

SUDDEN DEATH IN ADULT CATTLE

In the past week I have talked to two top producers in California who had experienced the same problem, they expressed it something like this, "The cow was normal, eating, in good flesh yesterday and I found her dead this morning." This is an important and unfortunately, common problem in beef cattle operations in California. Of course, what we really want to know is, "What caused this and what can we do to prevent it from happening again?" The challenge for your veterinarian and you is to first figure out the cause(s) and then make changes to prevent losses in the future. In this month's column I am going to review some of the common causes for sudden death in beef cattle and briefly discuss what tools are available for prevention.

One of the most common causes of sudden death in cattle is **Redwater** (also called Bacillary Hemoglobinuria). Redwater is caused by a bacterium called *Clostridium hemolyticum*, which colonizes in the liver of susceptible cattle and produces protein toxins that in turn destroy the body's red blood cells, damages other organ systems and rapidly causes death. Redwater is uncommon in cattle less than one year of age and while young cattle possess a certain resistance to *Cl hemolyticum*, they can be affected and die also. The most commonly affected cattle are adults in good condition.

The disease has a short incubation period and the vast majority of affected cattle are usually found dead and bloated. If clinical signs are observed, the most common ones are anemia, rapid breathing, high fever (104-106), and urine that is dark red and foamy in appearance. The course of the disease is very rapid and most all cattle with Redwater are simply found dead and most bloat soon after death. Animals that die in this manner should be examined by your veterinarian or sent to the diagnostic laboratory to determine the cause of death so that other losses can be prevented. Your veterinarian can easily identify Redwater as the cause of death by examining the liver and your veterinarian can also take a simple impression smear of the liver to confirm the condition.

Prevention of liver fluke infestation will aid in the prevention of Redwater. However, the most important means of prevention is the routine use of vaccines (bacterins) to increase the immunity of the cattle against this disease. Animals should be vaccinated and given a booster at least once per year in areas where the disease occurs. An excellent time for the booster is in the late spring or early summer, ahead of the seasons when this disease is most common. The vaccines used to prevent Redwater do not provide long term protection, however, and exposure to a large number of organisms seems to override the protection provided by a yearly booster. In areas of high exposure cattle may have to be vaccinated every 6 months or in some instances, every 2 to 3 months. Your veterinarian can give you excellent advice about the vaccine frequency that works best in your locale.

Another disease that can easily cause sudden death in adult cattle is *Anaplasmosis*. This is a disease of cattle caused by *Anaplasma marginale* which 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 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. All cattle are susceptible to infection by *A. marginale*. Cattle of any age can become infected; however, young cattle do not become ill. Some cattle are simply found dead, while others may be found weak, anemic, and jaundiced (yellow mucous membranes).

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.

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.

The best method for prevention 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, tattoo 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. Vaccines are available to help prevent this disease. 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 Cattlemen's Association. When cattle are vaccinated with this killed product (2 doses are needed initially) they develop enough immunity to prevent illness when they become infected.

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 Cattlemen's Association, at (916) 444-0845. This vaccine can be shipped via normal refrigeration.

Another cause of sudden death is *Anthrax*. The disease, anthrax, is caused by a bacterial species called *Bacillus anthracis*. The organism is a common inhabitant in alkaline soils. The anthrax bacteria compete very well in conditions that alternate between floods and droughts. The organism can multiply in wet conditions and when dry conditions come along, it forms spores, which are very resistant to environmental conditions. The spores can survive for more than 35 years in the environment, waiting for the next favorable opportunity to multiply once again. Cattle contract the disease when they ingest (eat) the spores. The grazing of abrasive forages is thought to allow penetration of the spores through the lining of the mouth. When the anthrax organism enters the blood stream and multiplies a fatal infection can occur rapidly.

When cattle become infected with the anthrax organism the disease usually proceeds rapidly. Most often, the cattle appear to be normal one day and are found dead the next. Anthrax usually occurs on the same premise on an irregular basis. Therefore, there is often a history of anthrax occurring on a ranch or at least in the general area. Often, certain fields are known to be "hot" areas for possible occurrence of anthrax. So, sudden death in animals in these areas should raise suspicion. Also, cattle with bloody diarrhea, bloody urine, and blood coming from the nose should make you very suspicious of anthrax. If an animal dies suddenly with signs such as those above, call your veterinarian and do not disturb the carcass or move the animal. Your veterinarian will take a minimal number of samples if anthrax is suspected. Usually a blood sample from the jugular vein, part of an ear, or an eye will be carefully taken and submitted to the diagnostic laboratory. It is important to not open the carcass. The anthrax organism will die out in an unopened cattle carcass in a few days. However, if the carcass is opened to the air, many billions of spores will form and these spores can survive in the environment for decades. The California Animal Health and Food Safety Laboratory will usually confirm an anthrax diagnosis within a day or two of receiving the samples or the carcass.

The live cattle at risk will be moved away from the suspected area of spore contamination. They will be fed hay or put onto irrigated pasture. The cattle will be treated with penicillin as recommended by your veterinarian and the California Department of Food and Agriculture's Animal Health Branch. The cattle will also be vaccinated with the anthrax vaccine. The CDFA and your county health officials will advise regarding the proper disposal of the dead animals. Usually, the dead cattle are buried and covered with quicklime.

Most ranches in California will never have to worry about anthrax or preventing anthrax. However, on premises that have a history of anthrax preventive methods must be considered. In cases where specific areas are identified as "high risk" those areas need to be avoided, particularly in the summer and fall months. Also, there is an effective vaccine for cattle and it should be given before the cattle are placed into these areas. Therefore, with vaccination of the cattle and avoiding "high risk" areas anthrax can be prevented in almost all instances.

There are two other diseases that can cause sudden death and are associated with cattle grazing on pastures. One condition is grass tetany and is seen in the winter and spring when cattle are grazing lush foothills pastures. Another condition is called "fog fever" and occurs when cattle return to hay meadows in the fall. Both conditions can cause sudden death; however, both usually affect large numbers of cattle at the same time and are usually diagnosed in rapid fashion. In both cases, if the first few deaths go undiagnosed or are ignored the delay in response can be economically devastating. Grass tetany is prevented by supplementing magnesium to cattle and fog fever is prevented by slowly acclimating cattle to hay meadows and feeding Monensin® in a supplement.

There are a host of poisonous plants that can kill cattle quickly and often with no signs beforehand. These plants include Oleander, Japanese yew, hemlock, Sudan grass, pigweed, and lamb's quarter. Oleander and yew toxicities commonly occur when these ornamental plants are pruned and the dead plants are thrown over the fence into a pasture "for the cows". These two plants are highly toxic and death occurs rapidly—as few as 4-6 leaves of Oleander can kill a cow. Hemlock grows around wet areas such as ditch banks and canals and can result in rapid death in adult cattle. Sudan grass hay, pigweed, and lamb's quarter can accumulate nitrates which cause the blood of cattle to turn a dark brown (chocolate) and result in rapid death. Sudan grass and certain sorghum crops can also cause cyanide toxicity if plant conditions cause cyanide to accumulate in the plants before the cattle consume them.

So what's the bottom line? Cattle in good shape and apparently normal that die in a short period of time shouldn't be ignored. ***There is a reason they died.*** Depending on the cause of death, there may more to follow or it may be months before it happens again. If the carcass is fresh have your veterinarian start working on getting some answers, so you can take steps to prevent the problem in the future.

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