**Guideline for medical interventions**
**Veterinary Medicine**

# Three-Day Sickness (Bovine Ephemeral Fever) in Cattle



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## Acknowledgment

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## Definition

Three-day sickness, also known as Bovine Ephemeral Fever (BEF), is an acute febrile viral disease affecting cattle and water buffalo. The disease is characterized by sudden onset of high fever, stiffness, lameness, muscle tremors, depression, nasal discharge, and a marked reduction in milk production. The disease is generally self-limiting, with most animals recovering within approximately three days, which explains the common name “three-day sickness.”

## Economic importance

Bovine Ephemeral Fever is considered one of the economically important arthropod-borne viral diseases of cattle in tropical and subtropical regions. Outbreaks may result in significant economic losses due to decreased milk yield, loss of body condition, reduced draft power, infertility, abortion in severe cases, and occasional mortality.

## Etiology

Bovine Ephemeral Fever is caused by the Bovine Ephemeral Fever Virus (BEFV), which belongs to:

Order: Mononegavirales. Family: Rhabdoviridae, Genus: Ephemerovirus

The virus is Enveloped, Bullet-shaped, Single-stranded negative-sense RNA virus

The virus is sensitive to: Heat, Lipid solvents, Detergents, and Disinfectants

However, it survives for short periods in blood and vectors.

## Geographic Distribution

The disease occurs mainly in Africa, Middle East, Australia, and Asia

Outbreaks are commonly associated with warm seasons and increased insect vector activity.

## Transmission

### Vector-Borne Transmission

BEF is transmitted primarily through blood-feeding arthropods.

**Important vectors include:**

Mosquitoes (Culex and Aedes species) - Culicoides biting midges

### Factors Favoring Transmission

Warm temperatures

High humidity

Heavy rainfall

Presence of standing water

Large vector populations

Direct transmission between animals is considered insignificant.

## Susceptible species

Cattle and water buffalo are the h**ighly Susceptible**

Sheep and goats are usually resistant.

### Morbidity

Morbidity may range from 30–100%.

## Mortality

Mortality is usually low (1–2%). Increasing mortalities could occur in:

- High-producing dairy cows
- Pregnant animals
- Bulls

## Seasonal Occurrence and risk facotors

The disease commonly occurs during summer and early autumn

### Risk Factors for three-day sickness

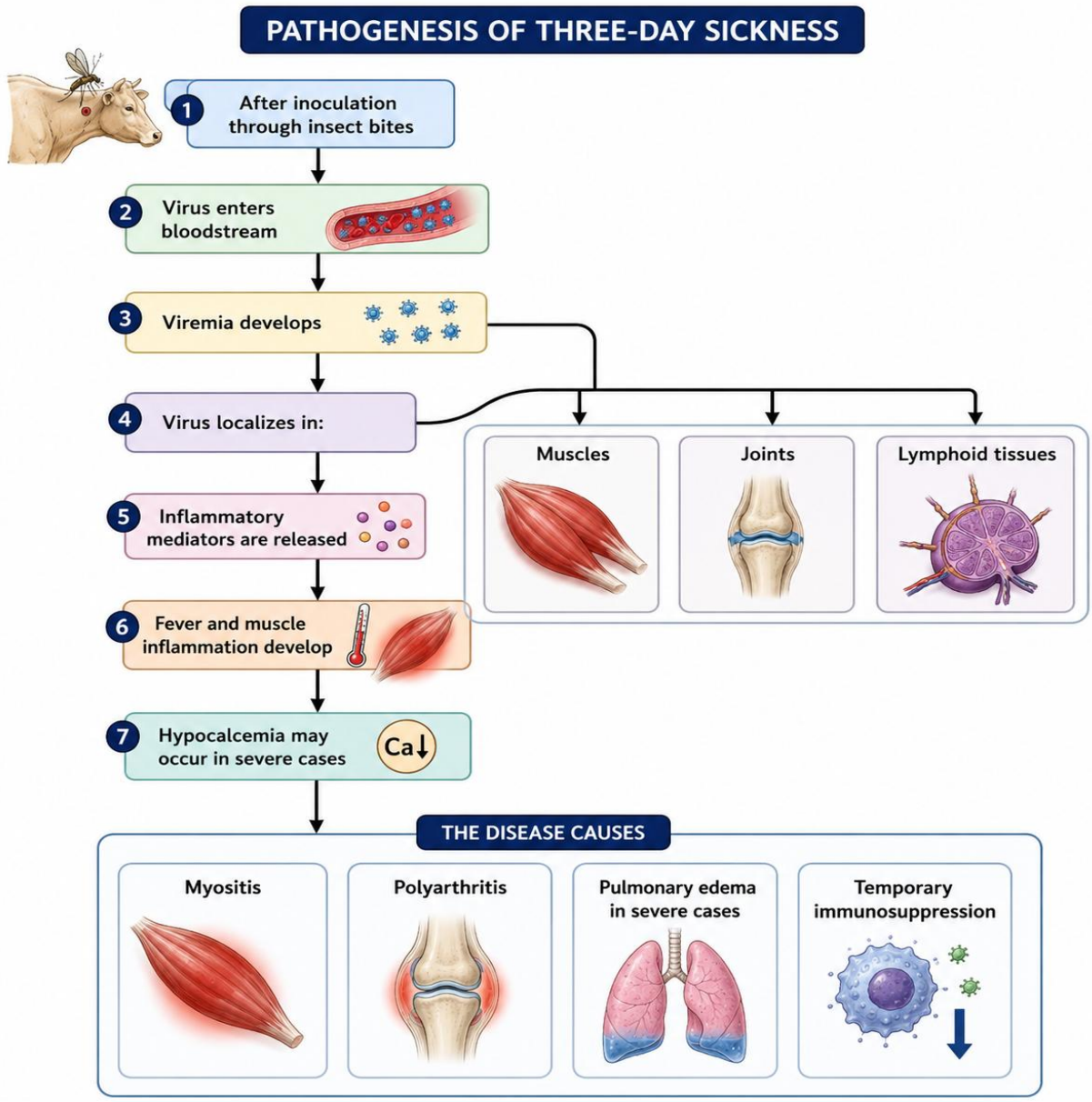
- High vector density
- Introduction of susceptible cattle
- Climatic changes
- Lack of vaccination

## Pathogenesis

After inoculation through insect bites:

Virus enters bloodstream, viremia develops then virus localizes in muscles, joints, and lymphoid tissues. Inflammatory mediators are released, fever and muscle inflammation develop. Hypocalcemia may occur in severe cases.

The disease causes: myositis – polyarthritis - pulmonary edema in severe cases and immunosuppression




**Pathogenesis of three-day sickness**

## Clinical Signs

### Incubation Period

Usually 2–4 days.

### Peracute Signs

Sudden onset of fever (40–41.5°C)

Severe depression

Anorexia

Sudden drop in milk production

**Acute Signs**

**General Signs**

Stiffness, reluctance to move, muscle tremors, shifting lameness, arched back and recumbency

**Respiratory Signs**

Nasal discharge, Salivation, Tachypnea, Dyspnea

**Musculoskeletal Signs**

Swollen joints, Muscle pain, Difficulty rising, Paralysis in severe cases

**Gastrointestinal Signs**

Ruminal stasis, Constipation followed by diarrhea

**Reproductive Effects**

Temporary infertility, Occasional abortion

**Recovery Phase**

Most animals recover withi 1–3 days. Some animals may require several weeks for complete recovery.

## Clinical Forms

**Mild Form**

Transient fever- Mild stiffness- Quick recovery

**Severe Form**

Recumbency - Respiratory distress- Pulmonary emphysema -Secondary complications

### Fatal Form

Rare but may occur due to respiratory failure, Secondary pneumonia

## Gross Lesions

Postmortem findings may include:

- Congestion of muscles
- Serofibrinous fluid in joints
- Pulmonary edema
- Emphysema
- Enlarged lymph nodes
- Congestion of internal organs

In many cases lesions are mild or absent.

## Histopathological Lesions

Microscopic lesions include:

- Degeneration of skeletal muscles
- Muscle fiber necrosis
- Edema
- Mononuclear cell infiltration
- Synovitis
- Pulmonary congestion

## Diagnosis

**Tentative Diagnosis is b**ased on:

Sudden fever, Lameness, Rapid recovery, Seasonal occurrence, Herd outbreaks

## Laboratory Diagnosis

### Samples

- Blood during febrile stage
- Serum samples
- Tissue samples

## Diagnostic Tests

### 1. RT-PCR

Most sensitive method for viral detection.

### 2. Virus Isolation

Performed in Cell culture - Suckling mice

### 3. Serological Tests

- ELISA
- Virus neutralization test
- Complement fixation test

### 4. Hematology: may show:

- Leukopenia
- Neutrophilia
- Hypocalcemia

## Differential Diagnosis

| Disease | Distinguishing Features |
|---|---|
| Foot-and-Mouth Disease | Vesicles in mouth and feet |
| Milk Fever | Hypocalcemia without fever |
| Blackleg | Crepitating muscle swelling |
| Rabies | Nervous signs and aggression |
| Traumatic Reticuloperitonitis | Pain localized to reticulum |
| Bovine Respiratory Disease | Severe respiratory involvement |
| Ketosis | Nervous signs and ketone odor |

## Treatment

There is no specific treatment.

### Symptomatic and Supportive Therapy

### 1. Anti-inflammatory Drugs

- Flunixin meglumine, Ketoprofen, Meloxicam

to alleviate fever, pain and Inflammation

### 2. Calcium Therapy

Intravenous calcium borogluconate is beneficial in recumbent animals.

### 3. Fluid Therapy

Used in dehydrated animals.

### 4. Antibiotics

Used to prevent secondary bacterial infections.

### 5. Nursing Care

- Soft bedding
- Frequent turning of recumbent animals
- Easy access to feed and water

## Prevention and Control

### Vector Control

- Insecticides
- Elimination of standing water
- Mosquito control programs
- Housing animals during peak vector activity

### Vaccination

vaccination is considered the best preventive measure in endemic regions. different types of vaccines can be used including live attenuated vaccines- inactivated vaccines

### Biosecurity Measures

- Restrict animal movement during outbreaks
- Quarantine new animals
- Surveillance programs

## Prognosis

### Favorable Prognosis

Most animals recover completely within a few days.

**Poor Prognosis usually a**ssociated with:

- Prolonged recumbency
- Respiratory complications
- Secondary infections

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