Bovine anaemia and *Theileria orientalis* group (BATOG)

*Theileria orientalis*, the blood parasite that causes ‘benign theileriosis’, has been present in Australia for more than 100 years. It is established in coastal regions of eastern Australia. Historically it has rarely caused disease.

Since late 2005 there has been an increase in the number and severity of disease cases due to *Theileria orientalis* infection in cattle in eastern Australia and disease has been seen in areas where it had not previously been found.

DNA testing of the *Theileria* parasites in these cases revealed the presence of strains previously undetected in Australia. Further research has shown that one of these variants, called ‘*Theileria orientalis* Ikeda’, is responsible for the change in severity of the infection. The new disease syndrome is called ‘bovine anaemia due to *Theileria orientalis* group’ (BATOG) or ‘oriental theileriosis’ because new strains in this group of organisms are involved.

BATOG was first detected in Western Australia’s Lower Great Southern in May 2013 and since then has also been found in South-West WA. Testing has shown the ‘Ikeda’ strain of the organism is responsible for cases of the disease in WA.

A survey in the Denmark shire over the summer of 2014-15 revealed that about 50% of sampled cattle farms were infected with the ‘Ikeda’ organism. Some farms reported considerable cow losses and abortions when the disease was first detected, while on other infected farms no disease was noticed. It is thought that the more severe signs on some farms were the result of the first exposure to BATOG coinciding with calving.

BATOG does not have any market access or human health implications.

**How does BATOG spread?**

The bush tick (*Haemaphysalis longicornis*) is considered the main carrier (vector) in Australia. The bush tick is mainly a parasite of cattle, but readily infests many other warm-blooded animals including other livestock, wildlife, birds, dogs and cats.

The bush tick is a three-host tick, with each of the three life-cycle stages attaching to a host. Adult ticks are seen mainly during early summer, larvae from late summer to early winter, and nymphs, which are small and hard to detect, mainly in spring. Bush ticks can survive through WA winters.

The most common sites of attachment on cattle are around and beneath the tail head, between the hind legs and udder skin folds, extending underneath to the elbows and escutcheon. In heavy infestations they are also found on the ears. The presence of bush ticks on cattle does not automatically mean that the herd is infected with BATOG.

Cases of BATOG have occurred where no evidence of bush tick infestation has been found but it is difficult to confirm the presence of low numbers of ticks.

**Bush tick habitat**

Bush ticks survive in cool, moist areas where there is shade with protection from desiccation provided by over and understorey plants.

The bush tick typically prefers areas where some rain falls year-round and summer temperatures are not excessive, such as south coastal areas in WA. Short, open pasture away from the coast is usually too dry over summer to permit survival of the free-living stages.

The distribution of the bush tick in WA is known to include the lower Great Southern and South-West.

**Which stock are most affected by BATOG?**

Late-pregnant, recently calved cows, aged cows and young calves are most severely affected by BATOG. Usually only a few cows show evidence of disease but all cows may be infected and most develop immunity without being visibly affected.

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As the tick cannot be controlled in the environment, BATOG will occur within the distribution of the tick. Movement of infected cattle may speed up the movement of BATOG but movement can also occur via ticks on wildlife.

Serious disease can still be seen in areas where the parasite is established when naïve cattle are introduced from outside the district. Conversely, farms outside endemic areas that introduce cattle with ticks from regions with the disease run the risk of the bush ticks spreading the disease to the home cattle. Whether the ticks establish on the farm or not depends on the local environmental conditions.

Animals remain infected for life and disease can re-emerge during periods of stress, particularly around late pregnancy or calving.

**Signs of BATOG**

Disease is associated with the destruction of red blood cells. Young cattle (2–3 months old), late-pregnant and recently calved cows are most likely to be affected by BATOG.

More common signs, particularly in late pregnancy or early lactation, include:

- weakness from anaemia
- fever
- red urine
- jaundice (e.g. yellowing of eyes, gums, vulva)
- late-stage abortions and premature births
- death.

Other signs include:

- listlessness
- lack of appetite, weight loss
- wobbly gait
- laboured breathing.

**What do I do if I suspect BATOG in my cattle?**

If you suspect your cattle may have BATOG, call your private veterinarian or your Department of Agriculture and Food, Western Australia (DAFWA) Field Veterinary Officer. They will ask for a history of the cattle, examine them and take appropriate samples.

DAFWA veterinarian contact details are:

**Albany:** Dr Andrew Larkins, 9802 8530 or 0438 610 437, andrew.larkins@agric.wa.gov.au

**Bunbury:** Dr Kevin Hepworth, 9780 6282 or 0457 599 016, kevin.hepworth@agric.wa.gov.au

It is important to have a vet take samples for laboratory testing so that the disease can be correctly diagnosed – it may not be BATOG.

**Treatment of BATOG**

There are currently no drugs registered for the treatment of BATOG in Australia.

In general, antibiotics as a treatment for acute cases have not been found to be effective.

Treatment with Imidocarb has not been effective. A treatment registered overseas (Buparvaquone) is not available in Australia because of the persistence of the chemical residues in the meat and the impact it would have on our beef markets.

The best option is to provide nursing support to the affected cattle:

- Do not move affected cattle and minimise stress.
- Provide good food, fresh water and shade.
- Multivitamins may also be beneficial.

Owners may wish to treat anaemia in valuable animals with blood transfusions.

**Management in BATOG areas**

Maintaining a healthy herd by implementing good management practices is essential to minimise the effect of BATOG on your herd.

Management plans can be made in consultation with your private veterinarian.

Pay particular attention to:

- maintaining good nutrition
- providing appropriate mineral supplementation (e.g. copper, cobalt and selenium) – see the DAFWA website agric.wa.gov.au for information on cobalt, copper and selenium deficiencies
- keeping the vaccination program up to date (e.g. vibrio, leptospirosis, bovine viral diarrhoea virus – see agric.wa.gov.au and search on ‘cattle vaccines’)
- strategic drenching and parasite control
- close monitoring of cattle (particularly before and during calving)
- treatment and management of clinically unwell cattle.

Attempts to control ticks on cattle are not expected to be effective in preventing BATOG as ticks spend most of their life on pasture and are hard to detect in the immature stages.
Tick control may be considered when individual animals are suffering from blood loss due to the number of ticks.

**Cattle movement in BATOG areas**

When purchasing new cattle, it is important to assess what region they are being purchased from and the risk of them contracting BATOG when they arrive on your property.

Naïve cattle are likely to be the most severely affected animals if they contract BATOG. You may wish to ensure cattle are purchased as replacement heifers with time to be exposed to local diseases and develop immunity prior to becoming pregnant.

When selling or moving cattle to properties outside BATOG areas, animals should be treated prior to movement with a minimum of a macrocyclic lactone (ML) or combination drench and an insect growth regulator (IGR) to reduce the movement of ticks with the cattle.

Cattle destined for abattoirs or saleyards should not be treated as the withholding period (WHP) of any product used must be observed.

**Subsidised laboratory testing supports market access**

If your cattle show signs of illness similar to BATOG, it is important to have a vet investigate and take laboratory samples so that the disease can be diagnosed correctly.

DAFWA subsidises veterinary investigations and laboratory testing where there are livestock diseases with high stock losses or similar disease signs to an exotic or reportable disease in order to protect Western Australia’s $2 billion livestock product and livestock export market. Contact your DAFWA Field Veterinary Officer for more information.

Testing may also show if there are any other concurrent diseases affecting cattle health.

**The vital role of producers in exotic disease detection**

Producers play a vital role in the early detection of exotic diseases in Australia. If you see:

- unusual disease signs
- abnormal behaviour
- unexpected deaths

in your stock, ring your local veterinarian, DAFWA Field Veterinary Officer or the Emergency Animal Disease hotline on 1800 675 888.

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