

***Airlangga University***

**Faculty of Veterinary Medicine**

Departement of Veterinary Microbiology



**Veterinary Microbiology II:**

**BOVINE EPHEMERAL FEVER  
(BEF)**

————— **Adi Prijo Rahardjo** —————



# BOVINE EPHEMERAL FEVER (BEF)

Synonym :

Three day sickness

Stiff sickness

Bovine epizootic fever

Demam tiga hari (Idn)



Bovine ephemeral fever is an economically important disease in cattle.

Its impact includes lost production

- decreased milk production,
- abortion,
- prolonged recovery in some animals

mortality is usually low,



# Etiology

Bovine ephemeral fever is caused by the bovine ephemeral fever virus (BEFV), a member of the genus *Ephemerovirus* in the family Rhabdoviridae.

There is only one serotype.

Other members of this genus can cross-react in some serological tests. (Adelaide River virus, Kimberley virus, Berrimah virus, Puchong virus and Malakal virus)



## Species Affected

Only cattle (*Bos* sp.) and water buffalo (*Bubalus bubalis*) develop bovine ephemeral fever.

Antibodies to BEFV have been reported in

- domesticated deer and goats and
- many wild ruminants

Experimental infections have been established in sheep.



# Geographic Distribution

Bovine ephemeral fever is endemic in most tropical and subtropical areas of Africa, Australia, the Middle East and Asia.

Some countries have outbreaks in most years; others report cases only during epizootics.

BEFV is not found in Europe, North or South America, or New Zealand.



# Transmission

Bovine ephemeral fever appears to be transmitted by arthropods. (arthropod-borne disease, arbovirus)

The vector/s are not known, but BEFV has been isolated from a mixed pool of:

- Culicine and Anopheline mosquitoes,
- *Anopheles bancroftii* (in Australia)
- *Culicoides* (in Africa and Australia).

Mosquitoes are suspected to be the most important biological vectors.



The disease can also be spread by intravenous inoculation of small amounts of blood.

Bovine ephemeral fever is not transmitted by close contact, body secretions, or aerosol droplets.

Carriers are not known to occur.





# Incubation Period

In experimental infections:

the incubation period developing between  
3 and 5 days after exposure.

The natural incubation period is probably similar.



# Clinical Signs

Bovine ephemeral can be either mild or severe in cattle.

Subclinical infections are also seen. The symptoms vary in individual animals

The classic course begins with a fever, which is often biphasic, triphasic or polyphasic.

The temperature peaks typically occur 12 to 18 hours apart.



During the first fever spike:

milk production in lactating cows often drops dramatically.

Some animals may be depressed stiff or reluctant to move.

Animals become inappetent and depressed

Serous or mucoid discharges from the nose

Profuse salivation

Watery ocular discharge

Muscle twitching .



Some animals develop submandibular or periorbital edema, or edema on the head.

Lameness, stiffness and joint pain are common; the joints may/ may not be swollen.

Most animals lie in sternal recumbency, but in severe cases, may become laterally recumbent.

Some animals temporarily lose their reflexes and are unable to rise.



Most animals recover completely within 2 to 3 days. In severe case may take up to a week to recover.

Generally, animals lose condition rapidly during the illness, and regain their weight only slowly.



In recovered animals, milk production is decreased by 10-15% for the rest of the lactation, but usually returns to normal after subsequent pregnancies.

Death is uncommon, may occur during the febrile or the convalescent stage, usually as result of secondary complications such as pneumonia or trauma

Water buffalo have similar symptoms, but the disease is usually milder. Experimentally infected sheep remain asymptomatic.



## Post Mortem Lesions

small amount of fibrin–rich fluid in the pleural, peritoneal and pericardial cavities.

Fluid may also be found in the joint capsules. Serofibrinous polysynovitis, polyarthritits, polytendinitis, and cellulitis are common.

Petechial hemorrhages or edema may be found in the lymph nodes. Areas of focal necrosis are common in muscle.



# Morbidity and Mortality

Bovine ephemeral fever can occur as localized outbreaks or in seasonal epizootics

The morbidity rate is highly variable, and can be as high as 80% or as low as 1-10%.

Morbidity varies with the age and condition of the animal, as well as any immunity it may have.





The clinical signs are usually more severe in adults than calves;

The mortality rate is 1-2% in most outbreaks, but it can be as high as 30%.



# Diagnosis

## *Clinical*

usually diagnosed clinically during outbreaks in endemic areas.

This disease should be suspected in cattle herds that develop severe symptoms including fever, lameness, temporary paralysis or recumbency.

This disease may be difficult to diagnose when a single animal is affected.



## ***Differential Diagnosis***

Bovine ephemeral fever can be confused with:

- Rift Valley fever, Heartwater,
- Bluetongue, Botulism, Babesiosis or Blackleg.

The salivation may also resemble foot-and-mouth disease, but no vesicles are found.



## ***Laboratory Tests***

Most cases are confirmed by serology. A rising titer should be demonstrated with either virus neutralization or enzyme-linked immunosorbent assay (ELISA);

Complement fixation test, but this test identifies the antibodies only as *Ephemerovirus*-specific.



Polymerase chain reaction (PCR) used regularly for diagnosis.

Virus isolation can be attempted from blood samples, but often fails.

BHK-21 and Vero cells can also be used to propagate the isolated virus.

Identification confirmed by virus neutralization or ELISA; Immunofluorescence may be able to identify the virus only as an *Ephemerovirus*.

Bovine ephemeral fever can also be confirmed by intracerebral inoculation into unweaned mice.



# Control

treating the area with insecticides

In endemic areas, vaccination is generally used to prevent disease.

Vaccination can also be used in the face of an outbreak.

Insect control would be helpful.

