

## Livestock Health Series

# Bovine Respiratory Disease

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### Introduction

Bovine respiratory disease (BRD), also known as shipping fever or pneumonia, has been estimated to cost the U.S. cattle industry over \$500 million each year. Backgrounding and finishing operations bear the majority of the costs, which stem from treatment expenses, reduced performance and death loss. This disease complex is the single biggest killer in the United States among newly weaned cattle with several factors playing a role.

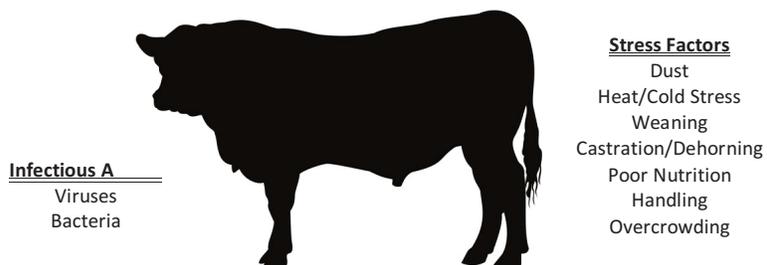
BRD is typically caused by a combination of viruses, bacteria and stress (Figure 1). Research has shown that stress plays a major role in morbidity rates associated with BRD. Stressors for cattle, including respiratory irritation from dust, overcrowding, dehorning, castration, commingling, poor nutrition, transport, weaning and handling, can contribute to the onset of illness. The immune status of the individual animal determines the severity of illness.

Viruses play a key role in initiating BRD. Usually, a viral infection is the

primary or initial challenge to the respiratory tract, especially the upper respiratory tract. The most common viral agents that play a role in respiratory disease are infectious bovine rhinotracheitis (IBR), bovine viral diarrhea (BVD), parainfluenza type 3 (PI3) and bovine respiratory syncytial virus (BRSV). The latter, BRSV, is of particular concern because viral particles directly invade the lungs. These viruses enter the respiratory tract through the nose or mouth and quickly impair the protective barriers of the trachea and lungs. With the protective barriers gone, opportunistic bacteria are allowed to multiply and infect the respiratory tract, which causes inflammation and tissue damage. Most animals that have a healthy immune system can successfully fight off a viral infection, thus avoiding severe disease. However, cattle with immune suppression due to stress factors are not able to combat viral infection efficiently.

*Mannheimia haemolytica* (formerly known as *Pasteurella haemolytica*), *Pasteurella multocida* and *Haemophilus somnus* are the

**Figure 1. Many factors play a role in BRD.**



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bacterial agents most commonly identified in advanced cases of BRD. Another opportunistic bacteria, *Mycoplasma bovis*, has been isolated in cattle with chronic pneumonia. All of these bacteria flourish after an initial viral infection when stress factors have weakened the animal's immune system. Each of these bacterial agents has unique mechanisms that cause illness in cattle and must be treated accordingly.

## Clinical Signs

Clinical signs commonly associated with the disease are a runny nose, decreased appetite, lethargy, separation from the herd, a gaunt appearance, an increased respiratory rate and coughing. On exam, the veterinarian may hear crackles and wheezes in the chest when listening with a stethoscope. Animals often have a rectal temperature of >104°F. In some cases, cattle may have sores in the mouth or on the nose that may further contribute to the decrease in appetite and performance.

Early detection and treatment of respiratory disease is essential. If treatment is delayed, it will likely increase the number of deaths or chronically infected animals in the herd. As the disease progresses, severe lung damage occurs from inflammation caused by the infection. Often, the lung damage that takes place with this disease is irreversible. That is why early detection and early treatment with antibiotics and anti-inflammatory medication are important.

Calves should be observed each morning for signs of disease and a clinical score should be assigned to the calves exhibiting signs of illness (see Table 1). All potentially ill calves should be evaluated for a fever via a rectal thermometer. The normal temperature for cattle is 101°F-102.5°F. It is important to note that cattle can exhibit a fluctuating body temperature based on the time of day and the temperature of the environment. Therefore, it is best to check cattle in the morning hours when those factors are least likely to affect the body temperature. All calves showing a rectal temperature of 104°F or greater or calves exhibiting a clinical illness score of greater than 2 (regardless of rectal temperature) should undergo treatment with an appropriate antibiotic determined by your veterinarian. For each sick calf, a treatment card should be prepared that includes the date, calf number, the clinical illness score and the antibiotic treatment administered. Record keeping allows for tracking treatment expenses and provides for better compliance with drug withdrawal periods. Consult with your veterinarian to assist with establishing an antibiotic treatment.

**Table 1. Clinical Illness Scores (CIS) for Calves**

Score	Description	Appearance
1	Slightly ill	Mild depression, gaunt, +/- ocular/nasal discharge
2	Moderately ill	Ocular/nasal discharge, gaunt, lags behind other animals in the group, coughing, labored breathing, moderate depression, +/- rough hair coat, weight loss
3	Severely ill	Severe depression, labored breathing, purulent ocular/nasal discharge, not resistant to human approach
4	Moribund	Unresponsive and near death

## Mass Medication

Medicating a large group of animals in a high risk disease situation is called metaphylactic antibiotic therapy or metaphylaxis. Although regulations regarding metaphylaxis are becoming more restrictive due to the development of resistant bacteria, the practice is still allowed with supervision from a veterinarian who will be required to provide justification for use of the antibiotic. In general, metaphylaxis is recommended when more than 10 percent of the animals exhibit clinical signs of BRD at receiving. Depending on the product used, the mass medication can last for a few days up to two weeks. After the initial treatment, only animals with continued clinical signs will receive additional antibiotics. This type of therapy must be documented vigilantly by the veterinarian in order to comply with federal regulations.

## Prevention

Control and prevention should focus on vaccination and herd management. Respiratory virus vaccines are available in several different combinations with or without bacterins. On cow-calf operations, it is ideal to vaccinate calves before three months of age to decrease the likelihood of a disease outbreak. Stocker cattle should be vaccinated as soon as possible upon receiving, typically after a brief resting period (usually 12 to 24 hours). These cattle should receive a booster injection two to four weeks following the first injection to ensure disease protection. Your local veterinarian can help you decide which vaccines are right for your particular herd. As always, read and follow the label for the vaccine as many vaccines require two injections for disease protection.

Vaccines for the aforementioned bacterial causes of BRD are also commercially available. Many producers and veterinarians have differing opinions on how effective these bacterin vaccines are for cattle operations. Since situations vary from farm to farm, consult with your veterinarian about the vaccination requirements for your particular operation. It is always more cost effective to prevent respiratory disease than to treat it.

Decreasing the number of stress factors associated with this disease is also important for prevention. This is achieved through herd management. Avoiding overcrowding is the simplest step. Recognizing illness by daily observation is important for quickly separating sick animals from the rest of the herd. Strategically timing castration and dehorning when calves are in peak health also greatly reduces stress. The less an animal is exposed to stress factors, the more likelihood the animal will have an immune system capable of combating disease.

Preconditioning is the method of preparing young calves on the origin ranch to face the challenges of

weaning, marketing and transport to the feedlot. The method entails weaning calves at least 45 days prior to sale, castrating early and following an appropriate vaccine program. In addition, deworming and creep feeding acclimates the calf to new feedstuffs and provides optimal gut health. Studies have shown that preconditioned cattle have much lower BRD morbidity rates than cattle not preconditioned. Although this type of production requires management and expense on the part of the cow-calf producer, it is becoming the standard of care for animal welfare.

## Summary

Prevention of bovine respiratory disease relies on herd management to reduce cattle stress and a well-planned vaccination strategy. Successful control of bovine respiratory disease includes early detection and isolation of sick animals and proper treatment under the supervision of a veterinarian. For more information about cattle diseases, contact your local county extension office.

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