



Cattle Producer's Handbook

Animal Health Section

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Bovine Respiratory Disease

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Disease of the respiratory tract is a major problem for cattle that continues to cause serious economic losses for producers. Bovine respiratory disease (BRD) causes increased death losses as well as medication costs, labor, and lost production. Many different infectious agents may cause similar clinical signs. Multiple agents are often involved in the development of BRD.

Disease Conditions (or Syndromes)

The respiratory diseases of cattle can be divided into three main categories:

1. Upper Respiratory Tract Infections

These infections cause inflammation of the nostrils, throat (pharynx) and windpipe (trachea). The clinical signs are usually mild and involve coughing, nasal discharge, fever, and a decreased appetite.

2. Diphtheria

This infection involves the larynx (voice box) and may occur alone or along with other respiratory infections. There are often loud noises during breathing. The swelling may severely restrict the air flow, causing death.

3. Pneumonia (Lower Respiratory Tract Infection)

An infection of the lungs is often due to an extension of infection from the upper respiratory tract (#1) or a failure of the mechanisms that are designed to protect the lungs. This is much more serious and causes more severe signs than does an upper respiratory infection. Shipping fever is one form of lower respiratory tract disease. It derives its name from the fact that it usually occurs shortly after shipment of the cattle.

Causes and Development of Disease

The causes of BRD are multiple and complex, but the three factors of stress, viral infection, and bacterial infection are almost always involved in cases of severe disease. A wide variety of different stressors and agents may be involved in the disease process.

<u>Stress factors</u>	<u>Viral agents</u>	<u>Bacteria</u>
Heat	PI ₃	Pasteurella
Cold	IBR	Hemophilus
Dust	BVD	Other
Dampness	BRSV	
Injury	Adenovirus	
Fatigue	Rhinovirus	
Dehydration	Herpesvirus IV	
Hunger	Enterovirus	
Anxiety	MCF	
Irritant gases	Reovirus	
Nutritional deficiencies		
Surgery		

Some of the viral agents produce only mild clinical signs by themselves, but they may cause severe signs and death when combined with other viral or bacterial agents and stress. Many normal cattle carry one or more of the bacterial and viral agents in their upper respiratory system with no ill effects. These often enter the lungs but are usually expelled or inactivated. However, under stress, the animal's defense mechanisms may be overcome, and the infection established, resulting in BRD. The mixing of cattle from different sources and wide environmental temperature fluctuations have been identified as major factors in the initiation of disease outbreaks in feedlots.

Clinical Signs

The most common signs of BRD are nasal and eye discharges, coughing, fever, decreased appetite, varying degrees of breathing difficulty and noise, rapid breathing, depression, droopy ears, and open-mouthed breathing. These vary greatly, depending on the stage and extent of the disease process.

Treatment

In the past, there have been no drugs effective against viral agents in the treatment of cattle for respiratory disease. Through current research, some products may become available for use in the future. The antibiotics and sulfas have no effect on the viral agents but are often of great aid against the bacterial invaders.

Treatment of BRD will be effective and the death loss minimal if the following principals are practiced: (1) Detect disease early so those ill can be treated and separated to a sick pen; (2) Initiate an effective treatment program promptly and continue treatment on a daily basis; (3) Continue treatment until 48 hours after signs have abated; (4) Change to an alternate treatment if there is no or poor response after 24 to 48 hours, and (5) Provide good nursing care, including cautious handling of both the ill and exposed cattle. Cattle that have had over 50 percent of the lung tissue damaged before effective treatment is started will have a poor response, many relapses, and a high mortality rate.

Group (or mass) treatment may, in some situations, help to reduce the number of cattle severely affected with BRD. It can also delay use of more effective, individual treatment and result in a greater loss. It is preferable to include the antibiotic or sulfa in the drinking water rather than the feed, since the ill cattle quickly go off feed but usually continue to drink water a little longer.

Prevention of BRD

The two major areas to emphasize for prevention are management and vaccination. Of the two, management is usually much more important.

1. Management

Evaluate all the possible causes for stress on the cattle, and determine which ones can reasonably be eliminated or at least reduced. Look carefully at alternative methods of operation and at specific timing of processing, vaccinating, etc. Recognize the critical period for disease detection is the 3 weeks immediately following weaning, placing on feed, or shipping of cattle. Avoid mixing (comingling) cattle from different sources during this highly critical 3-week period. Preconditioning does reduce the rate of illness and death, but this practice must be evaluated in terms of economic costs and benefits for the specific producer involved. Arrange the pens and feeders to keep new cattle close to the feed and water supplies. Don't overcrowd, especially early in the feeding period. Control the dust and mud.

2. Vaccines

Vaccines are available for several infectious diseases of cattle. However, with the various brand names as well as different combinations available, the choice of vaccines can become very complicated. The six respiratory disease agents for which vaccines are available are categorized and briefly described below.

Calves vaccinated under 6 months of age should generally be revaccinated again after that age to provide a longer lasting immunity. It is important to follow the specific directions provided with a vaccine. If two doses are recommended initially, don't count on very much protection until 7 to 14 days after the second dose has been given.

(A) IBR (Infectious Bovine Rhinotracheitis) (Rednose): A viral infection of the upper respiratory tract. It is present in almost all herds, but causes illness in unexposed animals or those with lowered levels of immunity. Many cattle carry the virus and begin shedding it to others during times of stress. This agent is commonly implicated with bacterial agents in causing shipping fever and other severe cases of pneumonia.

Both MLV (modified live virus) vaccines and killed S (or attenuated) products are available. Some are designed for IM (intramuscular) use while others are given IN (intranasally). The killed and intranasal products may be used for or around pregnant cows, but some other vaccines may cause abortions. The IN vaccines will cause some antibody response within 3 days and may be useful even in the face of an outbreak. Two doses of a killed product must be used to confer protective immunity.

(B) PI₃ (Parainfluenza-3): Another viral respiratory agent that causes a relatively mild disease by itself, but a severe problem when combined with a bacterial agent. It is included with all IBR vaccines and can be used on the same schedule.

(C) BVD (Bovine Virus Diarrhea): A common viral agent, present in almost all herds. It may cause respiratory, digestive tract, or reproductive problems. It has a profound detrimental affect on the immune system.

Many MLV vaccines have been available, but they may cause a superinfection in occasional cattle that are already persistently infected. Killed vaccines are now available that stimulate good immunity and avoid this problem. Two doses of these are required initially.

(D) BRSV (Bovine Respiratory Syncytial Virus): A relatively recently recognized disease agent, but now identified all across the country in respiratory infections. It is mainly a problem in weaner and feedlot animals and young dairy stock. Killed virus vaccines are available, with two initial doses required. Modified live virus vaccines are also available.

(E) Pasteurella: A bacteria carried by many normal cattle. It becomes a major cause of severe "shipping

fever” pneumonia when combined with stress and a viral agent. Two species are common: *P. hemolytica* and *P. multocida*. Vaccines available in the past were poor, and use of a single dose caused more problems than if none were used.

Great improvements have been made in recent years and several products are available, with more to come. The killed products require two doses to stimulate protective immunity. Attenuated (modified live) vaccines are also available. One of these must be given intradermally

(within the layers of skin). Follow directions carefully for these products to be beneficial. They must usually be given before weaning to help hold down the occurrence of disease at this critical time.

(F) *Haemophilus somnus*: This agent is the other major bacterial agent involved in shipping fever. It also causes “brain fever” in feedlot cattle (also known as TEME: thromboembolic meningioencephalitis). The killed vaccine must be given in two doses initially and should be used before weaning for the greatest benefit.



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