

Malignant Catarrhal Fever in Cattle

Malignant Catarrhal Fever (MCF) is caused primarily by two different herpes viruses, one found in the wildebeest as a reservoir host and one found in sheep as a reservoir host. **These reservoir hosts are clinically unaffected by infection with the virus but can serve as a source of infection for susceptible animals such as cattle, deer, bison, water buffalo, and pigs which can die from the infection.**

MCF virus attacks the blood vessels in multiple organs so clinical signs can be quite variable and may include sudden death, high fever, diarrhea (sometimes bloody), ocular (eye) and nasal discharge, or seizures. Peracute (rapid onset) disease, which tends to occur in highly-susceptible species, is characterized by few clinical signs, but rapid progression and death. Sudden death may be preceded by a day of depression, weakness, or diarrhea. More apparent clinical signs are seen when animals survive longer. Animals with acute disease develop a high fever and stop eating. Cattle often have bilateral corneal opacity that begins at the corneoscleral junction (between the white part of the eye and the cornea) and progresses inward. (See picture below.)



Photo by Fakri Fatima Zohra, Wikimedia



Plum Island Animal Disease Center (PIADC)

Serous (watery) oculonasal (eye/nose) discharge is common early in the course of the disease; later, this discharge becomes mucopurulent (mucus/pus). The muzzle and nostrils are usually encrusted, and labored breathing and salivation may be seen. The inside of the mouth is often reddened and with erosions and ulcers. The skin is sometimes reddened or ulcerated, and hardened scabs may develop. In some animals, the

hoof may be loosened or slough off. The joints may be swollen, milk production often drops, and the superficial lymph nodes are markedly enlarged. Diarrhea, with or without blood and blood in the urine also be seen. Occasionally, animals have nervous signs including hyperesthesia (increased sensitivity to touch), incoordination, disorientation, tremors, nystagmus (a rapid, involuntary, oscillatory motion of the eyeball), or head pressing. Although many animals die, chronic infection or recovery is possible. **There is no treatment for this viral disease.**

Definitive diagnosis of MCF requires laboratory testing. Antibody testing by cELISA may be done with either serum or plasma (“red-top” tube). Live animal detection of viral DNA by Polymerase Chain Reaction (PCR) may be done on whole blood in EDTA (“purple-top” tube). Preferred postmortem (dead animal) samples for detection of viral DNA by PCR are lymph node or spleen, but other acceptable tissues include lung, kidney, and intestine. Formalin-fixed tissues can also be submitted for microscopic detection of vasculitis (inflamed blood vessels). Detection of MCF antibody in clinically susceptible species (e.g. cattle, bison, and deer) indicates infection, but is not diagnostic of disease. Lack of antibody (negative cELISA test) generally indicates lack of infection except in the very early course of clinical disease (< 7 days) before antibodies can be produced. Therefore, PCR should be used to confirm suspected cases of clinical MCF. PCR detection of viral DNA in white blood cells or other tissues correlates better with clinical disease since in most latently infected animals viral DNA is below the threshold of detection. WSU-WADDL offers the MCF cELISA and the Sheep-associated MCF PCR “in house” as well as the Wildebeest-associated MCF PCR assay in collaboration with USDA:APHIS National Veterinary Services Laboratory in Ames, IA.

Although in the US, sheep are the most likely source of infection for cattle, in April 2008, the USDA reported confirmatory tests diagnosing wildebeest-associated MCF in a cow from a mixed-use operation in Texas. The disease appeared to have spread to from exposure to captive wildebeests. This report highlights the fact that **the disease is reportable because it can look similar to some foreign animal diseases like rinderpest and can also look like mucosal disease (from BVD) or bluetongue.** In a study involving case data to try to differentiate MCF from mucosal disease and bluetongue, there appeared to be tremendous overlap in clinical signs. **Veterinarians should be called to assess any unusual death on a farm or ranch and if cattle are showing signs of high fever or lesions in the mouth or on the feet, the veterinarian should notify the state department of agriculture.**



“MCF-like disease is reportable because it can look similar to some foreign animal diseases like rinderpest...”

- Report any unusual diseases/deaths to a veterinarian or the state veterinarian
- To prevent MCF, keep cattle separated from sheep, particularly young lambs
- MCF is not transmitted between cattle
- MCF does not affect people

The incubation period (time between exposure and signs of disease) can be long in susceptible animals, latency is possible, and the only reliable methods of control are to separate susceptible species from carriers or breed virus-free reservoir hosts. Most cattle are susceptible to the wildebeest form but are relatively resistant to the sheep-associated form of MCF.

It is important to note that MCF is not a contagious disease between cattle (cannot be transmitted from “cow to cow”), poses no threat to human health and cannot be transmitted between people and animals.

Malignant catarrhal fever can be prevented by separating susceptible animals from sheep, goats, wildebeest or other suspected reservoir hosts. Cattle should particularly be kept separated from very young lambs that seem to be able to shed larger amounts of virus. From two reports from the Animal Disease Research Unit at WSU, bison were particularly susceptible to MCF. At a feedlot, where bison were exposed to lambs, about 50 days after exposure, scores of bison were dying daily. Of the over 1600 head of bison, over 800 head died. Of the 177 head of bison in the feedlot that were put into a sheep pen after the sheep were removed, none died. Only one of the beef cattle in the lot developed MCF. No additional bison cases were noted about two weeks after departure of the sheep. The distance between the bison and sheep made a difference in the mortality rates.

Distance between lambs and bison	1.6 km	4.2 km	5.1 km
Mortality rate	17.5%	6.1%	0.43%

Dose of the virus appears to be the key to the development of disease in cattle. It is not common for cattle to develop the sheep-associated form of MCF, and separation from sheep is not always necessary, especially from adult sheep. Because an outbreak of sheep-associated MCF was recently reported in cattle exposed to hand-reared lambs in the Netherlands and the MCF outbreak reported herein of cattle likely exposed a local Washington fair warrant caution in housing cattle and sheep in close contact. **For this reason, it would be prudent to avoid mixing cattle and sheep, particularly lambs that are actively shedding virus.**

***For testing information, see the WADDL website:**
http://www.vetmed.wsu.edu/depts_waddl/dx/MCF.aspx

***For the Washington state veterinarian’s office:**
<http://agr.wa.gov/FoodAnimal/AnimalHealth/ContactUs.htm>

References

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