

SEPTICEMIA IN CALVES

By

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INTRODUCTION

Occasionally a calf develops infection in which bacteria or their toxins get into the bloodstream and travel throughout the body, creating a condition called septicemia.

Some toxin-forming bacteria rapidly cause death.

The calf goes into shock when internal organs are damaged and start shutting down, and in some instances the infection may localize, creating internal abscesses, or may settle in the joints — causing a painful arthritis (“joint ill”).

“Endotoxemia caused by clostridial bacterial (such as *C. perfringens*) is not a true septicemia, in this instance it’s just the toxins of the bacteria getting into the blood.

Septicemia can be a common sequel to many types of scours, however, such as infections with *E. coli* or salmonellae. The salmonellae are highly pathogenic and invasive, and tend to go septicemic more than some other types of scours,”

A septic infection may originate via the navel stump in a newborn calf, or from ingested pathogens via the digestive tract, or the lungs (pneumonia that progresses into septicemia). Calves with adequate passive transfer of immunity (antibodies from the dam’s colostrum) are less likely to develop septicemia than calves who don’t ingest adequate colostrum in a timely manner.

Clean calving areas (to reduce incidence of navel infections and the number of pathogens ingested by the newborn calf) and nutrition of the dam are ways to help prevent incidence of septicemia. If cows have adequate protein and trace minerals they create much better colostrum than cows that are nutritionally deficient.

The number one risk factor for septicemia in calves is complete or partial failure of passive transfer. The calf does not get adequate antibody protection from colostrum. “One thing I always stress to producers and veterinary students is the importance of recognizing calves that are at higher risk for neonatal diseases, including respiratory disease, scours and septicemia because they may not be able to absorb antibodies appropriately or sufficiently.

Even though they may get enough colostrum or you gave them enough, they may not absorb antibodies as well as they should,”

“High risk calves include twins, calves delivered by c-section or with any dystocia, calves born to cows that are sick, or malnourished. The number one thing to do with a high-risk calf is feed him one to two pints of colostrum immediately after birth,”. Don’t wait for him to try to get up and nurse; just feed him colostrum by nursing bottle — or by tube if he is unable to suck.

“The reason for only giving one to two pints is that it will get him started.

It’s not enough for obtaining the full amount of antibodies or energy needed, since the average-size beef calf needs about two quarts of colostrum in the first 12 hours of life. But it will give him the energy to get up and try to nurse. If you feed more than two pints he may not be hungry anymore

“It’s rare to see septicemia in calves that get good passive transfer.

Even navel infections occur less frequently in calves that have adequate immunity.

However, it’s important to remember that if a calf is born in a dirty enough environment he could get a navel infection and possible septicemia in spite of good passive transfer. There are three primary ways bacteria gain access to the body and pose a risk for septicemia.

ALSO, A calf with pneumonia, for instance, may develop septicemia.

Any scours, viral or bacterial, can result in damage to the intestinal lining that may allow bacteria like E. coli or salmonella to invade the tissues —

Importance of colostrum

“Cells that absorb antibodies from the colostrum, in the GI tract are called M cells. They take in the antibodies right after birth in a process called pinocytosis.”

This aids the movement of antibodies through the wall of the intestine and into the circulatory and lymph systems. “Pinocytosis is a process where the M cell in the intestinal lining grabs/ingests material within the GI tract.

It internalizes that material, which is then passed through the cell and onto the bloodstream. Anything that’s in the GI tract soon after birth can be moved straight into the bloodstream. If the calf ingests pathogens in his early attempts to find the udder — nuzzling the cow’s dirty legs or flanks — these pathogens can go right through into his bloodstream as well.

It’s always a race between pathogens and antibodies until the intestinal lining “closes” and these large molecules and bacteria can no longer slip through.

“If bacteria are ingested first, this is what the calf is taking into bloodstream.

If colostrum intake is delayed, it’s just that much longer that the body is vulnerable, and behind in the race to control bacteria .

Ingestion of colostrum stimulates the “window” to start closing. If you can get colostrum into a calf quickly, this helps close the window and prevent pathogens from getting through the intestinal lining. It also provides antibodies in the blood that can bind to and help destroy any bacteria or toxins that do get absorbed.

Years ago people thought a calf had 24 hours to absorb maternal antibodies, but studies showed that right after birth the rate of pinocytosis decreases.

A calf has maximum antibody absorption if he nurses within the first 15 to 30 minutes. And absorption rate is still excellent if he nurses within the first hour.

By four hours of age, however, the average calf has lost about 75 per cent of his ability to absorb antibodies. Also, once he starts to nurse, gut “closure” is hastened. This is nature’s way of making sure nothing else slips through.

If cows must be confined for calving (rather than out on clean, grassy pasture) it pays to have dry, clean bedding to help keep udders and flanks clean. Otherwise the calf will ingest high numbers of pathogens in his attempts to find the teats and nurse. “Another thing many people don’t realize is that quality (antibody concentration) of colostrum goes down fairly rapidly after a calf is born.

The colostrum you might milk from the cow four hours after birth is not as rich as what you might milk within the first hour.

This is why it’s very important to identify high-risk calves and make sure you get colostrum into them as soon as you can, definitely within the first hour.

Signs of septicemia

The septic calf is usually dull, off feed, and may become weak and lethargic.

“The calf may or may not have a fever. Temperature may be high, normal, or low.

Often hydration status is good, however, compared with a calf that has scours.

fever does not necessarily mean a calf is septic.

A local infection can trigger release of inflammatory products that elevate body temperature. Later, if the calf starts going into shock, the temperature drops and extremities become cold because his circulatory system is failing.

“When a sick calf comes to our clinic our first question is whether this calf is sick because has scours or is septic, or both? A calf with scours will have profuse diarrhea and will be dehydrated; his mouth will feel dry, eyes appear sunken, and if you pinch the skin along the neck it stays tented for a moment rather than sinking right back into place.

By contrast, a weak calf that’s not nursing but is not dehydrated, is very likely septic. That calf hasn’t lost much body fluid, but is weak and staggering because of the septicemia or toxemia attacking his whole body.

If this continues, ‘ll go into shock and die because the internal organs are shutting down. “To tell if a calf is septic, look at mucous membranes and the sclera around the eye. Mucous membranes on the gums will be dark or red, instead of pink like a normal calf. Blood vessels under the surface may be getting bigger and standing out. This is part of the inflammatory process. Blood vessels of the sclera around the eye are prominent and dilated, making the eye look bloodshot .

Treatment

septicemia is very hard to treat. “Often by the time you realize the calf is sick, it’s too late. The whole body is under attack and stress.

When you find a septic calf you are usually way behind the eight ball,”.

“Often when we see septicemia, it’s because a bacterial infection is not responding (not susceptible) to the antibiotic being used for treatment of scours, pneumonia, navel infection, etc. Bacteria have gained entrance to the bloodstream, often in spite of antibiotics we were using for something else.

The antibiotic sensitivity test must be carried out to make sure we can treat with something that will work, or change to a different antibiotic that will work better than what we’re using

“We have lots of over-the-counter antibiotics that may be applied inappropriately (without first having a proper diagnosis) or may not work against that specific pathogen. One of the problems is that even if we collect samples to identify which bacteria it might be, we can’t wait for results. Correct diagnosis and correct selection of antibiotic is crucial,”.

Otherwise you might be treating the calf for quite awhile and still going downhill — and you may lose the calf. “Sometimes ranchers use two antibiotics together that work against each other, or choose the wrong one for that particular infection.

You certainly have to give the calf something to start treatment. I also know that in many cases the rancher

doesn’t call the veterinarian.

This is part of the dilemma in treating septicemia — the difficulty in having correct diagnosis and proper antibiotic,”.

There are a number of antibiotics that may be effective. “What you choose boils down to personal experience and preference, and recommendation from a veterinarian,”

“Some of the antibiotics that might be tried include oxytetracycline and Naxcel.

Some people report success using Nuflor or even Draxan, but we don’t have much information yet in determining whether those are good drugs for treating septicemia. The most common drug we use here in our patients for treatment is (Naxcel), “Generally you’d use an injectable drug because oral drugs may not be absorbed well in a septic calf. The gut may even be shut down,”.

“In some cases you may need a higher dose than labelled — an extra-label dose.”

Therefore you need to be working with your veterinarian on a case-by case basis, because all these antibiotics (exceptoxytetracycline) are prescription drugs that can only be used on the order of a veterinarian.

“Calves that are seriously ill will benefit from low doses of Banamine to reduce inflammation. The dose should be lower than what’s recommended on the label, and here again you should work with your veterinarian on dosage.

If you give a low dose, it’s less likely to cause kidney damage or GI ulcers.

Calves that are in shock will need IV fluids as part of treatment. “The antibiotics and Banamine will also help, and we have to get some energy into the calf, if he’s not nursing. how much milk to feed. Usually the best course is to give small volumes of milk frequently. You don’t want to give more than the compromised GI tract can handle.

If you distend the stomach too much, the milk won’t move through and you create more problems,” A daily amount of milk that comprises 10 per cent of the calf’s body weight, and dividing this into multiple feedings.

“If you can get six feedings into the 24-hour period, give one-sixth of that daily ration each feeding. If you can get eight feedings per day, that’s even better.