

ANAPLA

Anaplasmosis may be an old disease, but it is presenting new problems for Western ranchers. Core to the problem, there is no longer a vaccine that can be used on cattle older than 1 year of age.

BY ANDRA CAMPBELL



Cattle can become infected with anaplasmosis at any age, but the severity of the illness will increase with the age of the animal, says veterinarian John Maas of the University of California, Davis, School of Veterinary Medicine.

For commercial cow-calf operator Rob Frost, managing around anaplasmosis is a way of life. “When we bring in outside cattle, we are scared to death of anaplasmosis,” says Frost, who manages his cows near Santa Paula, Calif. “Most of our native cattle get through the disease, but we have to bring in bulls and have a 50% chance of having problems.”

“We used to be able to vaccinate the bulls when they came on the ranch with the killed version of the vaccine,” says Frost. “Now we don’t have anything to vaccinate with if they are older than 12 months. We would be taking a tremendous risk to use bulls [that] were not already vaccinated.”

So, before looking at pedigrees, expected progeny differences (EPDs) and structure, his first question is, “Has this bull been anaplasmosis vaccinated?” If a bull is older than 12 months of age and not vaccinated, he is not an option.

“I know it’s a matter of economics,” says Frost, “but I would pay twice the amount to have a [killed] vaccine available. It’s important to us, and it’s important to the seedstock producers who are marketing bulls.”

What is anaplasmosis?

Anaplasmosis is caused by an organism called *Anaplasma marginale*, a rickettsial agent that invades red blood cells. Once it gains entry into a susceptible animal, the organism slowly reproduces in the animal’s blood. During a short incubation period, the

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animal will show no outward signs of problems. The disease is caused when infected cattle react to the agent. Their natural defense systems kill the infected red blood cells, causing severe anemia.

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"The calf goes through an incubation period of 45 to 90 days, has a very mild illness, which is rarely noticed, and becomes a carrier for life," Maas says. Cattle that become infected between 1 and 2 years of age become ill after the incubation period, with severity of the illness increasing with age.

"Cattle over 2 years of age become very ill, and approximately 50% will die unless treated. The older the animals and the better shape they are in, the sicker they get," he adds.

The transfer of agent from a carrier animal to a susceptible animal can occur by a number of routes, Maas says. "One of the most common ways is via ticks. In California we have a number of ticks that transmit the anaplasma agent. All of these ticks pass the agent from one life stage to the next. Some of our common ticks pass the agent to the next generation of ticks via the egg. These ticks are effective at passing the agent to new, susceptible hosts. Additionally, any transmission of a small amount of blood from a carrier animal to a susceptible animal can transmit anaplasmosis."

Humans and insects, such as

horseflies, are other ways anaplasmosis is spread. Ear-tagging instruments, tattoo tools, needles, ear-implant tools, castrating instruments and dehorning instruments can spread the infectious agent.

Change in vaccine status

Two killed vaccines — Anaplaz[®] by Fort Dodge and Plazvax[®] by Schering-Plough — were available until 1998. Both vaccines protected against anaplasmosis by containing the killed *A. marginale* organism, which had been harvested from infected cattle. "The organism was killed and processed to make an effective vaccine," Maas says.

When the cattle were vaccinated, their immune systems would respond to the vaccine antigen, and they would develop enough immunity to prevent illness when they became infected. The vaccines did not prevent against infection by the anaplasma organism but would allow the vaccinated cattle to go through a normal incubation period of 45-90 days, have a slight drop in their red-blood-cell counts and remain normal in appearance.

"The vaccinated cattle do not become ill," Maas says, "but do carry the anaplasma organism after they become infected." They will carry the organism for life. If you were to take a small amount of blood from one of these vaccinated, yet infected, carriers and put it into a susceptible cow, that cow would become infected.

"These vaccines were important for disease control on many ranches," Maas says. "Without these killed versions, many ranchers have had to let

nature take its course. This can get costly."

There is an alternative for California cattlemen — Anavac[®] by Poultry Health Laboratories Associates (PHL). This vaccine is a modified-live version that is safe and effective when given to cattle that are less than 1 year of age. These cattle become infected with the vaccine strain of anaplasma and are immune carriers.

"This method of preventing disease is basically a controlled infection," Maas says. If this vaccine were given to adult cattle, they would become sick and could die, just as with the natural disease. "Vaccination of mature bulls with Anavac can cause tremendous losses, as the bulls can die and will definitely become sterile."

Many seedstock producers were unaware that a killed version of the vaccine was no longer available in 1999. Bulls that were older than 1 year of age could not be safely vaccinated with the modified-live version. This made bulls vaccinated before they were 1 year old (or lucky enough to have owners who had some of the killed vaccine left) a hot commodity in the West.

For 2000, producers are more aware that bulls have to be vaccinated before they are 12 months old if they want a chance to be marketed to an area where anaplasmosis is a threat.

Herd location important

The location of the herd is the main factor in determining the anaplasmosis threat, Maas says.

"The cattle and deer in each local area that might be reservoirs and the ticks that

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—John Maas

naturally transmit the disease are the primary factors," he says. "For example, [for] 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." Theoretically, 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 foothill pastures, especially during a bad tick year, they will become infected, get sick, and 50% will die if not treated," Maas says.

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When cattle are raised in the coastal foothills, Sierra foothills and many mountain areas of California, they often become infected early in life, have no clinical disease when infected (because they are young) and become immune carriers.

"If new, susceptible cattle come into these areas, they are definitely at risk," Maas says. And if these carrier cattle go to the valley pastures, they may act as sources of infection — especially via blood transfer (via dehorning instruments, ear taggers, insects).

"Many cattle herds are between these two extremes, and it is common for a percentage of the adult cattle to become infected and ill every year," Maas says. "These are the herds that need to vaccinate routinely to prevent losses."

Living with the problem

For coastal cow-calf operator Dennis Hayes, anaplasmosis is something of which he has been aware his entire life. "I remember as a kid vaccinating all outside cattle," says Hayes, who hopes to have this opportunity again in the near future. "And not all native cattle are immune to the disease either. We had one die this year."

They pasture their cows in brushy country that has a lot of ticks, and if a cow gets sick and they don't find her in time, it's a death loss, Hayes says. "We don't check our cattle every day. If one becomes anemic, gets weak, we are not there to treat them."

Hayes says you always can tell a cow or bull that has anaplasmosis by the look in its eyes. It will be anemic, pale, weak, and have an increased respiratory rate and rapid heart rate. If the lack of oxygen to the brain is severe, the animal will become belligerent and may attack people, horses and pickup trucks.

"If we find an animal before it's bad, we can rope and doctor



BRAD PARKER PHOTO

If you already have anaplasmosis in your herd, the cattle are considered "immune carriers" and have virtually no risk of dying. If your herd is free of the disease and you need to market cattle into herds that have the disease, you must vaccinate them prior to 1 year of age.

it on the spot with [tetracycline]," Hayes says. Sometimes pushing them to a chute is enough exertion to send them over the edge, either in terms of dehydration or belligerence.

"Their body basically shuts down," Maas says. "When an animal drops from 33% red blood cells to 28%, they may get tired. When the count drops to 10% or less, there's not enough to carry oxygen to the brain."

If possible, treat the cattle with tetracycline. If not, make available food and water, and hope for the best.

One problem found with tetracycline is that, if it's fed as an additive for seminal vesiculitis or given as a shot for pinkeye or foot rot, there's a probability that the animal, if not re-exposed to anaplasmosis in a two-year period, will be free of the disease with no immunity — whether it was vaccinated or

not, and even if it was an "immune carrier."

If you're concerned about anaplasmosis in your herd, the best thing to do is ask your local veterinarian about the disease and whether you are in an anaplasmosis-free area.

"Anaplasmosis is a very complicated disease, and the need to vaccinate will vary from herd to herd," Maas says. "Particularly important is the protection of susceptible cattle coming into an anaplasmosis area. Make sure that when you buy cattle they are protected — either they were 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 still be sterile for up to a year."

The California Cattlemen's Association (CCA) and several other state associations are

working in cooperation to get a killed or safe version of the modified-live vaccine on the market. "This is a hot topic of conversation," says John Braly, executive vice president of CCA.

"We are discussing anaplasmosis at our tour meetings and are aware of the significance of the problem. States such as Florida, Texas, Missouri [and] Alabama have asked to come on board and put up the front money with California to help spread out the costs associated with the vaccine," Braly says. "It's simply a supply-and-demand issue; we need a big market, over a long period of time in a widespread area, in order to spread out the cost. It is everybody's hope that something will be available by the end of the summer."

