

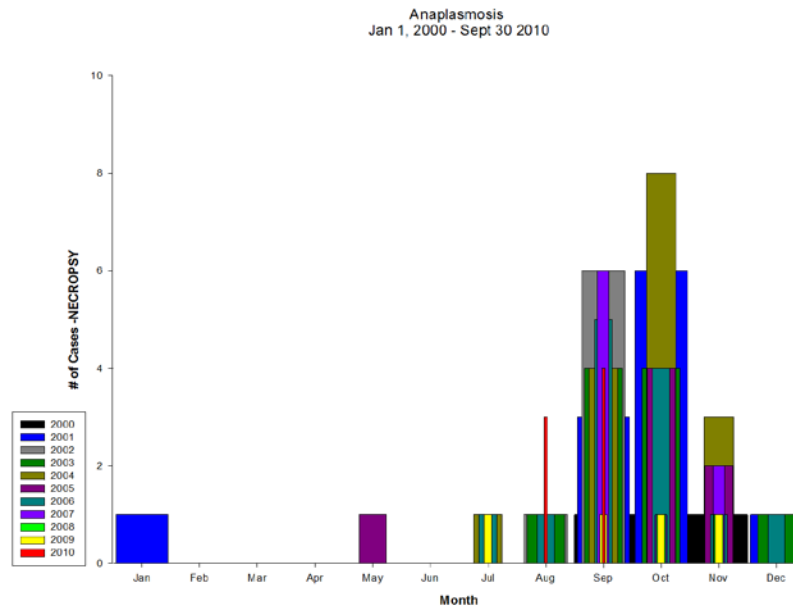
# Did Anaplasmosis Kill My Cow?

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By: Dr. Michelle Arnold, DVM

Anaplasmosis is an unusual disease that is diagnosed with increasing frequency in the late summer and early autumn in Kentucky. The “rickettsia-like” organism, *Anaplasma marginale*, lives in red blood cells of cattle but it ultimately depends on ticks for its survival. Ticks (*Dermacentor* spp.) are “biological vectors” that can transmit the organism through their saliva to uninfected cattle. They are of great importance because *A. marginale* can survive and multiply within the tick for up to a year. The disease consistently occurs in the southern, southeastern and northwestern regions of the United States where ticks survive year round but, because of interstate movement of cattle, the disease has now been reported in all 48 contiguous states.

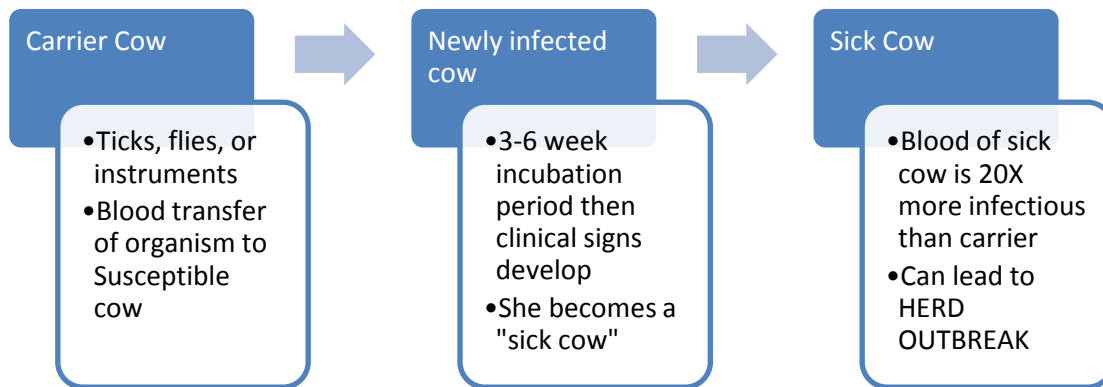


Anaplasmosis Cases Diagnosed at the UKVDL  
Graph by Dr. Jackie Smith, UKVDL Epidemiology Department

*Anaplasma* organisms can also be spread mechanically by any transfer of blood such as biting insects and by veterinary instruments. Biting insects (mosquitoes, horse flies, stable flies, midges) generally cause a few sporadic cases while spread via blood contaminated instruments (such as needles, dehorners, ear taggers, castration tools, and implant guns) will result in multiple cows showing signs 3-6 weeks after working the herd. Recently, transmission from cow to calf during pregnancy in the 2<sup>nd</sup> and 3<sup>rd</sup> trimesters has been recognized that can lead to abortion or birth of a persistently infected calf. Calves considered “persistently infected” will

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never develop clinical signs of disease yet serve as potential sources of infection for the herd.



There are generally four phases of disease:

- 1) Incubation- The organism slowly reproduces in the bloodstream 3-6 weeks (or longer) during which time the animal remains healthy. When approximately 1% of the total red blood cells (RBCs) are infected, there is rapid disease progression.
- 2) Developmental Stage- This is the stage when characteristic clinical signs appear lasting 4-9 days. Signs are age-related; cattle less than 6 months old usually show no symptoms, those 6 months-3 years old are increasingly ill, and mature animals 3 years old and older have a 30-50% death rate if untreated. Signs include:
  - a. Fever- Very first sign. (104-107 °F)
  - b. Pale around eyes, muzzle, teats due to anemia
  - c. Watery thin blood (causes increased heart and respiratory rate)
  - d. Yellow mucous membranes by day 2-3
  - e. Lethargy/Weakness/Lags behind herd (May fall and be unable to stand)
  - f. Off feed/No cud chewing/Weight Loss
  - g. Constipation/Dehydration
  - h. Dramatic drop in milk production
  - i. Reproductive disorders: abortion in cow/infertility in bull
  - j. Staggering/Collapse/"Sudden death" in a highly susceptible or immune compromised animal such as a high producing dairy cow
  - k. Aggressive behavior due to lack of oxygen to the brain
- 3) Convalescent Stage- Recovery occurs over a 2-3 month span and cows frequently lose weight and/or abort calves during this time.
- 4) Carrier Stage- Animals that recover remain carriers for the rest of their lives. No clinical signs are associated with this lifelong persistent infection.

Diagnosis of clinical cases is based on history (including geographic region and time of year), clinical signs, blood test results and abnormalities found at necropsy. The blood test (serum cELISA) is very reliable but cannot detect very early cases during the initial 3-6 week incubation period. It is important to remember an animal may die from another totally unrelated disease (for example-pneumonia) and also test positive for anaplasmosis if the animal is a carrier of the disease. Therefore a positive blood test result for anaplasmosis does not always mean it is the actual cause of disease or death.

Treatment of clinical cases with injectable tetracycline is essential if the cow is showing clinical signs. Oxytetracycline is formally approved for treatment but only under the direction of

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a licensed veterinarian. Animals showing clinical signs of disease require a long-acting injectable tetracycline such as LA-200®, Tetradure™ or Noromycin™ 300 LA. Exercise caution when forcing an infected animal to move as aggressive behavior and/or quick death may result from lack of oxygen. Appropriate milk and meat withholding must be observed. No treatment can effectively clear the organism from all infected carriers. If the organism is cleared, the animal becomes completely naïve and may be re-infected if exposed to the organism at a later time. Work with your veterinarian for guidance in diagnosis, treatment, and control measures.

Control and management strategies are based on the geographic area in question and the producer's goals. In areas where the disease is common such as the South, the goal of control programs is to keep animals healthy when they are exposed to the organism until adequate immunity is achieved. A conditionally licensed killed vaccine is available to veterinarians in several states (including Kentucky) to help prevent the clinical disease from occurring. The manufacturer recommends administering the vaccine to all bred heifers and young bulls who will be at least 14 months old by October. Initially two doses are required given 4 weeks apart with an annual booster. The vaccine may also be given in the face of an outbreak but the two doses are given 3 weeks apart in this instance. Vaccination will not prevent an animal from becoming infected; instead, it helps prime the immune system to respond more quickly to the organism and prevent the severe anemia and possible death of the animal.

The UK Veterinary Diagnostic Laboratory and Breathitt Veterinary Center recommend the cELISA test on serum to detect infection and active carriers. Your veterinarian can collect blood in a red top tube and remove the serum by spinning the collection tube down and transferring the serum (straw-colored fluid) to a labeled transfer tube. Specimens should be transported to the lab as soon as possible after collection (overnight ship with cold packs). It is also recommended that a blood sample (purple top tube) be submitted for a complete blood count (CBC) with differential in order to identify *A. marginale* in the red cells and to assess the degree of anemia. Necropsy of suspicious cases is encouraged to definitively identify the cause of death. Please visit the laboratory web sites for additional information: BVC at <https://breathitt.murraystate.edu> and UKVDL at <http://vdl.uky.edu>