

VMC 321: Systematic Veterinary Virology

Online lecture on the topic

“Malignant catarrhal fever virus”



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Malignant catarrhal fever virus (MCFV)

- **Family** : *Herpesviridae*
- **Sub family** : *Alphaherpesvirinae*
- **Genus**: *Macavirus*



- MCF viruses are usually named after their reservoir hosts.
- **Other Scientific Names**
 - bovid herpesvirus 3
- **International Common Names**
 - **English:** alcelaphine BMC virus; malignant catarrhal fever virus; wildebeest-associated malignant catarrhal fever virus; wildebeest-associated virus
- **English acronym**
 - AHV-1
 - AIHV-1
 - MCFV
 - WA-MCFV

Taxonomic Tree

- Group: "ssDNA viruses"
- Baltimore Group I: "DNA viruses"
- Order: *Herpesvirales*
- Family: *Herpesviridae*
- Subfamily : *Gammaherpesvirinae*
- Genus: *Macavirus*
- Species: Alcelaphine herpesvirus 1

- Alcelaphine herpesvirus 1 (AIHV-1) belongs to the *Macavirus* genus of the *Gammaherpesvirinae* subfamily of the family *Herpesviridae*.
- The macaviruses are lymphotropic herpesviruses that share a common genome structure and are consistently associated with lymphoproliferation

- There are two major groups of MCF viruses
 - i. Alcelaphinae group
 - ii. Caprinae group.

The Alcelaphinae group

- Alcelaphinae/Hippotraginae group of MCF viruses contains
 - Alcelaphine herpesvirus 1 (AlHV-1)
 - Alcelaphine herpesvirus 2 (AlHV-2)
 - hippotragine herpesvirus 1 (HiHV-1)
 - MCFV-oryx.

The Caprinae group includes

- Caprinae group of MCF viruses contains
 - Ovine herpesvirus 2 (OvHV-2)
 - Caprine herpesvirus 2 (CpHV-2)
 - Caprine herpesvirus-3 (CpHV-3, previously called MCFV-WTD)
 - MCF virus-white tailed deer (MCFV WTD)
 - MCFV- ibex
 - MCFV-muskox
 - MCFV-aoudad

The two most important viruses causing MCF are

Alcelaphine herpesvirus 1 (AlHV-1)

- Causes wildebeest-associated MCF; endemic in wildebeest populations causing

Ovine herpesvirus 2 (OvHV-2)

- Causes sheep-associated MCF; endemic in most sheep populations

Cultivation of MCF viruses in cell culture

- OvHV-2 has never been propagated in monolayer culture
- AIHV 1 could be cultivated in cell culture

Malignant Catarrhal Fever (MCF)

“Malignant catarrhal fever is a sporadic disease affecting single cattle but occasionally severe outbreaks can occur in a group of cattle.”

Sources of virus

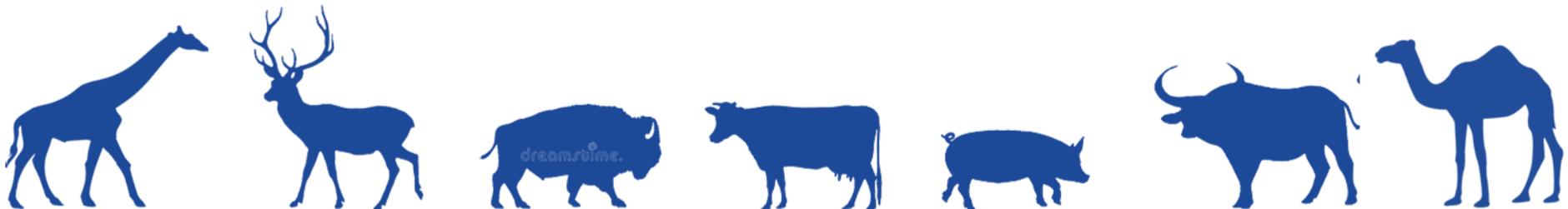
- Nasal and ocular secretions
- Faeces
- Semen

Transmission of MCF-associated viruses

- Transmission of AlHV-1 - vertical and horizontal within wildebeests herds.
- AlHV-1 is transmitted in nasal and ocular secretions, mainly in the cell-free form.
- Transmission of OvHV-2 - only from sheep to susceptible hosts
- OvHV-2 is transmitted by the respiratory route and intermittently in nasal secretions.
- Both viruses may also be found in feces and semen.
- Infection of cattle - through contact with young lambs/sheep.

Susceptible host

- It is principally a disease of Artiodactyla and affects domestic and captive species of families: *Bovidae*, *Suidae*, *Giraffidae*, *Cervidae*, and *Camelidae*
 - domestic cattle
 - water buffalo
 - Bali cattle (banteng)
 - American bison
 - deer



CLINICAL SIGNS

- Affected cattle are
 - Profoundly depressed with a high fever (40.5-42.0°C)
 - Complete loss of appetite and the eyes are severely affected with corneal opacity causing blindness.
 - Affected cattle avoid bright light and sudden exposure to sunlight causes the eyelids to close
 - Copious muco-purulent nasal discharges
 - Encrustation of the surface of the muzzle and nares
 - Diffuse necrosis of the oral mucosa
 - Marked enlargement of all lymph nodes
 - Exudative dermatitis which affects the inner thigh and udder/teats.
 - Diarrhoea

Clinical symptoms

1. Peracute form
2. Intestinal form
3. Head-and-eye form
4. Mild-form

Diagnosis

- Clinical signs
- Gross and histologic lesions
- Laboratory confirmation
- Serology
- Viral neutralization
- Immunoperoxidase
- Immunofluorescence
- Elisa
- PCR - allows sensitive confirmation of the presence of MCF viruses in infected animals

The World Organisation for Animal Health (OIE) recognises histopathology as the definitive diagnostic test

Thank you