

Bluetongue in cattle

Bluetongue, a viral infection caused by a member of the Orbivirus genus (Reoviridae family) and transmitted by *Culicoides sp.* insects (midges), has been known to occur in the northern areas of the Northern Territory since the 1970s. Infection of cattle by this virus has not been known to cause any clinical symptoms in Australia, but sheep under experimental conditions can suffer severe illness. The disease has never been reported from sheep farming areas in Australia.

Figure 1: Electron micrograph photo of a *Culicoides* midge that transmits bluetongue virus



The disease is interesting for several reasons. There are at least 5 different species of midges that transmit the disease in Australia. These species have varying ideal environmental conditions and also different levels of competence transmission of the bluetongue virus. Additionally, the virus itself exists in several forms or serotypes. Some serotypes will cause more severe disease than others and the different serotypes also vary in persistence of infection. Thirteen of the 29 serotypes identified throughout the world have been found in the Top End of the Territory. Only 4 of these have been found in eastern Australia, and only 3 of them in New South Wales.

In the Territory, the Department of Industry, Tourism and Trade's Livestock Biosecurity Branch participates in the national arbovirus monitoring program (NAMP), which is managed by Animal Health Australia. This national program monitors the distribution of economically important livestock viruses transmitted by insects. The program is jointly funded by industry and government. Much of the data for NAMP is collected from cattle located in sentinel herds throughout the country.

A sentinel herd is a small group of identified cattle (usually 10 to 20 head) that are examined at regular intervals throughout the year for the presence of viruses. A blood sample is taken at intervals varying from once per week (at one site only), to monthly at most sites, to 4 times per year. Sentinel herds for bluetongue are maintained at several locations in the Territory to provide early warning of entry of new bluetongue serotypes to Australia and to give an indication of the seasonal spread of bluetongue. Sentinel cattle herds are maintained in all states of Australia to indicate whether bluetongue could spread to sheep-raising areas in any particular season.

The sentinel cattle herds in the Territory are replaced annually with young animals that have not been exposed to bluetongue viruses. They are usually bled at least every month and the blood samples are tested for bluetongue antibodies (antibodies indicate exposure to the bluetongue virus).

The sentinel herd at Beatrice Hill Farm, which is bled every week, and the herds at Douglas Daly Research Farm which are bled monthly, have animals that have shown sero-conversion (that is, become antibody positive) almost every year. Sentinel herds at Victoria River Research Station and Katherine Research Station have animals sero-converting only in some years. The sentinel herds at the Arid Zone Research Institute in Alice Springs have never had an animal sero-convert for bluetongue virus since sentinel herds were first bled there in 1989.

This pattern shows that bluetongue is restricted to the northern part of the Territory, in areas that suit the insects transmitting the virus. It also shows that the extent of the bluetongue virus spread varies from season to season.

Some international export protocols for cattle have restrictions with respect to the geographical source of cattle, owing to the presence of bluetongue. Information from the sentinel herds, supported by information from other surveys, can be used to demonstrate zones where disease such as bluetongue does not occur at that time, or where the disease occurs at high or low levels. Such information assists in negotiations with other countries regarding import/export protocols.

More information on the NAMP can be found at <https://namp.animalhealthaustralia.com.au/>