

## University of Missouri Extension

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# Control of Anaplasmosis in Missouri

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Anaplasmosis is an infectious disease of adult cattle caused by the organism **vector**, or the only host that is necessary for the organism to complete its life cycle. Ticks are not biological vectors in Missouri.

Horseflies and eye gnats are probably mechanical vectors, or hosts that transmit the disease-producing organism but are not required for its life cycle. Horseflies are probably the major mechanical vector in Missouri.

Recent studies at Mississippi State show that anaplasmosis can be transmitted from infected calves to non-infected calves with as few as 10 horsefly bites and that horseflies can transmit the disease for at least 60 minutes after a meal of blood.

In addition, blood-contaminated instruments such as needles and dehorning tools can transmit the organism from one animal to another.

The reservoir, or source, of infection for non-infected cattle in Missouri is probably carrier cattle; that is, cattle that have had anaplasmosis but have recovered. In the western United States, wildlife also appear to be reservoirs of infection. But a 1979 MU and Department of Conservation study (Maas, Buening and Porath) of white-tailed deer in Missouri showed that white-tailed deer are not a significant reservoir of anaplasmosis in this state.

Anaplasmosis is a cyclical disease, with outbreaks every five to seven years. The cycles are caused by the gradual buildup of non-infected cattle, which then become infected, causing the visible outbreak and also reducing the number of unexposed cattle that can be infected in the next few years.

Economic losses in anaplasmosis are from decreased milk production, severe weight loss, poor reproductive ability, abortion and sometimes death. The American National Cattlemen's Association in the past has referred to anaplasmosis as the second major disease problem. Annual losses in the United States have been estimated to be \$100 million.

In 1973, a representative statistical sampling of mature slaughter cattle showed that 13 percent of all cattle in Missouri had been infected at some time.

## Symptoms

Clinical disease in closely observed animals is characterized by anemia (blood loss), icterus (yellowing of mucous membranes around the eyes, etc.) and fever. In herds that are not observed so closely, the first sign of the disease may be a dead animal.

The incubation period (from exposure to detection of the organism in a blood sample) may be four to six weeks. Thus, cases may appear in the fall, a month or two after the horsefly season.

Practicing veterinarians must differentiate anaplasmosis from other cattle diseases. Researchers have described four stages of the disease and established methods of differentiating the stages (Table 1). The choice of treatment and prevention measures is based on the stage of the disease (Table 2).

**Table 1**  
Stages of anaplasmosis infection.

Stages of disease	Length	Symptoms	Serology <sup>1</sup>	Identification
Unexposed			Negative.	Serology during non-vector season.
Incubation	3 to 8 weeks — depends on dose.	None.	Negative.	Serology.
Development	4 to 9 days.	Fever, anemia, icterus.	Positive.	Both blood smear <sup>2</sup> and serology.
Convalescent	Few weeks to several months.	Varies with animal.	Positive.	Blood smear and serology.
Carrier	Life of recovered animal (untreated).	None.	Positive.	Serology.

<sup>1</sup>A serological test identifies antibodies in blood serum.

<sup>2</sup>A blood smear will show the anaplasmosis organism in the red blood cells.

**Table 2**  
Treatment and prevention of anaplasmosis.

Stage of disease	Treatment of infe	Control measures for herd
Unexposed	None.	Injection of whole herd with 3 to 5 milligrams per pound of tetracycline; repeat at 28-day intervals; vaccinate; or feed low levels of tetracycline (0.5 milligrams per pound).
Incubation	Injection of tetracycline, 3 to 5 milligrams per pound — may reduce incidence of clinical anemia.	Injection of whole herd with 3 to 5 milligrams per pound of tetracycline; repeat at 28-day intervals; serological testing with vaccination for whole herd and

		treatment of carriers only; or serological testing with treatment of carriers only.
Developmental	Injection of tetracycline, 3 to 5 milligrams per pound	Treatment of infected animals and segregation.
Convalescent	No treatment, evaluate each case; use whole blood	Segregation.
Carrier	Tetracycline for clearing of carrier state only (injection, 5 milligrams per pound daily for 10 days; oral, 5 milligrams per pound daily for 60 days; or 1.1 milligrams per kilogram for 120 days).	Treatment of infected animals or segregation.

The veterinarian may want to collect blood samples from suspect animals because serological tests aid in diagnosis. The test is done at diagnostic laboratories, such as the Veterinary Medical Diagnostic Laboratory at MU and the Missouri State Diagnostic Laboratory in Springfield. While the test is reliable for diagnosing acute cases, reliability of the tests is much less on serum of animals that were vaccinated or received antibiotic treatment in the six months previous to the test.

## Prevention and control

After anaplasmosis has been diagnosed in a herd, various treatment and control options are available to the veterinarian and herd owner. These include:

- Treatment of the visibly sick animals only,
- Antibiotic injections for all herd members at 28-day intervals throughout the horsefly season to prevent disease symptoms,
- Simultaneous vaccination to build immunity and antibiotic treatment of entire herd,
- Serological test to identify carriers with subsequent vaccination of non-carriers and antibiotic treatment of carriers, or
- Serological test with subsequent antibiotic treatment of carriers.

A vaccine is available, but the animals must be vaccinated at least two weeks before the vector season. One dose is given followed by a second dose four weeks later. Thus, to be protected, the animals must receive the first dose six weeks before the horsefly season. Duration of immunity may exceed one year, and the manufacturer recommends biennial revaccination.

Use the vaccine with caution in pregnant cows because an incidence of N.I. (neonatal isoerythrolysis) has been noted in some herds. Current recommendations are to vaccinate only open animals. Definitely do not vaccinate cows in late gestation.

Vaccination will reduce clinical disease or the visible signs of the disease, but animals can still become infected and become carriers.

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## Related MU Extension publications

- G7013, Protecting Cattle from Horse Flies  
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