Tick Fevers of Cattle

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INTRODUCTION

For a description of the cattle tick, refer to Agnote K39 (721) titled *The Cattle Tick*. Similarly, for information on the life cycle of tick fever parasites, refer to Agnote K31 (696) titled *Life Cycles of the Tick Fever Parasites*.

Figure 1 and 2. Cattle ticks on the brisket of a Brahman cross animal. Photos courtesy of Sharon Kearney.

Two types of tick fever are found in cattle in the Northern Territory (NT):

- Bovine babesiosis - commonly known as tick fever or red water.
- Anaplasmosis.

Both are called tick fever because the microscopic parasites which cause them are transmitted to cattle by cattle ticks.

Note: Tick fever is a notifiable disease in the tick free areas of the NT. There are legislated movement restrictions for cattle to prevent the spread of cattle ticks to tick-free areas and associated tick-borne diseases.

Tick fever cases are rarely reported from endemic tick areas. However in recent years with a number of dry seasons and a major change in breed composition, there has been a major decline in the presence of ticks and in their burden on cattle. This has led to concern about a lack of protection against tick fever in native cattle in the southern part of the tick endemic area because of an inadequate exposure to the disease. It is suspected that tick fever may be enzootically unstable (i.e. not constantly present). Consequently, stock from this area may be susceptible to tick fever if ticks re-establish during better seasons, or are exported to South-East Asia, or are moved to properties in higher rainfall areas which have a higher tick burden.

NORTHERN TERRITORY GOVERNMENT

In a survey carried out in 1996 it was found that:

- Overall, there was a lower level of antibodies to *Babesia bovis* in the tick-endemic area than expected.
- There was a low level of antibodies to *B.bovis* in the southern parts of the tick-endemic area.
- Generally, there was a positive association between higher rainfall and higher levels of antibodies to *B. bovis* and *Anaplasma marginale*.

1. BOVINE BABESIOSIS

CAUSE

In Australia, babesiosis is caused by two species of *Babesia*, which invade and destroy red blood cells in cattle.

They are: *B. bovis* (formerly known as *B. argentina*); and
B. bigemina is common but rarely causes disease.

METHOD OF INFECTION

Both *Babesia* species are carried by the cattle tick (*Rhipicephalus microplus*) and pass from the infected female adult tick through her eggs. The eggs hatch into larvae, transform into nymphs and subsequently become adults.

B. bovis is transmitted to cattle by tick larvae when grazing. *B. bigemina* is transmitted by nymphs and adult ticks, but not larvae. This results in a time difference between the onset of the two infections and the appearance of the parasites in the blood stream. The time period is as shown below:

B. bovis	8 to 10 days.
B. bigemina	13 to 14 days.

SUSCEPTIBILITY

Calves in tick areas are initially resistant to clinical disease due to the consumption of colostrum from their dams. This is followed by mild or in-apparent disease if infected from six to eight months of age. The resistance will disappear by nine months of age unless the calves have been exposed to infected ticks.

Of all cattle, bulls older than one year are the most susceptible, with yearling cattle being the next most susceptible. Excessively fat cattle, or those in poor condition, do not survive as well as cattle in good condition.

Zebu and Africander cattle have a stronger natural resistance to *B. bovis* than do British breeds and the Santa Gertrudis breed. It is suspected that non-immune Brahman cattle may also become infected but clinical disease and death are not common.

Some cattle, which have recovered from an attack of babesiosis, remain carriers and are the major source of re-infection. The period of protection following natural infection is unknown, but is thought to be at least four years and appears to be life-long. It was previously thought that continuing re-infection was needed to maintain immunity. Cattle will definitely remain immune to tick fever where ticks are plentiful because of continual re-infection.

CLINICAL SYMPTOMS

- Sudden development of fever - temperature around 41° C (106° F). The fever stage usually lasts about a week.
- Loss of appetite and rumination (chewing of cud) ceases.
- The animal isolates itself from the herd; it is disinclined to move and stands with the head lowered and ears drooping.
- The coat may appear ruffled, breathing becomes rapid and jerky and heart beat is accelerated.
- The mucous membranes of the eyes, nose and mouth become yellow due to anaemia and jaundice.
- The animal exhibits incoordination of the hindquarters, muscle shivering and a tendency to charge when disturbed.
- Emaciation occurs.
- The animal passes red coloured urine.
- Most deaths occur in the third week, but may occur any time after 24 hours of infection. Death may be precipitated by exertion or excitement.

The death rate of fully susceptible animals (European breeds from tick-free areas) is at least 20%; the death rate in susceptible Brahman cattle is thought to be less than 1%.

POST-MORTEM FINDINGS

You are advised to contact your local Livestock Biosecurity Officer or veterinarian if you suspect tick fever. By carrying out a post-mortem examination, they will be able to provide a definite diagnosis for the presence or absence of tick fever in your herd.

The symptoms a veterinarian will expect to find for tick fever include:

- Yellow mucous and serous linings with small haemorrhages.
- An enlarged and bronze coloured liver.
- A distended gall bladder, usually filled with coagulated, dark green bile.
- An enlarged spleen with its contents resembling black-currant jam.
- Red congested kidneys, swollen with blood.
- A distended bladder with dark coloured urine.

These symptoms vary with the acuteness and severity of the disease.

The presence of Babesia is confirmed by microscopic examination of peripheral blood, brain and kidney samples from infected animals. This examination can be done at the Berrimah Veterinary Laboratories in Darwin.

TREATMENT

Successful treatment depends on early diagnosis and prompt administration of effective drugs. Inject Imizol® subcutaneously at the rate of 1 mL/100 kg live body weight. Cattle due for slaughter within 28 days for human consumption should **NOT** be treated with Imizol®.

It is important not to move or excite sick animals. They should be provided with shade, shelter and easy access to good feed and water.

2. ANAPLASMOSIS

Anaplasmosis is caused by the microscopic parasite *Anaplasma marginale*.

METHOD OF INFECTION AND SUSCEPTIBILITY

Most of what has been said above about babesiosis applies to anaplasmosis.

The following are the differences between the two:

- The incubation period for anaplasmosis is three to six weeks.
- Anaplasmosis increases in severity with the age of the animal.
- Body temperature during the early stages of infection rarely reaches 40.5° C. Temperatures also either remain high for several days then return to normal or alternate for up to a fortnight between high and normal (38.5° C).
- Animals do **NOT** pass red urine.
- Recovery is slower.
- Treatment is with Imizol® injected subcutaneously at the rate of 2.5 mL/100 kg live body weight.
- Clinical anaplasmosis has been observed in Brahman cattle in the NT.

There appears to be no difference in resistance to infection by anaplasmosis between Brahman and European breeds; Brahman cattle are more resistant to babesiosis.

3. THEILERIOSIS

Theleria is another protozoal parasite that may also cause tick fever. The potential vectors and taxonomic status of the different types of Theileria organisms present in Australia are uncertain. The cattle tick is not believed to be a vector of this protozoan; however, species of *Haemophsalis* tick are known vectors. *H. longicornis* (bush tick or New Zealand cattle tick) and *H. bancrofti* (wallaby tick) are known vectors, but are **not known to occur in the NT**. To date, most cases of theileriosis have been observed in NSW. Here field veterinarians have had to change their paradigm regarding theileriosis—moving from regarding *T. buffeli* as an innocuous protozoan, commonly present as an incidental finding, to a cause of significant disease.

While infection is usually benign, under suitable conditions theileriosis is characterised by anaemia, abortion and death.

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ISSN 0157-8243
Serial No. 713
Agdex No. 420/663

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