

Bluetongue in Cattle

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Bluetongue, a viral infection caused by a member of the Orbivirus genus (Arbovirus 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 the sheep farming areas in Australia.



Scanning electron microscope photo of a *Culicoides* insect

The disease is interesting for several reasons. There are at least four different species of midges that transmit the disease in Australia; and these species have varying ideal environmental conditions and also different levels of competence in 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. Eight of the 24 serotypes identified throughout the world have been found in the Top End of the Northern Territory. Only two of these have also been found in eastern Australia.

The Department of Primary Industry, Fisheries and Mines 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 that are transmitted by insects. The program is funded jointly by industry and government. Much of the data for NAMP are 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) which are examined at regular intervals throughout the year for the presence of disease. A blood sample is taken at intervals varying from once per month to three times per year. Sentinel herds for bluetongue have been kept at several locations in the Northern Territory since the 1970s 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 seems to be spreading to sheep raising areas in any particular season.

In the Northern Territory, the sentinel cattle herds are replaced annually with young animals that have not been exposed to bluetongue virus. 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 herds at Beatrice Hill Farm have animals that have shown sero-conversion (i.e. become antibody positive) every year (with the exception of 1990). The herds at Berrimah Research Farm have animals sero-converting 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 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 Northern Territory - areas which suit the insects transmitting the virus. It also shows that the extent of the bluetongue virus spread varies from season to season.

Some export protocols for cattle have restrictions as regards the source of cattle, due 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, 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 www.namp.com.au

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Department of Primary Industry, Fisheries and Mines

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ISSN 0157-8243

Serial No. 748

Agdex No. 420/653

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