

# Bovine Anaplasmosis

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Anaplasmosis, caused by the Rickettsia *Anaplasma marginale*, is a vector-borne disease of ruminants affecting beef cattle on range. It is a complex disease with different modes of transmission and a life cycle that involves both ruminants and multiple species of ticks. It can be found in most tropical and subtropical regions on earth with few exceptions, such as Hawaii.

Ranchers in California have been managing this disease historically by controlled exposure of cattle to the pathogen. Interestingly, young cattle less than a year old don't show signs of disease when they get infected. It is thought that this age group is better at replenishing the red blood cells that *A. marginale* parasitizes and that get eliminated from the bloodstream by the spleen.

Once infected, an animal typically becomes a carrier for life, but will also become immune to further bouts of disease. Ranchers try and take advantage of the biology and physiology involved in *A. marginale* by deliberately exposing young animals to ticks transmitting the disease and inducing immunity in this manner.

A further mode of transmission is by mechanical transfer of small amounts of blood from one animal to another. This can happen via a biting insect such as a stable or horse fly or by a hypodermic needle used on multiple animals during vaccination of a group of cattle. Ear taggers or tattooers can also transmit *A. marginale* between animals. Nevertheless, there are many unknowns when applying the method of controlled exposure:

- The tick burden in any given year depends on weather patterns
- The types of strains circulating in a given area can have an influence on how severe the disease is they are able to cause
- The density of wildlife reservoirs such as deer or other wild ruminants affects transmission of *A. marginale* to ticks and cattle.

The topic was recently discussed during the Cattle health meeting at the California Cattlemen's Association in Reno, Nevada by Dr. Gabriele Maier, CE specialist for beef cattle herd health and production, with a special focus on vaccines.

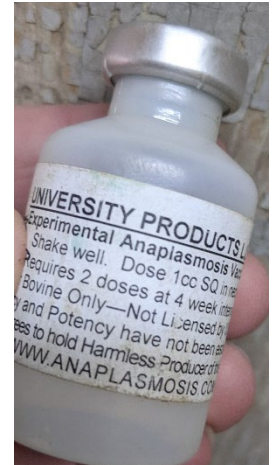
Historically, several vaccines were available to protect cattle from anaplasmosis. In California, a modified live vaccine, Anavac® was on the market, which could only be administered to cattle less than 12 months of age, in order to avoid clinical disease. This

vaccine was licensed by the secretary of food and agriculture in California, but subsequent state legislation required all biologics to be licensed through the United States Department of Food and Agriculture and no such license was pursued for Anavac®.

A killed vaccine named Anaplaz® was discontinued by the manufacturer due to company restructuring. The only vaccine available today in the United States is a killed vaccine marketed by University Products LLC headed by Dr. Gene Luther, a professor emeritus at Louisiana State University. The efficacy of the available vaccine has, however, not been documented through controlled studies.

Efforts are under way to develop a new vaccine by several researchers at Kansas State University. Developing new vaccines is challenging due to the fact that we suspect to have a multitude of strains in many locations of the US as a result of intensive cattle transportation across state lines. A new vaccine will have to provide cross-protection to all circulating strains.

In addition, *A. marginale* has ways to evade the immune system of its host, that add to the difficulties in designing an effective vaccine. Many challenges lie ahead on the way to managing this disease in cattle on range and it will require the work of many dedicated researchers, veterinarians, and producers to provide the desired tools for the cattle industry.



To order the killed vaccine contact California Cattlemen's Association at 916-444-0845

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