Malignant catarrhal fever (MCF)

Introduction
Malignant catarrhal fever is a sporadic, frequently fatal, and generalized viral disease of cattle, pigs, domesticated buffaloes and free-living deer and moose, and a wide range of antelopes, African buffaloes and bison in captivity. More than 150 ruminant species are susceptible to MCF virus infection based on serological evidence, and clinical disease has been described in over 30 of them, almost exclusively in captivity.

Salient features of MCF
Malignant catarrhal fever in cattle occurs through infection with either the gammaherpesvirus of wildebeest, alcelaphine herpesvirus-1 (AlHV-1), or of domestic sheep, ovine herpesvirus-2 (OvHV-2). In their natural hosts, these viruses do not cause clinical disease. The incubation period in cattle varies from 4-7 weeks, but may in exceptional cases be several months. The classical presentation of MCF is characterized by fever, anorexia and inflammation of the mucous membranes of the mouth, nose and eyes.

The ocular and nasal discharges may at first be serous or seromucoid, but later become more profuse and mucopurulent. The muzzle rapidly becomes dry, necrotic and cracked, and the mucopurulent exudate from the nose, which may be blood-stained, coagulates forming a tightly adherent crust that may partially occlude the nostrils. Accumulation of exudate in the nasal passages leads to dyspnoea, open-mouth breathing and drooling of saliva. Enlargement of the peripheral lymph nodes is usually present. There is severe conjunctivitis and bilateral corneal opacity is a constant and characteristic finding in all cases of MCF. Signs of neurological involvement such as hypersensitivity, muscle tremors, nystagmus, incoordination, high stepping gait, convulsions and stupor are sometimes manifested terminally.

Where does MCF occur?
The disease has a worldwide but highly variable distribution due to the distribution of the reservoir ruminant species, namely blue wildebeest (Connochaetes taurinus), black wildebeest (Connochaetes gnou), and sheep and goats. Two forms of the disease, namely wildebeest-associated MCF and sheep-associated MCF have been recognized. In Africa, MCF is predominantly found where cattle are in close contact with blue or black...
wildebeest. Malignant catarrhal fever has never been reported in any free-living wild animals in Africa, notwithstanding the fact that the reservoir host, namely wildebeest frequently roam with a wide variety of antelope. Outside Africa, it is usually associated with contact between sheep and susceptible species. Sheep-associated malignant catarrhal fever is also present in Africa but is less common.

What triggers an outbreak of MCF?
The actual mode of spread of the virus has not been conclusively established, but natural spread is generally, if not exclusively, by aerosol from nasal mucus. Transmission of AlHV-1 is very efficient among wildebeest. All calves become infected in the first few weeks of life. Calves may become infected in utero or via the respiratory tract, even in the presence of maternally-derived antibody as all adult wildebeest have neutralizing antibodies against AlHV-1. The wildebeest calves shed cell-free virus in their nasal secretions that serves as the source of infection for cattle in close proximity. There is therefore a marked increase of cases during the first few months following the birth of young wildebeest calves that are in close contact with cattle.

In contrast to the situation in wildebeest, OvHV-2 infection does not commonly occur in perinatal lambs. Lambs become susceptible when colostral immunity declines and develop infection when sheep in the same flock experience viral shedding episodes. These short-lived (24-36 hours) peaks of viral DNA in nasal secretions that occur sporadically and mostly between the ages of 6-9 months and rarely in older sheep, are also responsible for infection and induction of clinical signs in cattle.

All reports consistently indicate that spread does not occur from animals with clinical MCF and the disease is therefore regarded as a non-contagious between clinically affected and susceptible cattle.

Prevention and control
The unavailability of an effective vaccine, and the wide distribution of carrier species, make MCF a difficult disease to control and impossible to eradicate. The only reliable preventive measure is to keep cattle separated from potential reservoir species such as wildebeest and sheep by distances of several hundred (ideally 1 000) metres. The risk for development of both wildebeest-associated and sheep-associated MCF diminishes exponentially as the distance of separation between cattle and reservoir hosts increases.

In Africa, MCF is predominantly found where cattle are in close contact with blue- or black wildebeest, while outside Africa, it is usually associated with contact between sheep and susceptible species.