

Bovine Anaplasmosis

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The recent drought that has plagued the Southeast US has certainly resulted in an increase in the movement of cattle across the region. Along with this movement of animals comes an increase in the possibility of diseases that we may not typically see in certain areas. Veterinarians in some parts of the U.S. are reporting more cases of anaplasmosis in recent years, perhaps as a result of increased cattle movement due to drought and other natural disasters.

Anaplasmosis is a disease characterized by progressive anemia and caused by the rickettsial organism *Anaplasma marginale*. The disease is present in many parts of the Southeastern US, and causes significant economic losses to the beef and dairy industries.

Spread of Anaplasmosis

A. marginale is transmitted from carrier to susceptible cattle via arthropod vectors (predominantly biting flies and ticks) or through contaminated needles, dehorning and castration equipment, tattoo instruments, etc. Ticks serve as biological vectors and are therefore more likely to spread the disease from one herd to another. Horse flies are the other major arthropod vector; however, they are mechanical vectors so transmission requires close proximity of infected and susceptible animals. Stable flies can also transmit the disease, but probably not as effectively as horse flies. Transmission through contaminated needles and equipment is sometimes a more efficient route of transmission within a herd than the arthropod vectors. According to one report, a needle used on an infected animal leads to a 60% chance of the next animal being infected if the same needle is used.

The incubation period (time from infection to clinical disease) can be from 1 to 8 weeks depending on the infective dose. In natural infections it is usually 3 to 5 weeks. The organism replicates in red blood cells which are then removed from circulation, resulting in a progressive anemia. Animals that survive the anemia usually become chronic carriers of the disease. Transplacental transmission is reported to occur and could play a role in the maintenance of the disease within herds. Calves that are infected in utero rarely show clinical signs but become carriers.

The severity of disease is age and possibly breed related. Calves less than one year of age usually only show mild signs or remain asymptomatic. Cattle up to two years of age have acute but rarely fatal disease, and cattle greater than two years of age are most likely to have severe and potentially fatal disease. *Bos taurus* cattle appear to be more likely to develop severe disease than *Bos indicus* cattle. The reasons for the age and breed susceptibility differences are not known.

Clinical Signs

Peracute (rapid), acute, chronic and mild forms of anaplasmosis occur. Acute anaplasmosis is most common and usually occurs in summer and fall during peak vector season. If outbreaks occur at other times, transmission through contaminated equipment should be suspected. Fever,

anorexia, rapid loss of body condition, severe decrease in milk production, pale and icteric (yellow) mucous membranes, increased heart and respiratory rates, muscle weakness and depression are common. Aggression from cerebral hypoxia (low oxygen levels in the brain) is also common, especially in beef cattle. Abortions may occur in females and temporary infertility may occur in males.

With peracute anaplasmosis, death occurs within hours of the onset of clinical signs, whereas chronic disease occurs in severely affected animals that do not die. Recovery may take weeks to months, during which time production losses can be significant (decreased calf weaning weights, infertility, etc.). In mild cases, abortion and decreased milk production may be the only problems, which may go unnoticed.

Diagnosis

Acute cases of anaplasmosis are diagnosed microscopically by finding *A. marginale* bodies at the margin of red blood cells. However, once the acute stage is advanced, it may be difficult to find the organism. Therefore, late clinical disease or the chronic carrier state has to be diagnosed with serologic tests. In the past, the rapid card agglutination and complement fixation tests were most commonly used. A new competitive ELISA (cELISA) appears to have much better sensitivity. However, the sensitivity of the serologic tests depends on the stage of infection, and early in the incubation phase these tests may be negative.

Prevention

Control measures are based upon prevention of blood being shared from an infected animal to a susceptible animal. Such measures include:

- Insect control
- Single use needles
- Dis-infecting equipment between animals
- Screen and purchase replacements from known test negative sources

Conclusion

In a non-infected herd, the goal is to prevent anaplasmosis. Therefore, have your veterinarian screen herd additions with the cELISA. The cELISA is available through your veterinarian at the C.E. KORD Animal Health Diagnostic Laboratory. However, because of the potential for false negatives on the cELISA during the incubation phase, the disease could still sneak into your herd. If you suspect anaplasmosis in your herd, contact your veterinarian for a thorough investigation and advice regarding elimination and future prevention. If you have any questions please feel free to contact: Lew Strickland, lstrick5@utk.edu, or 865-974-3538.