VALLEY VETERINARIANS, INC.
COW DOCS

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Disease Profile:

Salmonella in Cattle

Seventy five percent of California dairies had evidence of Salmonella infection, according to a recent study. And there is evidence that the prevalence of this highly contagious disease is increasing.

Not only does Salmonella sicken and kill calves and cows, leading to expensive treatment costs and loss of production, it also represents a potentially lethal danger to humans exposed to cattle feces or unpasteurized milk.

THE ORGANISM

There are thousands of different strains of Salmonella, some of which are species-specific, and others that infect multiple species. It is possible for a rodent population to serve as a reservoir of infection, which interferes with efforts to control an outbreak.

All types of Salmonella are gram-negative enteric (gut) bacteria that are facultative intracellular parasites. They normally live in the gut, and typically only cause disease after stressful conditions such as pen moves, calving, overcrowding, weather swings, or high-protein diets. Salmonella can live inside the host animal's cells, where it is difficult to build up an effective concentration of antibiotics.

Salmonella is typically spread through fecal-oral transmission, where an animal that is shedding either contaminates a feed space or water trough, or there is some other contamination of the feed, either with equipment or on a worker's boots or some other fomite. Cattle have also been known to shed Salmonella in the milk, which is a potential source of infection for young calves or humans. Animals with clinical disease are not the only potential shedders -there may also be carriers who shed the organism but do not appear abnormal in any way.

THE DISEASE

A variety of clinical presentations are seen. The most common is a watery to mucoid diarrhea with or without the presence of blood or blood products. The animal may or may not have a fever, and septicemia is common due to the violation of the gut integrity. This presentation can be seen in both adult cattle and youngstock. Salmonella can also lead to gangrene of distal limbs or pneumonia in calves, and abortions in adult cows.

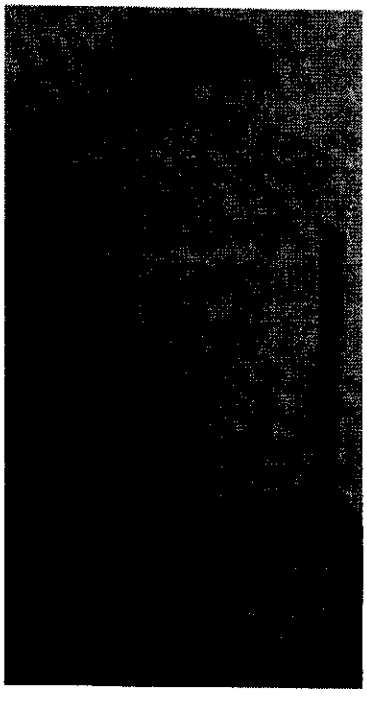
Diagnosis of Salmonella is most commonly made through serial bacteriologic cultures. Multiple cultures are performed, because the organism is difficult to grow in the lab, and the profuse diarrhea that is common with the disease dilutes the sample.

Treatment of sick animals is geared primarily toward supportive care, including IV fluid therapy and anti-inflammatory drugs such as flunixin. Antibiotics are also useful to combat the septicemia, although there is some debate as to whether this may lead to more chronic shedders.

PREVENTION

Ultimately, Salmonella is not an individual cow problem for most dairymen. It is an indicator of management failures in ameliorating stress and in feed and manure management. When you are dealing with a Salmonella outbreak, it is vital to address these areas.

There is a new vaccine technology that has been revolutionary for some of our dairies. The label claim for SRP vaccine is that it "effectively helps control infection and fecal shedding of Salmonella Newport resulting in reduced disease incidence and improved herd performance." If you are not using SRP vaccine, or have questions about Salmonella and its possible effects on your herd, discuss it with your herd veterinarian.



Calf Diarrhea:
Treatment of Dehydration and Metabolic Acidosis

Calfhood diarrhea is one of the major problems faced on a dairy in the first month of life. There are numerous causes, including toxic causes and viral, parasitic and bacterial infections. It may be difficult to determine the cause of the diarrhea, but the age of the calf is an important clue.

Regardless of the inciting cause of diarrhea in young calves, one of the most critical factors in the treatment of the calf is correcting the dehydration and metabolic acidosis that arises from the loss of fluid and bicarbonate in the diarrhea. With their young age, low amount of fat deposits, and high metabolism, calves suffering from uncorrected dehydration have a poorer prognosis and a worse outcome than calves that are treated with supplemental fluids and electrolytes. Signs of dehydration and metabolic acidosis in calves may include depression, sunken eyes, and the inability to stand or hold their heads upright.

There are transient cases of diarrhea where the animal is still bright and alert and suckling. These cases probably require little more than observation to ensure that the condition does not worsen.

In slightly more severe cases of diarrhea, where the animal is only slightly depressed and lethargic but is still standing and suckling, it is appropriate to give supplemental fluids and electrolytes orally. These can be given by bottle after the calf has consumed its milk or milk replacer. The oral fluids should contain appropriate levels of electrolytes and some supplemental energy source. Tubing the calf ensures that it gets the entire treatment, but may needlessly stress the calf, unintentionally leading to a worsening of the condition. We typically recommend against tubing sick calves as it usually causes more problems than it cures.

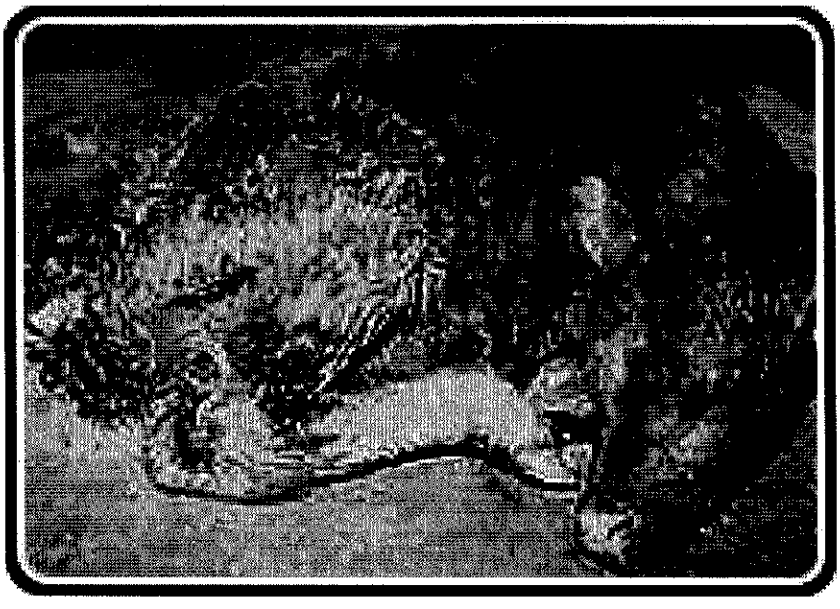
A severely depressed scouring calf probably requires IV fluids to correct the acidosis and dehydration. These fluids should supply not only a supplemental source of water and bicarbonate ions, but probably also other electrolytes such as sodium and potassium, and in the winter an energy source such as dextrose.

Other treatments for the calf, such as antibiotics or anti-inflammatory drugs, may be used as well, depending on the suspected cause. Success in treating calves with diarrhea depends primarily on early diagnosis and intervention.

Preventing the calf from getting severely ill is much more effective and cheaper than the aggressive treatment that severe illness requires.

During an outbreak of calf diarrhea, it is also very useful to examine the management procedures that may have exposed the calf to the inciting cause of the diarrhea, and look at the colostrum management practices.

If you have any questions about this article, or concerns about the procedures for treating diarrheic calves on your dairy, discuss them with your herd health veterinarian.



+This severely sick animal is desperately in need of intravenous therapy to correct dehydration and metabolic acidosis.

Basics of Pharmacology:
Principles of Antibiotic Therapy

Antibiotics are some of the most widely used and misused pharmaceuticals of the last century. I say misused not in the sense that they are abused, as are some other drugs, but misused in that they have often been used in ineffective and inefficient ways. This has led in part to the bacterial resistance to antibiotics that has the medical community and the public concerned, and has also led to enormous amounts of money wasted on antibiotics that were either not needed, or were used incorrectly.

One of the first principles of antibiotic use is that you must use them judiciously and appropriately, to either combat or prevent a bacterial infection. The need for an antibiotic to prevent a bacterial infection arises when a secondary bacterial infection is likely, or when a high stress event makes infections likely (such as the use of Nuflor to prevent shipping fever in calves, or the use of a dry tube to prevent mastitis in dry cows). Antibiotics are ineffective and useless as a treatment of a primary viral or parasitic problem, and their use in these cases is wasteful and unwarranted.

Another principle that prescribers and users of antibiotics need to understand is that antibiotics are usually not effective in defeating an active infection in an animal by themselves. The animal also needs an effective and competent immune system to help keep the infection in check.

Because there are many different kinds of bacteria that can cause infections, and several classes of antibiotics that work in multiple different mechanisms, it is important when choosing an antibiotic to choose one that is effective against the bacteria. If you have a culture and sensitivity result, this choice is a little easier, but often you have to make the decision without having this data, and you have to choose an antibiotic based on what common organisms might have caused the diagnosed condition. As an example, you would not normally choose a penicillin mastitis tube to treat a suspected hot or coliform mastitis.

Not only is it important to choose the proper antibiotic, but you must use it correctly. If the antibiotic level in the infected tissues does not exceed a certain level (called the Minimum Inhibitory Concentration or MIC) it will not be strong enough to help the animal fight the infection. It is also vital that the MIC be exceeded for a long enough period of time. If the MIC is not met, or the treatment regimen is too short, not only will the infection likely return, but the chances of antibiotic resistance are greatly increased, and the next course of therapy is that much less likely to be successful. If you and your hospital staff use the labeled prescription instructions and the protocols you and your veterinarian have developed, MIC should not be a problem you need concern yourself with. This means using the labeled mixing instructions (if necessary), the labeled dose, the labeled route and administration techniques. When the prescription says give no more than 10 cc per any one spot, do not give more than 10 cc per injection site.

Metabolism of antibiotics, and excretion of them from the animal's body occurs through multiple organ systems and at different rates depending on the drug used. Each antibiotic has set withholds for meat and milk that have been determined based on standard proper usage, and variation in administration techniques can affect the withholds. If the labeled instructions are followed, violations are unlikely to occur. This depends not only on proper usage, but on accurate documentation.

The most important step to take to ensure that antibiotic usage on your dairy is safe for the food supply and effective (so that you're not wasting money) is to have one or more discussions on treatment protocols with your veterinarian and hospital staff. This discussion should include how a diagnosis is made for different conditions, what antibiotics are being used for each condition, how they are being used, and what records are being kept of their use in each animal treated.

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Feel free to contact us, or talk with your herd-health veterinarian about any questions or feedback you have on our newsletter or any of our services. We're here for your benefit.

A newsletter for California milk makers

Announcements:

Hoof School, Spanish Language Lecture, Preparing for Winter

Hoof School

Our annual hoof school will be taking place in early December. This program is taught by Dr. Jan Shearer, and we have had a lot of positive feedback over the last several years from our clients who've had employees participate. There is usually 1 day of lecture, including some practical examples on cadaver feet and handouts in both English and Spanish, and then 2 days of practice on a couple of volunteer dairies so that participants gain valuable practical experience.

There are still a few spots available, and if you are interested, contact either your herd veterinarian, or call the Valley Veterinarian office at 686-1447.

Spanish Language Lecture

The topic of our Spanish Language Lecture scheduled for October 25 is Bovine Respiratory Disease. Lunch is included for participants. Call our office to enroll your herdsman or hospital staff.

Preparing for Winter

This is the time of year to start thinking about preparations for colder wetter weather. If you use Orbeseal seasonally, this is the time to start using it on your dry cows, because cows you dry now will be freshening in the winter. You should also take care of any problems in your open-lot pens. Now is the time to repair holes and areas with poor drainage, before they are full of water and are a potential source of mastitis and other disease.