- The fetal membranes, which are commonly affected first and most consistently, are frequently unavailable for examination.
- Toxic and genetic factors that may cause fetal death or abortion are not discernible in the specimens available for examination.
- Many causes of bovine abortion are unknown, or there are no effective routine diagnostic procedures for identifying them.

Agent	Stage of Gestation usually affected	Means of spread	Comments
Bacteria			
Leptospira spp.	Third trimester (L. Pomona) or anytime (other serovars)	Water contaminated by wildlife, or other cattle (L. hardjo)	Duration of efficacy of currently available vaccines is limited.
Listeria monocytogenes	2nd or more commonly 3rd trimester	Most commonly found in poor quality or spoiled silage.	
Ureaplasma diversum Mycoplasma bovis	Any Stage of gestation.	Infected animals (esp. bulls) introduced into clean herds; poor AI practices	Can be found in repro tracts of normal, healthy cows. May cause abortion storms in previously uninfected herds.
Viruses			
Bovine Virus Diarrhoea	1st or 2nd trimester	Calves may become chronically infected prior to birth. May be introduced into the herd by an infected animal	BVD viral vaccines are commonly available.
Infectious Bovine Rhinotracheitis	2nd or 3rd trimester	Animal to animal contact with some aerosol spread	Abortion is usually in addition to other disease manifestations (pneumonia). IBR vaccines are commonly available.
Other			
Neospora caninum	2nd or 3rd trimester (often 4-5 months)	Canines play a role in the transmission of Neospora	Animals that abort due to Neospora are at increased risk of aborting again. Does not usually cause abortion storms. A vaccine has recently become available.
Trichomonas foetus Campylobacter fetus	1st trimester, occ. During 4-7 months (Campylobacter)	Bulls are the main mode of transmission (esp. older ones). Infected cows can reinfect clean bulls. AI equipment may transmit infection.	

Diagnosis:

Only 30% of abortions are currently being diagnosed. Although infectious agents have been incriminated in 20-30% of abortion cases submitted to diagnostic laboratories. The causes of most abortions in dairy cows remain obscure, even though endemic rates may reach or exceed 10%. Vaccination and diagnostic efforts have had marginal success in solving endemic abortion problems. Constraints to diagnosis arise in interpreting the results of tests because most abortions are not detected for several weeks or months, by which time appropriate tissues may be unobtainable. Moreover, tissues submitted are usually from fetuses large enough to be noticed by dairy personnel. One reason for the low diagnostic success rate is that abortion is frequently the result of an event that occurred weeks or months earlier, and the cause of the event. The only thing that is ever present is the conceptus; the real cause is often undetectable by the time of abortion.

- Earlier abortions are not recorded and small fetuses are not submitted (Thurmond and Picanso, 1990). Also there is low diagnostic success rate for first trimester abortions.

Interpretation of Results

Interpreting diagnostic results presents some problems. Although organisms of relatively low virulence can cause abortion, such organisms are frequently may be present in fetal or fetal placental tissues as in utero infections, but they do not actually cause abortion. Determining the significance of their presence in relation to the abortion may be impossible at times. The agent isolated from an aborted fetus and identified as the cause of the abortion may be only one of two or more agents involved.

Prevention

There is no practical treatment for controlling an abortion outbreak. As most abortifacient pathogens are spread by ingestion, animals that have aborted or are suspected to abort should be isolated until vaginal

discharges have ceased. The only effective control in cases of infectious abortion is vaccination when available. Good record keeping systems help to monitor the trends and occasionally assist in diagnosis or solution to the problem.

Economic Impact

It is ideal to have every pregnant cow go to term and have a healthy calf. However, some losses due to abortion are expected and the maximum

loss of 3% is acceptable. The economic impact of abortions depends on direct costs and value of fetuses lost. Indirect costs include those associated with establishing the diagnosis, re-breeding cows that aborted, possible loss of milk yield, and replacement costs if cows that aborted are culled.

Aborted cows if not culled have 5 times more likely to abort subsequently than cows that never aborted. The animals take more time to rebreed after an abortion; however, there is a gestation age effect. As gestational age increased, time to rebreed increased.

Conclusions

In the event of an abortion (either sporadic or an abortion storm), it is but natural that each person involved in the farm level dairy operations would like to know the cause, risk for other animals, and to control the abortion from spreading to other animals. Finally and most importantly from the financial aspect, we always would like to know a way to prevent the condition. Abortions do occur despite the implementation of remedial measures. One has to realise fact that a few abortions would still take place despite of the best practices adopted.

The Indian farmer is more concerned about his profits from milk. Therefore it becomes important for the animal to complete its gestation period in order to enable development of mammary glands. Diagnosing the cause of abortion is presently near to impossible task in Indian condition. The practice in India is to check abortions whenever clinical signs are observed. The treatment regimen followed in general is administration of anti-microbial drugs, anti spasmodic drugs and exogenous progesterone preparations.

Dosage of the exogenous progesterone, established by the reputed institutions is 500 mg (2 ml of commercial Hydroxy-progesterone preparations). This dose if used as per the recommended schedule of administration by the manufacturer effectively checks habitual abortion. Exogenous progesterone can be used as management tool to control abortions in the first trimester of pregnancy, as the fetus is at more risk in this period. Exogenous progesterone also helps to control prolapse of vagina, cervix and uterus. Progesterone is a hormone therefore; it is advised not to increase/ decrease the scientifically established dose.

Vetcare presents the time-tested product by the veterinarians in India DURAPROGEN containing Hydroxy-progesterone caproate.

DURAPROGEN

DURAPROGEN is a depot progesterone preparation used to treat the reproductive disorders of female farm animals that need progesterone therapy.

Composition:

DURAPROGEN injection contains Hydroxyprogesterone Caproate IP 250 mg/ml.

Pharmacology:

Progesterone is a gonadal hormone secreted principally by corpus luteum. It regulates several functions in reproduction viz., maintenance of pregnancy, induction of ovulatory heat, development of mammary glands, suppression of uterine motility etc. Low levels of progesterone stimulate the pituitary to secrete gonadotropins. Unstable endocrine constitution leading to progesterone deficiency may cause abortion, anoestrus, repeat breeding. An injectable depot of progesterone helps correcting these disorders.

Indications and Dosage

Indication	Dosage
Habitual Abortion	
Early pregnancy	2 ml IM First injection on 45 th day, followed by 4-5 injections on every 10 days interval
Mid / late pregnancy	2 ml / IM For 3 days in the probable month, followed by 3 injections at weekly interval
* Repeat breeders with weak CL (Early Embryonic Death)	2ml IM after AI, followed by 3 injections at weekly interval
* Prolapse of uterus	2 ml IM, 3 injections on alternate day followed by 3 injections at weekly interval if required.

PRESENTATION Pack of 2ml Ampoule



Sir, I believe you passed a comment about me yesterday that I am fit only for grazing cows. When do I get my cows sir?

