

Bluetongue (BT)

What is Bluetongue (BT)?

Bluetongue (BT) is a non-contagious, viral disease affecting domestic and wild ruminants (primarily sheep and including cattle, goats, buffalo, antelope, deer, elk and camels) that is transmitted by insects, particularly biting midges of the *Culicoides* species.

The virus which causes BT is identified as a member of the *Reoviridae* family.

Twenty-four (24) different serotypes have been identified and the ability of each strain to cause disease varies considerably.

The severity of disease varies among different species with symptoms being most severe in sheep resulting in deaths, weight loss and disruption in wool growth. In highly susceptible sheep, morbidity can be as high as 100%. Mortality averages from 2-30% but can be as high as 70%.

Cattle often have a higher infection rate than sheep and demonstration and severity of clinical signs varies depending on the strain of virus. Currently circulating BT virus in Northern Europe is epidemiologically significant because of demonstration of clinical signs in cattle.

In countries where BT is endemic the impact is largely on loss of trade due to restrictions and the costs of surveillance, health testing and vaccination.

BT is a disease listed under the OIE *Terrestrial Animal Health Code* and must be reported to the World Organisation for Animal Health (as per the OIE *Terrestrial Animal Health Code*).



Where is the disease found?

BT has a significant global distribution in regions where the insect vector (i.e. biting midges species *Culicoides*) is present, including Africa, Asia, Australia, Europe, North America and several islands in the tropics and subtropics. The virus is maintained in areas where the climate will allow biting midges to survive over winter.

There are more than 1000 species of *Culicoides* species but less than 20 are considered competent vectors of BT virus. The geographical distribution of the insect vector species therefore generally limits the distribution of the disease.

Generally, sheep found in areas where the disease is endemic are naturally resistant to BT. Outbreaks occur when susceptible sheep, particularly European breeds are introduced to endemic areas, or when the virus is introduced to a region by windborne movement of infected *Culicoides*. Occurrence of BT generally parallels vector activity surging during periods of high temperature and rainfall and subsiding with the first frost or severe cold weather.

How is the disease transmitted and spread?

The insect vector is the key to transmission of BT virus between animals. Vectors are infected with BT virus after ingesting blood from infected animals. Without the vector, the disease cannot spread from animal to animal.

BT virus transmission can occur throughout the year, particularly during rainy periods. Infected cattle play a significant role in maintaining the virus in a region. Cattle may serve as a source of virus for several weeks while displaying little or no clinical signs of disease and are often the preferred host for insect vectors.

The virus has been found in semen from infected bulls and rams and can be transmitted to susceptible cows and ewes but this is not a significant mechanism of transmission. Virus can also be transferred through the placenta to the fetus.

The BT virus is not transmitted through contact with animals, wool or consumption of milk.



What is the public health risk associated with this disease?

There is no public health risk associated with BT.

What are the clinical signs of the disease?

In infected sheep, clinical signs vary and can include:

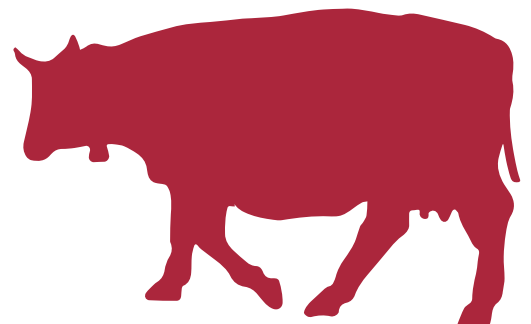
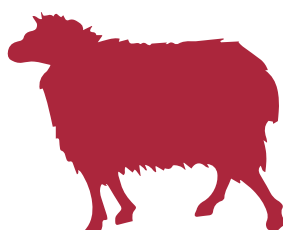
- fever;
- hemorrhages and ulcerations of the oral and nasal tissue;
- excessive salivation, and nasal discharge and swelling of lips, tongue, and jaw;
- inflammation of the coronary band (above the hoof) and lameness;
- weakness, depression, weight loss;
- profuse diarrhea, vomiting, pneumonia;
- ‘blue’ tongue as a result of cyanosis (rare);
- pregnant ewes may abort;
- may have ‘break’ in wool growth in recovering sheep resulting in partial or complete loss of wool.

The appearance of clinical signs in cattle will depend on the strain of virus; other domestic ruminants such as goats generally show few or no clinical signs.

More detailed information is available in the OIE Bluetongue Technical Disease Card www.oie.int/en/animal-health-in-the-world/technical-disease-cards/.

How is the disease diagnosed?

BT may be suspected based on typical clinical signs, prevalence of required insect vectors and particularly in areas where the disease is endemic. Laboratory tests are required to confirm the diagnosis. (OIE *Terrestrial Animal Health Code* and OIE *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*).



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What is being done to prevent or control this disease?

Prevention and control measures.

In endemic areas, sentinel monitoring programs actively sample animals in sentinel herds to monitor for presence of the virus. In combination with active surveillance programs to identify location, distribution and prevalence of insect vectors in an area, control measures can be implemented in a timely fashion such as:

- identification, surveillance and tracing of susceptible and potentially infected animals;
- quarantine and/or movement restrictions during insect activity period;
- identification of specified zones;
- vaccination; and
- insect control measures.

Vaccination is used as the most effective and practical measure to minimize losses related to the disease and to potentially interrupt the cycle from infected animal to vector. It is essential to use a vaccine designed to provide protection against the specific strain (or strains) of virus of concern in a particular area.



More Information?

References:

1. OIE *Terrestrial Animal Health Code*:
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2. OIE *Manual of Diagnostic Tests and Vaccines for Terrestrial Animal*:
www.oie.int/en/international-standard-setting/terrestrial-manual/access-online/
3. OIE Technical Disease Card:
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4. The Center for Food Security and Public Health, Iowa State University
www.cfsph.iastate.edu/
5. Merck Veterinary Manual:
www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/toc_50000.htm
6. *Atlas of Transboundary Animal Diseases Animales Transfronterizas*
P. Fernandez, W. White;
Ed.: 2011

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Key Facts

- **Bluetongue** was first described in South Africa where it was likely endemic in wild ruminants.
- **Outbreaks of bluetongue in Cyprus in 1943** caused between 60 and 70% losses in some flocks.
- **Outbreak in Portugal and Spain in 1956** due to a virulent strain of the virus caused death of 46,000 sheep in Portugal and 133,000 in Spain.
- **The first occurrence of the disease in the Netherlands August, 2006** signifies the most northern locality where the disease has ever been diagnosed. Subsequent outbreaks in other northern European countries shared the following significant epidemiological factors: the northern latitude, clinical signs in cattle, regionally prevalent insect vector that was capable of withstanding European winters.

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