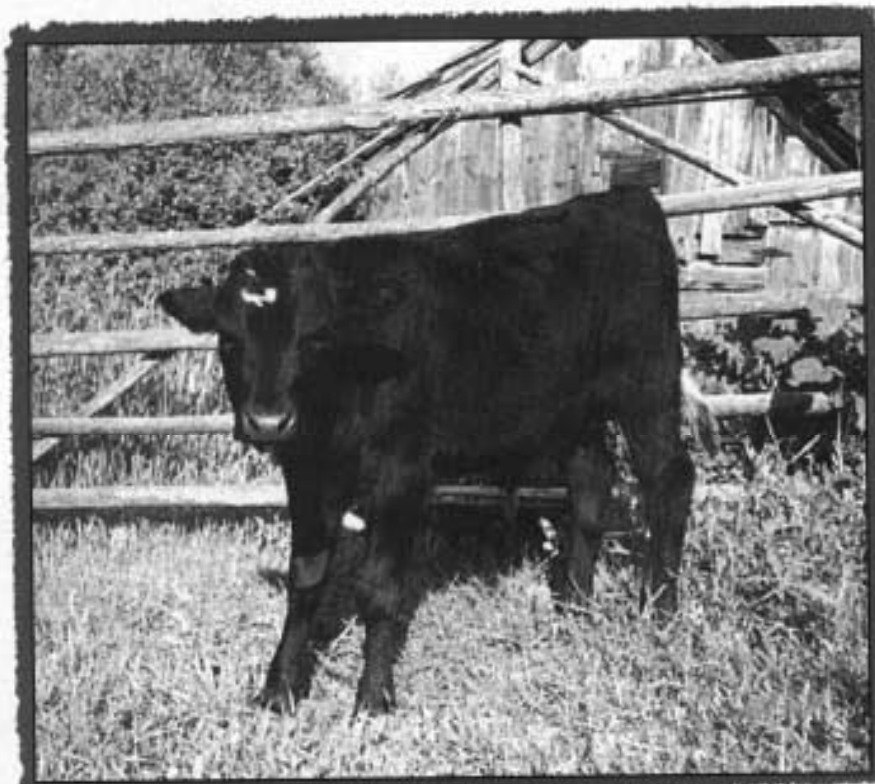


Dealing With PNEUMONIA In Young Calves

Pneumonia is the No. 2 killer of young calves.

Lung infections can be swift and deadly, or mild, depending on the causative pathogen, stresses to the calf, and the calf's immune status. Many cases will take a day or more to severely affect the lung tissue, giving you a chance to treat and save the calf if you can detect the problem early.

BY HEATHER SMITH THOMAS



Young calves are often most susceptible to viral pneumonia between 2 weeks and 2 months of age, says Terrebonne, Ore., veterinarian Heidi Smith. However, she adds, stress can hinder immunity, leaving calves vulnerable to pneumonia, at any age.

Setting the stage

The organisms that cause pneumonia are often present in the calf's environment at all times. Usually the calf's immune system can keep them at bay, says Heidi Smith, veterinarian at Terrebonne, Ore. However, the organisms can get the upper hand if the calf's immunities are poor due to inadequate antibodies from colostrum (see February issue, page 252) or lowered resistance due to stress. Any severe stress such as wet, cold weather; sudden weather changes; overcrowding; high contamination; or previous illness can set the calf up for pneumonia infection.

That's why pneumonia often follows on the heels of a bad case of scours, says Smith, especially if weather is wet, cold or windy.

"The scours wear him down and lower his resistance, then the pneumonia-causing pathogens move in and set up shop in respiratory passages and lungs," she says.

A newborn in a drafty barn, a young calf in a barn with dusty bedding or a calf in a moist barn with poor ventilation, saturated bedding and high humidity is a prime candidate for pneumonia.

Breathing in too much amniotic fluid at birth, with fluid settling in the windpipe and lungs, is also a causative factor, making it easier for pathogens to invade these tissues. Cold weather can result in pneumonia if calves don't have enough shelter and suffer from cold stress.

The invaders

The initial illness is often the result of a viral infection, says Robert Cope, veterinarian at Salmon, Idaho, "but pneumonia severe enough to cause death is almost always bacterial. Since viruses are not affected by antibiotics, treating calves that are marginally ill is primarily to prevent bacterial pneumonia from starting, rather than to cure the viral infection that causes the initial symptoms."

The doorway for bacterial pneumonia can be opened by many viruses, including IBR (infectious bovine rhinotracheitis), BVD (bovine viral diarrhea), PI₃ (parainfluenza-3), BRSV (bovine respiratory syncytial virus) and others.

"Like just about all viruses, these are most likely to become rampant when calves

are under stress and in close contact with other calves," warns Cope. The actual killer is usually a bacteria that moves in after lungs are damaged by the virus. Streptococcus, mycoplasma, pasteurilla, chlamydia and other bacteria can be opportunistic secondary invaders.

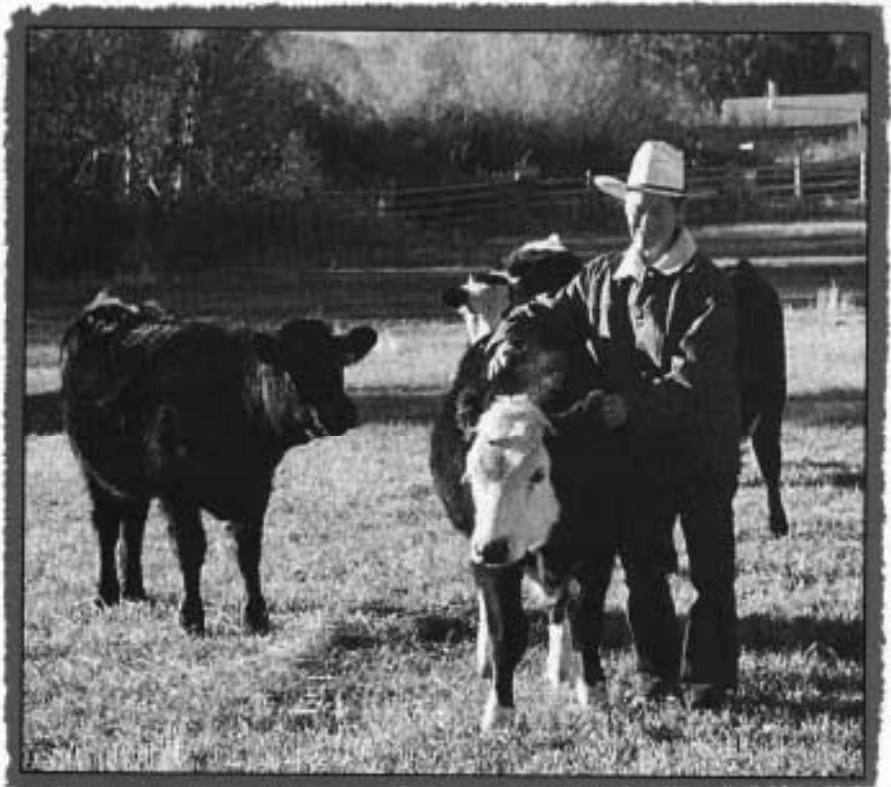
Young calves are often most susceptible to viral pneumonia between 2 weeks and 2 months of age, "when their temporary immunities from colostrum antibodies are starting to decline and before they have developed a strong immune system of their own," says Smith. However, she adds, stress can hinder immunity, leaving calves vulnerable to pneumonia, at any age.

Some viruses can make calves pretty sick by themselves, even without bacterial complications, says Cope. But often after a viral pneumonia gets started, bacterial invasion occurs, creating more severe infection. Secondary bacterial pneumonia will usually respond to antibiotic treatment, but relapses are common if viral infection is extensive.

Viruses tend to reduce resistance of the mucous membranes, allowing bacteria to invade the tissues. Viruses can also destroy the hair-like cilia in the bronchial tubes that help keep the lower respiratory tract free of harmful pathogens; damage by viral infection thus makes the airway more vulnerable.

"While outward signs of sickness usually spur the rancher to grab a bottle of antibiotics, the real threatening damage is going on inside the calf's respiratory tract unseen," says Cope. The windpipe is lined with cilia, which are in constant motion, moving like waves on the ocean in an incessant upward sweep," he says. They constantly move dirt and bacteria out of the windpipe into the back of the throat where they can be safely and easily removed from the body.

When viruses damage these cilia, they can no longer defend the lungs. The main bacterium to take advantage of the situation is *Pasteurella haemolytica*, says Cope. "Since these bacteria can always be found in the nose and sinuses of normal, healthy cattle, they are always available to move down the windpipe after damage to the cilia has



Author Heather Smith Thomas and her husband, Lynn, operate a commercial cow-calf operation near Salmon, Idaho.

occurred. As soon as they move into the lungs, pneumonia begins almost immediately," he says.

Unlike viral infections, Pasteurella pneumonia "is quite likely to kill the calf unless therapy is promptly begun," says Cope. "Once lung damage exceeds 15 percent of lung capacity, the calf will not grow properly even if it does survive. Aggressive, immediate antibiotic therapy is crucial."

Cattle don't have strong lungs, and calfhood pneumonia can be a tough battle to fight unless you catch it early, says Smith. Once the lungs are damaged and fill with fluid, the calf may be hard to save. It will need aggressive treatment and intensive care. It's very important to spot early warning signals. With early detection and diagnosis, pneumonia will be a lot easier to clear up than if you delay treatment until the calf is in serious trouble.

What to watch for

A calf with pneumonia usually goes off

feed, lies around a lot, or stands humped up, depressed and dull. It won't be very active, and it will move slowly because it's in pain, says Smith. Ears may droop instead of being perky and alert. The calf won't care what's going on around it; it's concentrating on its pain and discomfort. It's easier to sneak up and catch the sick calf than to approach a healthy, lively calf.

Respiration rate may or may not be elevated. In mild cases, the infected calf may have a cough and slightly noisy breathing. In a more severe case, the calf will have difficulty breathing and may even breathe with its mouth open or with grunting sounds as it forces air out of impaired lungs, says Smith. If it is breathing fast, or labored, the calf is in serious trouble, she warns. It may or may not have a nasal discharge. What nasal discharge there is may be clear or thick and snotty.

Some cases of acute viral pneumonia will die within a few hours, but many cases of uncomplicated viral pneumonia will recover in four to seven days, she says.

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If bacteria are involved, however, the fever, difficult breathing and toxemia will be worse. Depending on the type of bacteria involved, the calf may develop abscesses in the lungs, or relapse following treatment—with coughing, difficult breathing, lack of appetite and emaciation.

Not all cases of pneumonia start out with viral infection. Some acute cases are caused by bacteria alone, says Smith. These cases are characterized by severe toxemia, fever, difficult breathing and grunting. Treatment must be given early and diligently to save calves.

Treat a fever

Any calf with a fever should be treated with antibiotics and doctored for possible pneumonia. Get into the habit of carrying a thermometer with you when checking calves, says veterinarian Heidi Smith, Terrebonne, Ore.

Sometimes you can tell a calf has a fever by feeling its nose or the inside of its mouth. But during cold weather, this is not a sure test, nor is respiration rate. A calf with pneumonia in cold weather may not be breathing fast and may have a cool nose. The best way to make an accurate diagnosis is to take the calf's temperature.

An animal thermometer or human rectal thermometer works fine. Tie a string to the end of the thermometer so you won't lose it in a calf's rectum. Keep it in a thermometer case to prevent breakage when carrying it in your pocket.

Before using, shake the thermometer down. Lubricate it with a little saliva so it will slip easily into the calf's rectum without causing discomfort. Leave it in at least 2 minutes for an accurate reading.

Normal temperature is 101.5°F. Anything over 102.5° should be considered abnormal — keep close watch on the calf. If it has a temperature higher than 103°, it is definitely sick. Anything over 104° should be considered serious.

Calves affected with respiratory viruses often run high fevers, says Cope, usually between 104° and 108°. On the other extreme is a calf with sub-normal temperature, which means it is very chilled or has been sick awhile and is dying or going into shock.

Another clue to calf pneumonia is that the calf won't feel like suckling so the cow won't be nursed out. If a cow has a full udder, check her calf closely to see if it has scours or pneumonia. If it's not scouring but doesn't feel well, take its temperature.

Treating pneumonia

Viral pneumonia not complicated by bacteria won't respond to antibiotics, but every calf with viral pneumonia should be treated anyway because of the high probability of secondary bacterial infection, advises Cope. Use a broad-spectrum antibiotic.

Cope says penicillin or oxytetracycline have been used to treat pneumonia for decades. "Even today, the most-often used antibiotic is LA-200® (oxytetracycline). It still works well, especially if given in conjunction with sulfa."

If this therapy works, Cope doesn't advise changing to a newer drug. "However, all ranchers should be aware of several new drugs that have become available in recent years —including Naxcel® and Micotil® — which have proven quite effective against *Pasteurella*."

If you have stubborn cases of pneumonia that don't respond well to the drugs you've been using, ask your veterinarian for advice on changing antibiotics.

Early treatment of pneumonia can help prevent the development of incurable complications such as abscesses in the lungs, inflammation of the lung lining, chronic dilation of the bronchial tubes or suppurative pneumonia (producing pus).

Good supportive treatment and intensive care are just as crucial as the right antibiotics and may make the difference in whether you save or lose the calf. Put sick calves in a dry place, out of the wind and wet weather — in a heated barn, under a heat lamp or wherever they can be kept warm and dry. Sick calves also need plenty of fluids, especially if they have high fevers. This will mean force-feeding calves that aren't nursing. They may also need medication to reduce pain and fever and to ease breathing.

Giving fluids is crucial if a calf has a fever (which dehydrates) or if using any sulfa

drugs in treatment. Giving sulfa to a dehydrated calf can cause kidney damage, warns Smith, since sulfa is broken down and eliminated through the kidneys. There must be adequate fluid in the body or the sulfa will crystallize in urine and cause irreversible kidney damage, killing the calf.

If the calf's having trouble breathing, you may want to inject an expectorant (breaks up the congestion in the lungs).

When treating pneumonia, it really helps to reduce the calf's pain and fever, says Smith. The calf will feel better and start nursing and eating again sooner, getting the fluid and energy it needs. If it will nurse, it saves you the trouble of force-feeding.

Several drugs can reduce pain and fever, including aspirin and steroids, but the latter can hinder the immune system. A good drug for relieving pain, fever and inflammation is Banamine™ (flunixin meglumine), often used for horses with colic. It will reduce the calf's coughing, respiratory rate, fever, discomfort and lung congestion, says Smith, and can be given I.V. or intramuscularly. It is expensive, but it doesn't take much for a young calf (1 cc/100 lb.).

You can also use regular human aspirin (two tablets for a small calf) dissolved in warm water and squirted into the mouth, but it must be given several times a day to be effective.

Be diligent with antibiotic treatment when dealing with calf pneumonia. Make sure you keep antibiotic blood levels high enough to adequately combat the infection. And don't quit too soon. The calf may be getting better, its fever may be down and it may be eating again, but don't be tempted to stop treatment.

Keep the calf on the antibiotic for at least two full days after all symptoms are gone and its temperature returns to normal — especially if it was a bad case of pneumonia — or the calf may relapse, warns Smith. A relapse can be much harder to treat, and chances of saving the calf are reduced.

Persistence is the best weapon against pneumonia. Catch it early, doctor diligently and stay with it until you are sure the calf has fully recovered.

