

PREVENTING ANAPLASMOSIS

This winter has been mild, moist, and long. This should make it a banner year for ticks and could increase the risk for diseases such as anaplasmosis. This month's column will discuss prevention of this important cattle disease.

What is Anaplasmosis? This is a disease of cattle caused by an organism called *Anaplasma marginale*. This organism is a rickettsia—halfway between the viruses and the bacteria. It cannot grow without living cells (like a virus) but is susceptible to tetracyclines (like the bacteria). The disease, anaplasmosis, is caused when the infected cattle react to the agent and remove their own infected red blood cells. This reaction causes a severe anemia and often death.

Which cattle are susceptible to infection with *A. marginale*? All cattle are susceptible to infection by *A. marginale*. Also, deer, elk, and other wild ruminants are susceptible to becoming infected and can act as natural reservoirs of the agent. Cattle of any age can become infected; however, **young cattle do not become ill**, as will be explained later.

How do cattle become infected with the anaplasmosis agent? A number of ruminants such as cattle, deer, and elk can be carriers of the anaplasmosis agent. These species can carry the agent all or most of their lives and serve as a reservoir for infection of other animals. The transfer of the agent from a carrier animal to a susceptible animal can occur by a number of routes. One of the most common ways is via ticks. In California, we have a number of ticks that transmit the anaplasmosis agent and are extremely effective at passing the agent to new, susceptible hosts. Additionally, transmission of a small amount of blood from a carrier animal to a susceptible animal can transmit anaplasmosis. So insects such as horse flies, are capable of transmission. An even larger culprit in this type of transmission is man. Ear-tagging instruments, tattoo tools, needles, ear implant tools, castrating instruments, dehorning instruments, etc., can all easily transmit the agent. So we can also be important in the spread of this disease.

What happens when a susceptible animal becomes infected? If the animal is a calf under the age of 12 months, virtually nothing is noticed. The calf undergoes an incubation period of about 45 to 90 days, has a very mild illness, which is rarely noticed, and becomes a carrier for life. Cattle that become infected between 1 and 2 years of age become ill after the incubation period, with severity increasing with age. Cattle over 2 years of age become very ill and approximately 50% die unless treated. **The older the animal and the better shape they are in--the sicker they get!** Usually, once the cattle become infected, and if they survive, stay infected for life. They are "immune carriers"—they do not get sick; but, act a reservoir for other susceptible animals. Therefore, being

an infected carrier protects the animal from becoming sick if re-infected by ticks or other means.

What determines if a herd will have problems with anaplasmosis? The location of the herd is important in determining whether or not problems will occur. The cattle and deer that might be reservoirs and the ticks that naturally transmit the disease are the primary factors. For example, herds raised in the central valley of California on permanent pasture, with no ticks, no deer, and no carrier cattle, there is essentially no risk of anaplasmosis. These cattle are free of the disease, have no immunity (unless vaccinated), and are totally susceptible to infection and disease. If these cattle are introduced to oak foothill pastures, especially during a bad tick year, they will become infected, get sick, and 50% will die if not treated. When cattle are raised in the coastal foothills, Sierra foothills, and many mountain areas of California, they become infected early in life, have no clinical disease when infected (because they are young), and are “immune carriers”. If new, susceptible cattle come into these areas, they are at risk. If these carrier cattle go to the valley pastures, they may act as sources of infection—especially via blood transfer (dehorning instruments, ear taggers, horse fly transmission, etc.). Many cattle herds are between these two extremes and it is common for a percentage of the adult animals to become infected and sick every year. These are herds that need to vaccinate routinely to prevent losses. It is common for bulls that come from anaplasmosis-free areas to be very susceptible when introduced to herds where anaplasmosis is common. Remember, when bulls become infected and are successfully treated (do not die) they are often sterile for many months.

What can I do to prevent anaplasmosis in my herd? This depends on the risk of anaplasmosis in your operation. For those “valley” herds, the only real risk is introduction of carrier cattle and transfer of blood (horse flies, dehorning instruments, castration instruments, etc.) from the new cattle to your native, susceptible animals. For foothill or mountain herds, you have to be sure incoming cattle (cows, heifers or bulls) are from anaplasmosis areas or have been vaccinated. For herds intermediate in risk, you will want to review your vaccination program with your veterinarian.

What vaccines are available? In California we currently have two vaccine options. The first is a live vaccine available from Poultry Health Laboratories and is called **Anavac®**. **It is safe and effective when given to young cattle (4 to 11 months of age)**. The cattle become infected with the vaccine strain of *Anaplasma* and are “immune carriers”. This method of preventing disease is basically a controlled infection. If this vaccine (Anavac®) is given to older cattle, they will become sick and could die, just as with the natural disease. Vaccination of mature bulls with Anavac® can cause death loss or infertility. A killed vaccine is also available in California and can be purchased from the California Woolgrowers Association (next door to CCA in Sacramento). When cattle are vaccinated with this killed product (2 doses are needed initially) they develop enough immunity to prevent illness when they become infected. ***This vaccine does not prevent against infection by the anaplasma organism.*** When the vaccinated cattle are infected by the *Anaplasma marginale* organism under field conditions, they go through a normal

incubation period of about 45-90 days, have a slight drop in their red blood cell count, and remain normal in appearance. These vaccinated cattle do not become ill; but, they do carry the field strain *Anaplasma* organism after they become infected. Most infected cattle then carry the organism for their entire life. They are "immune carriers". That is to say, they are "immune" to becoming sick from the agent; but, are carriers of the agent. If you were to take a small amount of blood from one of these "immune carriers" and put it into a susceptible cow, that cow would become infected and sick. These two vaccines are very important. If you purchase bulls or heifers for replacements this fall, be sure these cattle are protected. If the cattle were vaccinated with the live vaccine (Anavac®) as calves and not fed tetracyclines in the feedlot, they will be immune carriers and safe from getting sick. If they were fed tetracyclines (a common procedure for bulls being grown in a feedlot), they will lose their immunity after 1-2 years if they do not become re-infected and therefore could become susceptible again. If the cattle are over a year of age, be sure they were vaccinated with two doses of the killed investigational vaccine. They should be protected against becoming ill when naturally infected on your ranch.

Where can I get these vaccines? The live vaccine, Anavac® is available through Poultry Health Laboratories, in Davis, California. It must be shipped on dry ice or in liquid nitrogen. Their number is (530) 753-5881. The killed vaccine is available through California Woolgrowers Association, at (916) 444-8122. This vaccine can be shipped via normal refrigeration.

As you can see from this brief discussion, anaplasmosis is a very complicated disease and the need to vaccinate will vary from herd to herd. Particularly important is the protection of susceptible cattle coming into an "anaplasmosis area". Make sure that when you buy bulls or replacement heifers they are protected. Either they are raised in anaplasmosis areas or they have been vaccinated and are protected. This is doubly important for bulls, because if they get sick and don't die, they can be sterile. Talk this problem over with your veterinarian in detail. You won't make any small mistakes when dealing with anaplasmosis in California!

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