

## TICK BORNE DISEASES AND THEIR CONTROL

### FEATURES

- Heartwater
- Redwater
- Anaplasmosis
- Treatment

The biology and control of tick borne diseases is complex and requires a good knowledge of all aspects of the subject to manage the problem. Especially vaccination and treatment must be done with care. Farmers who are not familiar with the control of these diseases must consult their local veterinarians. The transport and handling of the tick borne disease vaccines must be done with care and strictly according to instructions.

### HEARTWATER

The heartwater organism (*Cowdria ruminantium*) is transmitted by the bont tick which occurs in warm moist regions of the country, namely the bushveld and the eastern coastal areas. The immature tick feeds on small mammals and ground birds, and this makes it impossible to eradicate the tick. Transmission of the disease occurs throughout the year but is less prevalent in the winter. Losses occur in adult animals introduced into heartwater areas or when animals are not exposed frequently enough to tick infestation, usually after drought years. Cattle begin to show symptoms 9-29 days after being bitten by infected ticks (sheep 7-35 days).

Initially animals show fever, listlessness, have a high-stepping gait, difficulty in breathing, and later they show prominent nervous symptoms such as chewing and head pressing. Death follows soon after this. Typical post-mortem signs are the accumulation of fluid around the heart, in the chest cavity, and in the lungs where it is seen as foam. To confirm the diagnosis a brain smear must be made in which the causative organisms can be seen.

Treatment of sick animals is most effective when done early in the disease. Oxytetracycline (ECOMycin LA, ECOMycin Dual Purpose, Econotet 125) should be given preferably intrave-

nously, at a dose rate of 10mg/kg and this should be repeated at least twice. Long acting formulations can also be used.

### Heartwater control in cattle:

- Intensive tick control and minimal disease situation: this is usually practiced in dairies where the farmer cannot accept any risk of diseases which will affect milk production. Intensive tick control is practised and vaccination is therefore not used.
- Strategic tick control and enzootically stable disease situation: Low intensity dipping is necessary because only 10% of the tick population carry the heartwater organism. Resistant breeds such as the indige-

*Photo1. Heartwater organisms in a brainsmear and the bont tick vector (Schering Plough Animal Health)*



*Heartwater vaccination cannot be done in pregnant animals and must not be done at the same time as redwater and anaplasmosis.*

nous cattle only remain resistant if they are constantly exposed to infected ticks. Using this control strategy, sporadic cases of heartwater may still occur especially after drought periods when tick numbers are low and there is insufficient immunisation. Another disadvantage is the tick damage to udders, teats, causing abscesses, tick toxicoses and loss of production.

Calves under 6 weeks are usually immune and they are vaccinated during the period of 1-7 days old. The heartwater vaccine consists of infected blood which must be given intravenously. After immunisation the cattle must be continually exposed to infected ticks. Vaccination of cattle to be introduced into heartwater areas must

be done with extreme care as adult animals will react to the vaccine and will require treatment. During immunisation they must be kept tick free. Heartwater vaccination cannot be done in pregnant animals and must not be done at the

same time as redwater and anaplasmosis vaccination.

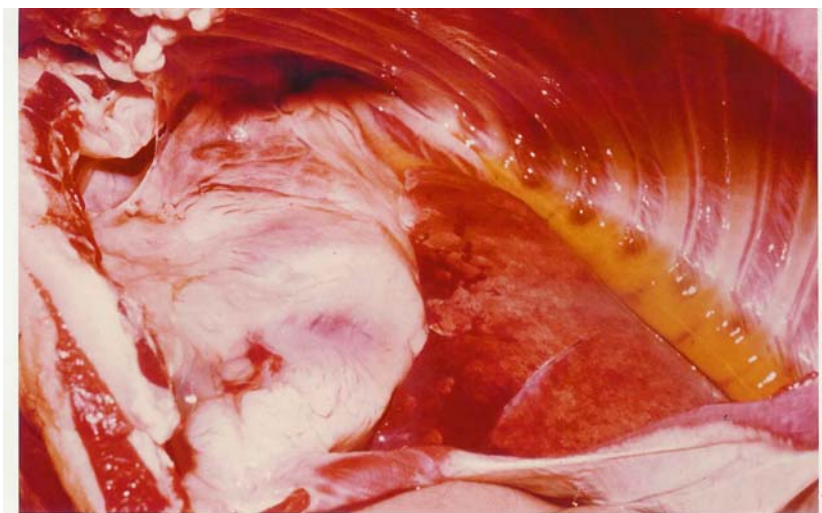
Heartwater management in sheep

Because intensive tick control in sheep is very difficult, strategic control must be done in combination

**Photo 3. A sheep which died from heartwater showing the fluid accumulation in the lungs.**



**Photo 2. The post-mortem of an animal that died of heartwater showing the accumulation of fluid in the chest cavity.**



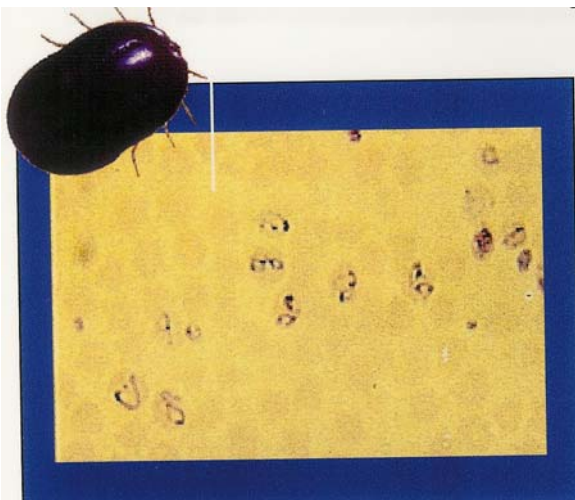
with vaccination which must be done in the first week of life. Angora goats are especially susceptible to heartwater and therefore vaccination must be done with extreme care.

**REDWATER**

Redwater or babesiosis of cattle is transmitted by the two blue tick species (*Boophilus microplus* and *B. decoloratus*). Redwater occurs more widely than heartwater because the ticks carrying the disease have a wider distribution. The disease is absent from the extreme west where the conditions are too dry, and also from most of the Western Cape. Redwater outbreaks are seen in summer and autumn when the ticks are active. There are two types of redwater -African and Asiatic and there is no cross-immunity between the two diseases so it is important to know which types occur on one's farm when vaccination is being contemplated.

Cattle develop redwater 2-3 weeks after exposure to infected blue ticks, and they show high fever, jaundice, anaemia and red discolouration of the urine. Cattle with Asiatic redwater may in addition show nervous symptoms such as muscle tremors and convulsions. If cattle are not treated timeously they will die. Confirmation of the diagnosis can be done when a veterinarian examines a blood smear or in the case of Asiatic redwater, a brain smear.

*Photo 4. The redwater organism in red blood*



*cells and the blue tick vector (Schering Plough Animal Health)*

**The treatment of redwater**

There are two remedies which are effective for the

treatment of redwater: imidocarb (which is also effective against anaplasmosis) and daminazine.

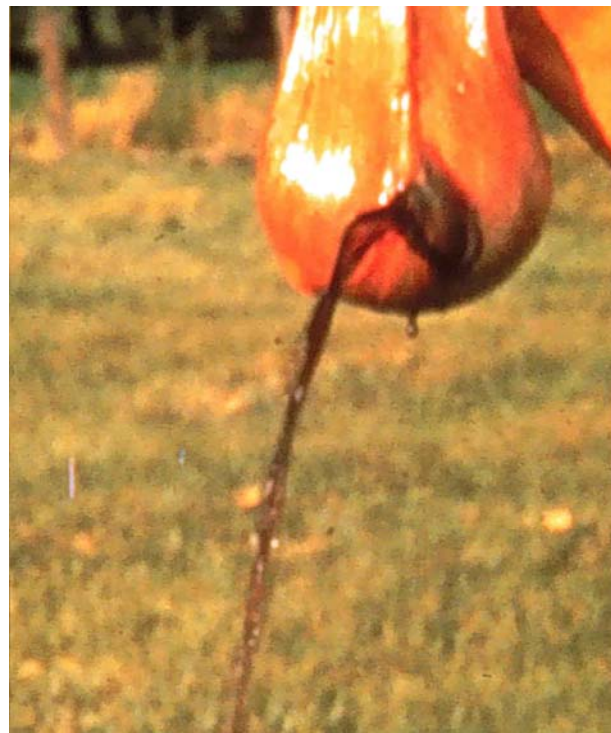
There are 2 types of drugs that can be used to prevent or cure redwater: those products containing **diminazene** and those containing **imidocarb** (Forray 65, Imizol). Much is made by the marketers of these products, of the sterilization of the infection (and therefore the effect on the immunity) by these drugs, but in practice these **drugs all have the disadvantage of sterilizing *B. bigemina* (African) infections**. Since there is no evidence to show that enzootic stability can be achieved with *B. bovis* (Asiatic redwater) in South Africa there would be no advantage in diminazene or imidocarb not sterilizing this infection.

Animals with advanced cases of redwater may need supportive treatment from a veterinarian: fluid or even blood transfusions may be necessary and cortisone administration may be needed to treat the brain involvement in *B. bovis* cases. If diminazene is used as a specific treatment, oxytetracycline (ECOMycin LA, ECOMycin Dual Purpose, Econotet 125) administration may be required to treat concurrent anaplasma infections which often occur. Alternatively one can treat for both infections with imidocarb.

**Managing redwater**

- Intensive tick control with no vaccination is easier to achieve with blue ticks than with bont ticks, but dip resistance can become problematic.
- Strategic tick control can be practiced if a stable disease situation is required, but tick damage and production losses will still

*Photo 5. Redwater parasites cause a breakdown a red blood cells which causes a red discolouration of the urine. (Schering Plough Animal Health)*



occur. In practice it is difficult for a stable situation to be achieved in marginal areas of *B. bigemina* (western border of the distribution). In addition researchers have found that enzootic stability has never been achieved in *B. bovis* areas in SA because of the low prevalence of the organism in ticks. Redwater outbreaks can occur when there is a massive tick challenge for example when cattle are placed in new camps with huge tick populations. Vaccination is safest when done between 3-6 months, when treatment is seldom necessary. Adult animals that require vaccination must be strictly supervised as they may require treatment.

## ANAPLASMOSIS

Anaplasmosis is the most widespread of all the tick borne diseases because it is transmitted by 5 different ticks. Under feedlot and dairy conditions the organism can be transmitted by stable flies. Anaplasmosis outbreaks occur in summer in adult animals; those under 6 months are usually immune. Outbreaks can occur in the winter months if tick numbers are high.

The disease has a long incubation period of 4-6 weeks: affected animals are weak and listless due to a progressive anaemia. They develop constipation because the rumen function becomes impaired. The animals may develop jaundice, show reduced weight and may abort. Death can

result if the animals are not treated.

The diagnosis of anaplasmosis is confirmed by finding of the organisms in a blood smear. Treatment with oxytetracycline (EComycin LA, EComycin Dual Purpose, Econotet 125) or imidocarb (Forray 65, Imizol) is effective. None of the remedies sterilize the infection.

### The management of anaplasmosis

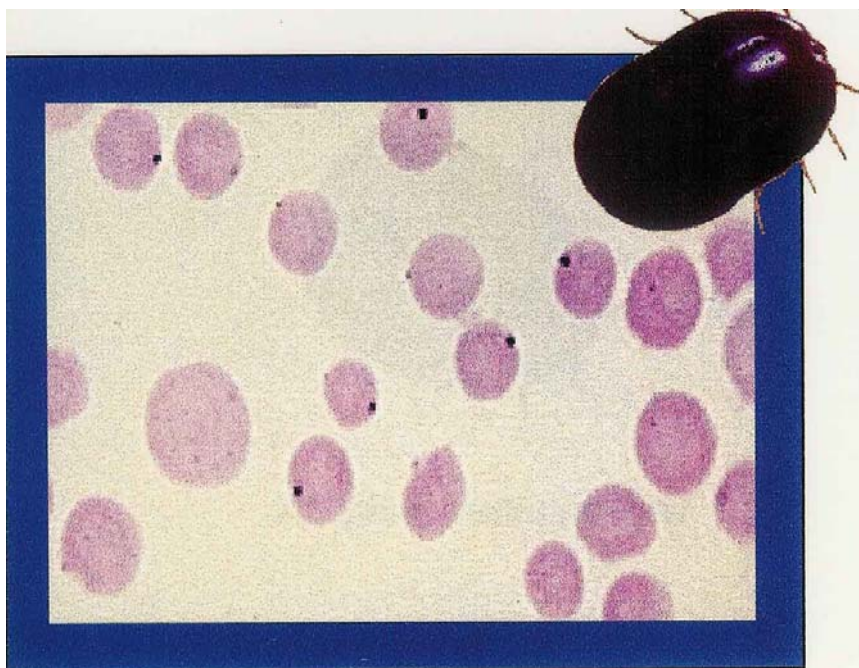
- Intensive tick and fly control: this should be done in dairies where the stress of milk production causes cases. No vaccination is necessary.
- Strategic tick control with vaccination: this is achieved with low intensity dipping and vaccination of young animals to ensure immunity. Sporadic outbreaks can still occur in marginal areas or after dry periods. Vaccination is done between 3-9 months when calves don't react severely. Anaplasmosis vaccination can be done simultaneously with redwater vaccination

## TICK TOXICOSIS

Apart from the component in the saliva of the tick which causes a decrease in appetite and reduction in weight gain, there are some ticks that have specific toxins:

**Sweating sickness:** this is caused by the bont-legged tick (*Hyalomma truncatum*). Affected calves show a wet dermatitis due to the leakage of serum from the skin, which gives the impression of the calf sweating. To reverse the condition, the ticks which are often found on the tip of the tail, must be removed. The animals should be given a dose of antibiotics, as the toxin suppresses the immune system and can give rise to secondary infections such as pneumonia. Sick animals must be fed soft food and kept in the shade during the recovery phase.

*Photo 6. The Anaplasma organism in a red blood cell and one of the 5 tick vectors (Schering Plough Animal Health)*



**Paralysis:** the Karoo paralysis tick (*Ixodes rubicundus*) causes paralysis especially in sheep but sometimes in calves. Spring lamb paralysis occurs when there are large numbers of red legged ticks (*Rhipicephalus evertsi*). The tick paralyses are reversed by the removal of the tick. Prevention of Karoo paralysis is achieved with good tick control after the first frosts.