Bovine ephemeral fever: Three Day Sickness

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Peter Kirkland Senior Principal Research Scientist Elizabeth Macarthur Agricultural Institute Menangle and Graham Bailey Cattle Health Coordinator Animal Biosecurity and Welfare Orange

Bovine Ephemeral Fever (BEF) is a viral disease of cattle and buffalo. Typically, affected animals are only sick for a few days, hence the alternative name - Three Day Sickness.

Clinical signs

There is a sudden onset of fever- as high as 41^0C compared with the normal temperature of about 38^0C. The temperature returns to normal within 36 hours. The first sign in milking cows is a sudden and severe drop in milk production. Cows in advanced pregnancy may abort several weeks later. This is probably because of the fever, rather than a specific effect of the virus.

Animals stop eating and drinking and become depressed. They usually drool saliva, develop a stringy nasal discharge, and may have watery eyes.

Affected animals may shiver, become very stiff with a shifting lameness and are reluctant to move. Lameness in one limb only is a common feature but may not become apparent until the second day of illness. The joints may appear swollen and sometimes there is swelling around the jaw. Heavily conditioned stock are more severely affected and may lie down and refuse to move.

The virus can affect the nerves that control swallowing. This means that affected animals are at risk getting food, water or saliva into the lungs. This can result in pneumonia.

By day three the affected animal is usually standing again and will begin to eat. However, lameness and weakness may last for another two or three days.

Milk production usually drops by at least 50% in sick cows. In dairy herds it is the highest producing animals that are usually the most severely affected. Yield should return to normal after about three weeks, but cows affected late in lactation often dry off. Mastitis sometimes develops, with a marked rise in the somatic cell count.

Bulls and fat cows tend to show more severe signs than other cattle. Such animals lose condition rapidly and are slow to regain their body weight. A proportion of bulls will suffer temporary infertility lasting from three to six months because of the high fever. Permanent infertility is uncommon but can occur.

In the vast majority of cases the disease runs a short course, followed by rapid and complete recovery. However, the disease can vary in severity. Some animals may show only slight symptoms for about 24 hours, while a small number may stay down for many weeks. The disease is usually milder in calves under 12 months of age or lighter conditioned stock.

A small proportion of animals that go down may suffer a permanent paralysis due to damage to the spinal cord- either as a direct effect of the virus, or due to injuries if they fall awkwardly or struggle to regain their feet.

Although most of the herd can be affected, deaths from ephemeral fever are uncommon and rarely involve more than 1% of the herd. Death is usually the result of misadventure, pneumonia or being down for a long period. Economic losses occur from loss of body condition, loss of milk production, abortions or reduced fertility in bulls during the joining season.

How is BEF spread?

BEF is an example of an arbovirus because it is spread by biting insects. The most likely insects to transmit the virus in NSW are mosquitoes, such as *Culex annulirostris* but there may be other vectors that have not been identified.

The distribution of these insects varies with climatic conditions, and this in turn will influence the pattern of disease spread and time of occurrence.

Where does the disease occur?

BEF has become established in parts of eastern Australia, with localised outbreaks occurring on the north coast of NSW, or in the Hunter Valley. Depending on the seasonal conditions, the disease then spreads from these centres. Sometimes there is a north-south moving wave of infection from Queensland through NSW but this is now uncommon. The usual pattern consists of sporadic cases for one or two years followed by an outbreak.

Cases in inland NSW are much less common but occasional outbreaks can occur in the north west of the State - usually associated with spread from Queensland. The disease is rare in southern NSW and Victoria but occasional cases have been observed.

When does it occur?

BEF usually occurs between January and April, with the greatest number of cases in March. Outbreaks often follow periods of heavy summer rainfall. However, cases can occur from December through to early June. Cases in the winter or spring months, even in coastal districts, are rare.

Diagnosis

When an outbreak occurs in unvaccinated cattle not previously exposed to the virus, a diagnosis of BEF can often be made based on clinical signs and the brevity of illness.

However, when most animals are immune and occasional cases occur, or when there are cases in areas where the disease occurs less frequently, laboratory confirmation of the cause of illness may be required. In the past, this is done by taking two blood samples - one during the very early stages of the illness, and another at least three weeks later. If BEF is responsible, BEF antibody levels will be much higher in the second test than in the first, but this takes a long time to obtain results. The preference now is to use the polymerase chain reaction test (PCR), which can provide results within 24 hours of receipt at the laboratory. Confirming BEF by PCR allows specific treatment to be administered. However, it is essential for a blood sample to be collected within 2 days of the first signs of disease.

Treatment

Treatment may be unnecessary for non-lactating stock. However, bulls, heavily pregnant or high producing cows and well-conditioned stock should receive treatment. Animal welfare should always be considered in down affected stock. Veterinary advice or euthanasia should be considered for distressed or prolonged recumbent animals. Dairy Australia has developed information and a decision tree on managing downer cows.

Treatment includes:

- Nursing care- Animals that have gone down should be provided with adequate shelter, water and food, as cattle left exposed in hot weather are much more likely to die. BEF can impair the swallowing reflex, so affected animals should not be drenched or force fed.
- Handled stock benefit from being rolled over several times a day to help avoid loss of circulation to the underside limbs, which will result in permanent muscle damage. The heavier the animal is, the more critical it is to get it back on its feet as quickly as possible. However, for unhandled stock, constant handling such as rolling or attempts to relocate may adversely stress.
- Anti-inflammatory drugs are recommended for recumbent animals and would be useful for clinically affected animals
- Calcium injections- if given early in the course of the illness, can be very effective in helping an animal regain its footing.

NB Always observe with holding periods applying to any drug or treatment

Immunity

Once cattle have been infected with the virus, most will not develop disease if re-exposed to the virus for many years or for life. However, some animals lose immunity after a few years, especially older animals.

Severe disease can occur in animals of any age that are introduced from areas where the disease is uncommon to districts where the disease is frequently observed.

Prevention

Vaccination is available to prevent BEF. To achieve long lasting protection, two doses are required.

The ideal is to give the first dose before disease occurs in the district. The second dose is then given at least four weeks later, and as close as possible to when disease is likely to commence in the district. The second dose can be given up to 6 months after the first dose.

In an outbreak situation where disease has commenced in a district, the second dose can be

given 2 weeks after the first dose. However cattle already exposed to the virus may show signs of disease before protective immunity develops.

Animals can be vaccinated from six months of age and should then be revaccinated each year, at the start of summer, to ensure continued protection.

The decision to vaccinate will depend on:

- the number of animals to be vaccinated,
- the predictability of BEF outbreaks in the region in question, and
- the value of livestock in the herd.

Some producers may decide to protect only their more valuable heavy animals, such as bulls and stud cows. Others may only vaccinate if BEF occurs in cattle to the north, or antibodies for BEF are detected in sentinel cattle close to their properties.

Due to the severe drop in milk production, vaccination is often worthwhile in dairy herds. Local knowledge of the frequency of outbreaks will assist decisions on the age of stock to be vaccinated. However, vaccination of bulls and very high producing cows is strongly recommended.

Vaccination in a commercial beef herd is dependent on the economic value of the herd. It will depend on the stage of the management cycle when risk occurs. For example:

- Fever may cause heavily pregnant cows to abort if they are not protected. Loss of a pregnancy and yearly production can be a substantial economic loss.
- If steers are close to finished weights, the loss of condition if they are infected with BEF may make it economic to vaccinate (if given enough warning). If they are not close to market weight, vaccination may not be worthwhile.

Contact your local veterinarian to obtain advice specific for your circumstances.

Monitoring of arboviruses

NSW Department of Primary Industries and Local Land Services are involved in testing cattle for a National Arbovirus Monitoring Program . Sentinel herds at various locations throughout Australia are blood sampled at regular intervals, to see if the cattle have been exposed to viruses carried by insects. Insect populations are also monitored by collections in special traps.

This allows animal health and quarantine authorities to demonstrate freedom from certain diseases to importing countries, to satisfy export requirements, and possibly give producers warning of the possible spread of disease south from endemic areas.

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