

Malignant Catarrhal Fever – What you Need to Know

Based on Material prepared by Janet Maass

With bison and sheep markets in an upward trend, expansion of both industries in Canada can be expected. This expansion may increase the potential for outbreaks of Malignant Catarrhal Fever (MCF), a disease of bison which is known to be caused by a virus transmitted from sheep. Bison producers and sheep producers alike need to be aware of this disease and carefully consider the proximity of these species when establishing or expanding their operations. The following are answers to the most common questions regarding MCF in bison and the virus that causes this disease.

Q. What is malignant catarrhal fever?

A. Malignant catarrhal fever (MCF) is often a fatal viral disease that primarily affects ruminant species world-wide, such as domestic cattle, bison, deer, moose and water buffalo. In bison it has always been fatal.

Q. What type of virus is it?

A. The virus that has been so deadly to the bison is in the Gammaherpesvirus family and is called ovine herpesvirus-2 (OvHV-2). Ovine is the scientific name for sheep. It is sheep that carry this virus with no ill effect to them.

Q. Where does the MCF virus that affects bison come from?

A. Domestic sheep are a source for the virus. Nasal shedding from sheep is the predominant mode for transmission. **It does not have to be nose-to-nose contact and the virus can be transmitted up to five kilometers from large sheep feedlots.**

Q. Is there more than once MCF virus?

A. Yes. In Africa the wildebeest form is caused by alcelaphine herpesvirus-1 (AlHV-1) carried by wildebeest. In North America, the caprine (goat) herpesvirus-2 (CpHV-2) is present in goats, and this virus has been known to cause MCF in deer. However, to date there is no report of CpHV-2 causing MCF in bison.

Q. Are all sheep infected?

A. Virtually all sheep flocks are infected. However, the lambs are usually not infected until after two months of age under natural flock conditions. If they were removed at weaning from the ewes and put on clean property (far enough away) at about two months of age, they would most likely remain virus-free.

Q. Are all sheep shedding at all times?

A. No, sheep shed the virus only periodically, in an unpredictable manner. However, adolescent sheep between 6 and 9 months of age shed the virus more frequently and more intensively than adult sheep. This largely coincides with the ages at which lambs are brought into feedlots for finishing.

Q. Why is MCF so prevalent now?

A. Probably there are two reasons for this: one is the increase in the bison population. Since bison are much more susceptible to MCF than cattle, you will see more cases in bison than cattle in the same ranching conditions. The other is because owners are now talking about MCF more openly. For a long time, when less information was available, owners did not say anything if they had a case of MCF. If word got out, your herd was considered contaminated and no one wanted to purchase any animals from you and the value of the herd decreased.

In 1972 there was an outbreak in a cattle feedlot in Colorado in which 87 of 235 cattle died. At the same time, a second episode of MCF occurred in a herd of mule deer in which 14 of 19 mule deer died. Since then, during 1998 and 1999 an estimated 150 bison died of MCF at a feedlot in the American Midwest, 45 of 163 bison submitted from a sale in Saskatchewan died and 825 bison died in early 2003 in southern Idaho. These outbreaks are just the bigger cases of lost bison. There have been reports where multiple owners have lost their entire herds.

Q. Is there a treatment for MCF?

A. No, there is no effective treatment available. Some have attempted treatment with corticosteroids, vitamins, antibiotics, and other supportive treatments as well as Banamine for fever, but none have been successful in bison.

Q. What is the age of the bison before they can contract MCF?

A. There is no evidence indicating young bison calves are more resistant to the disease than older bison. Fewer cases found in younger bison may be due to less exposure to sheep than older animals. There are two reported cases, one in Canada and another in Colorado, where the calves were about 3 months of age when they contracted MCF.

Q. Is it possible to misdiagnose MCF?

A. Yes, the symptoms in bison sometimes are very subtle and can often be missed or misdiagnosed as bovine virus diarrhea virus (BVDV), respiratory virus, or a bacterial infection. It is possible that an animal is being treated for a secondary infection and the primary MCF is missed.

Q. What are the symptoms seen in a bison with MCF?

A. This list is what has been most often seen, but symptoms are not limited to these. There may be only one symptom or multiple symptoms, or the animal may be found dead with no symptoms noticed before death.

DEPRESSION—Generally the head is held down about a foot. The animal usually wants to separate itself from the herd. It may not eat corn, or range cubes, but will continue to eat grass or hay.

CLOUDY EYE—It may be in one or both eyes. The lens of the eye may appear slightly gray to totally white. One may see only gray right around the outside of the cornea of the eye. In more extreme cases, the lens could bulge, or even rupture.

WEeping EYE—Could be one or both eyes tearing from a slight bit to two to four inches of wet hair under the eye. The eye might be slightly closed. May have white matter in the corner of the eye to all around the eye. This could be mistaken during cold weather or high winds.

NASAL DISCHARGE—Can range from watery discharge to white (milky) mucus strands from one or both nostrils. This generally appears more severely in cattle than in bison.

EROSIONS—Small sores or open lesions in the oral cavity which can extend into the larynx and esophagus.

FEVER—Has been as high as 42.5° C, but the temperatures can vary over a wide range.

SWOLLEN JOINT—Area around the joint may be swollen. Has been seen 10 to 12 days prior to onset of any other symptoms.

SALIVATING--Clear watery mucus dripping from the mouth. May be confused with eating too much mineral/salt.

STRAINING TO URINATE—Attempting to urinate often, possibly because of lesions in the urinary bladder or could have bloody urine.

ALTERED GAIT—The back stifle (mid) joints may be rotated inward.

OTHER SYMPTOMS—Choking/coughing, aborted fetus, dehydration, loss of appetite, diarrhea, tremors or circling.

Q. Is MCF passed from bison to bison?

A. No, several studies have shown that the bison with clinical MCF did not transmit the disease to their herd-mates. The most compelling evidence is the incident at the bison sale in Canada where the bison at the sale were exposed to the sheep for less than a day. There were 163 bison submitted to the sale of which 45 animals died of MCF anywhere from 50 to 220 days later. These 163 bison were bought by 11 different farms. These bison were mixed with 1010 bison on these 11 farms. There were no cases of MCF on the 8 selling farms and there were no MCF cases involving the 1010 newly exposed bison on the 11 purchasing farms. All the bison that died of MCF were the bison that were at the sale and exposed to the sheep. Another piece of strong evidence is the report of an outbreak among bison in southern Idaho. The study showed that 825

(51.24%) out of 1,610 head that were exposed to sheep developed clinical MCF, whereas among 177 bison that were moved to the feedlot 25 days after the departure of the sheep not a single animal developed MCF, even though they were closely exposed to diseased pen-mates.

Q. What is a safe distance between bison and sheep?

A. This is the number one question researchers get asked most. It is not possible to give a safe distance with 100% certainty as there are too many variables. It depends on the age of the sheep, the size of the flock, and other factors such as climate, wind, and temperature. In general, increasing the distance between sheep and bison reduces the risk.

Q. Does the virus survive in the environment?

A. The virus can survive up to 72 hours in the environment, but may survive up to 13 days if the environment is moist.

Q. Why does MCF usually occur during the winter months?

A. MCF in bison and cattle can occur any time throughout the year. The reason it appears to be more prevalent during the winter months is due to the timing when the lambs are born during the year. The winter months are the time when these lambs come of age (between 6-9 months) and this is the group of sheep that sheds more virus. It is also possible that virus survivability is better in the cold winter season.

Q. If an outbreak occurs, how long could it last?

A. This can vary with the source of the infected sheep. If there are sheep within transmissible distance it may start and stop during different times through the year. If the animals are moved to another area away from sheep, you usually will not see additional cases after 50 to 60 days.

Q. Do people get MCF?

A. There is no evidence ever reported of a person getting MCF.

Q. Where in the country can MCF occur in bison?

A. Anywhere.

Q. What tests are used to determine that an animal has MCF?

A. The definitive test is PCR (polymerase chain reaction) that can indicate the presence of the MCF virus in the blood or tissues. MCF can also be determined by examining tissues microscopically after an animal has been necropsied. A CI-ELISA (competitive-inhibition enzyme-linked immunosorbent assay) can determine if there is MCF viral antibody in the blood, but a positive result does not mean the animal has MCF. It only means the animal was exposed

to the virus at some time. Researchers have found that about 10 to 20% of bison in ranches might be already latently infected (have the virus but do not develop the disease) with the MCF virus.

Q. If a bison is positive for MCF should the animal be culled from the herd?

A. There is no reason to cull the animals as we know that bison with clinical MCF will not transmit the disease to other herd-mates. Researchers also found that it is uncommon for MCF viral antibody-positive bison to come down with the disease. So bison producers should not worry too much about MCF seropositive bison in their herds.

Q. If I have an animal die and I suspect MCF can I wait until the next day to take the animal to the diagnostic lab or have my veterinarian necropsy the animal?

A. It is better to conduct the postmortem examination as soon as possible because bison tissues deteriorate quite rapidly after death, as their hair coat holds the heat in.

Q. How can we prevent our animals from getting MCF?

A. Be aware of your surroundings. Do not move bison into an area where there are sheep; nor should sheep be put in an area where bison are. We know this virus is airborne when it can infect the bison from a distance of a couple of miles. In one outbreak the bison were in a pasture about three miles away from the sheep (at a large feedlot). The rule of thumb is to separate bison from sheep as far as you can. Currently, there is no vaccine available for bison against MCF.

The above information was taken from the Guide to MCF located on the National Bison Association website. The full version of this guide can be found at:
http://www.bisoncentral.com/doc_lib/MCF4.08.pdf.

Thank you to the author, Janet Maass, for granting permission to use this material:

Janet Maass
PO Box 270733
Ft Collins, CO 80527