

Understanding Anaplasmosis (gallsickness)

– Dr. Chriché du Plessis

Gallsickness in cattle is a tick borne disease, predominantly caused by the organism *Anaplasma marginale* and to a lesser degree, *Anaplasma centrale*. *Anaplasma centrale* causes less severe clinical signs than *Anaplasma marginale*. Gallsickness is characterized by fever, progressive anaemia (blood loss) and icterus.

Gallsickness is primarily spread between animals by ticks. It can also be transmitted by insects such as biting flies and mosquitoes. Dirty needles and bloody farm equipment such as ear-notchers, have also been implicated in the transmission of gallsickness between animals.

Distribution of gallsickness

As gallsickness is primarily transmitted by ticks, the distribution of the disease overlaps the distribution of 3 main tick species. *Rhipicephalus decoloratus* (African blue tick), *Rhipicephalus microplus* (Asian blue tick) and *Rhipicephalus evertsi evertsi* (red legged tick) are the most important vectors of the disease. These ticks are found in the coastal regions of the Western and Eastern Cape, throughout KwaZulu-Natal, Mpumalanga, Gauteng, Limpopo, North West and the eastern half of the Free State. It is distributed throughout most of the wetter regions of South Africa and it also occurs in cold mountainous areas such as the Drakensberg range and parts of Lesotho. It is absent from the drier parts of South Africa.

How does *Anaplasma* cause disease?

An infected tick transmits the organism through its saliva when it attaches to the animal. Once in the bloodstream, the *Anaplasma* organisms penetrate the red blood cells and start to multiply. The number of infected red blood cells doubles every 24-48 hours². The incubation period varies but is usually between 3-4 weeks after tick bite transmission took place². Once the red blood cells are infected, they become foreign to the body and are removed by the liver, spleen and lymph nodes. The infected red blood cells are broken down and anaemia starts to develop. Animals can lose up to 70 % of their red

blood cells¹. Anaemia normally becomes noticeable once the animal has lost 40-50 % of the red blood cells. The animal's mucous membranes (gums, eyes and inner layer of the vulva or preputium) are therefore first pale, before it turns into the more common yellow colour. The yellow colour originates from the broken down haemoglobin (red blood cell pigment) in the liver.



Clinical signs

The severity of disease is related to the age of the animal. Animals less than a year of age, rarely show any symptoms. Animals between 1 and 2 years of age show moderate symptoms and in older cattle, the disease is severe and usually fatal¹. Affected animals show fever (although in later stages of disease it will disappear), depression, inappetence, weight loss, pale to yellow mucous membranes, rumen stasis and constipation. Dairy cows have a severe drop in milk production and pregnant animals may abort. Animals that survive have a convalescence period of several months to regain their former condition.

Diagnosis and treatment

A presumptive diagnosis can be made on the clinical signs. However, early stages of gallsickness can easily be confused with redwater. A definitive diagnosis has to be made microscopically on a blood smear. Carrier animals can be diagnosed with serology tests before they are introduced into the herd.

Animals diagnosed with gallsickness can be treated with two recognised active ingredients, Imidocarb (**Imizol**[®]) or tetracycline (**Reverin 135**). Treatment with any of these two drugs does not cause sterilization of the infection. Recovered animals will stay lifelong carriers of the parasites and relapses can occur. It is also these animals that are the cause of new outbreaks in the herd.

Natural immunity to gallsickness

Bos indicus cattle are more resistant to *Anaplasma* than *Bos taurus* breeds but variation of resistance between breeds do occur. Calves younger than 6 months have an innate immunity against *Anaplasma*, irrespective of the mother's immune status. Cattle raised in endemic areas therefore have the opportunity to develop immunity to the disease, before the age when clinical signs become severe.

Control and Prevention

The control of gallsickness depends on 2 strategies, tick control and vaccination. Unlike redwater, blocking against *Anaplasma* is not possible. As most parts of South Africa are endemic to *Anaplasma*, it is advisable to sustain a stable disease situation to prevent large losses. Allowing calves natural exposure to tick borne diseases during the period when they are naturally resistant or protected by passive maternal immunity, will increase the antibody levels against these diseases. If this is not possible, all calves less than 6 months of age should be vaccinated with the *Anaplasma* vaccine to ensure immunity.

References

1. De Vos AJ, De Waal DT & Jackson LA 2004, Bovine Anaplasmosis¹ in *Infectious diseases of Livestock*, eds JAW Coetzer & RC Tunsten, 2nd edn, Oxford University Press, Cape Town, pp. 594-616.
2. Radostits, OM, Gay, CC, Hinchcliff, KW & Constable PD 2007, *Veterinary Medicine. A textbook of the diseases of cattle, sheep, pigs, goats and horse*, 10th edn, Saunders Elsevier, pp. 1455-1459.

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