MANAGEMENT

Vet Call

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Bovine respiratory disease — part 1

Bovine respiratory disease is also known as BRD, pneumonia, undifferentiated BRD and a few other names. A number of factors combine to initiate most cases of BRD. These factors are stress (shipment, social interaction and nutrition), viral infection and bacterial infection. BRD is generally considered to be a disease of feedlot cattle that are trucked to a confinement feeding facility and exposed to new animals and new feed and water sources. Age is also a factor, with recently weaned calves and light stocker calves having higher morbidity (sickness) and mortality (death) rates than yearling cattle.

Economics of BRD

BRD is the primary cause of sickness and death in feedlot operations. In Kansas State University (K-State) research, 67% to 82% of illness in feedlot cattle was due to respiratory disease. Death loss ranged from 0.57% to 1.07% of all feedlot cattle with respiratory disease, accounting for 46% to 67% of deaths.

Death losses, although very visible, are usually exceeded in economic importance by loss in growth rate and carcass value of calves that become ill and recover. A trial from 1994 reported that calves treated for BRD early in the feeding period gained 0.14 pound (lb.) less per day during the entire feeding period compared to penmates that remained healthy. A study in Nebraska showed similar losses, with average daily gain (ADG) being 0.18 lb. less in cattle with lung lesions at harvest compared to those without lung damage.

Pathogens causing BRD

A number of viruses and bacteria have been associated with BRD. In healthy cattle, exposure to any one of these pathogens (germs) would not likely cause disease. Interactions among pathogens and depression of the immune system due to environmental, nutritional or management stress seem to be necessary to cause BRD.

Environmental stressors include heat or cold stress, dust and fumes toxic to the lining of the respiratory tract. Dehydration, exhaustion, rough handling and mixing cattle into new social groups are examples of management stressors. Failure to provide adequate water, energy, protein or minerals causes nutritional stress.

Viral infection usually precedes bacterial pneumonia, though it is not required for BRD. Infectious bovine rhinotracheitis (IBR), bovine viral diarrhea (BVD) and parainfluenza-3 virus (PI_3) are known to cause damage to the lining of the respiratory tract, which causes inflammation and damage to the pulmonary clearance mechanism and allows suitable sites for bacterial replication. The damage is not confined to the upper respiratory tract, but extends to the lung bronchi and alveoli.

In general, bacteria do not serve as a cause of BRD in healthy, unstressed cattle. Damage to the lining of the lung and immune suppression are required for bacteria to colonize the lung and cause pneumonia.

Mannheimia haemolytica is the most commonly isolated bacterial agent in fatal cases of BRD. *Pasteurella multocida* has also been isolated from fatal BRD cases, especially in younger cattle. Both of these bacteria normally reside in the upper respiratory tract and are able to invade the lung only if defense mechanisms break down. Clinical signs of BRD usually develop within 14 days following environmental or management stressors.

Haemophilus somnus has been reported to cause fatal BRD in some areas, and mycoplasma and chlamydia species of bacteria are isolated from some cases of BRD, usually along with other bacterial pathogens known to cause pneumonia (*P. multocida* or *M. haemolytica*).

Arrival processing

Proper handling and management of cattle during processing is essential to minimize stress, to reduce the risk of injury and to detect sick cattle as soon as possible. Processing should not be delayed for more than 24 to 36 hours after arrival. Longer delays result in higher rates of illness and do not take full advantage of the protection offered by vaccines or preventive medications.

Body temperatures should be taken as the cattle are processed if they have been rested overnight. Body temperatures of cattle just unloaded from the truck are not reliable indicators of illness. It is important to process cattle in small groups, so no animal is out of its pen for more than 30 minutes. Process early in the morning to avoid higher environmental temperatures later in the day and to avoid artificially elevated body temperatures taken in the afternoon. An electronic thermometer is essential.

Calves with a body temperature of 104° F or greater or showing other signs of illness should be separated from the group and kept in a hospital pen where they will receive a treatment program as outlined by the veterinarian working with you. Even though body temperature can be a valuable indicator of illness, too much reliance can be placed on rectal temperature. The appearance and history of the calf should be considered in deciding whether the calf is actually ill.

It is tempting to use all available vaccines and bacterins to minimize disease. But many calves entering backgrounding or stocker operations are highly stressed and may be able to respond to only a limited number of antigens. The presence of colostrum-derived antibodies may also limit immunization against some diseases. Therefore, when outlining a vaccination program, the veterinarian must consider:

- ► risk of disease;
- ► stress level of the calves;
- ► age of calves and presence of colostral antibodies;
- ► stress induced by vaccination;
- ► efficacy of the vaccine;
- ► previous vaccination history; and
- ► the time of onset of disease after arrival.

Vaccination programs should be tailored to meet the needs of calves of various ages, stress levels and origins. The benefit of vaccination upon arrival is uncertain in some cases. Using bacterins or killed-virus vaccines to provide protective immunity when given on arrival is usually not very successful. However, it has been demonstrated that modified-live-virus (MLV) vaccines will likely provide protective immunity within days. The respiratory diseases with available effective vaccines include IBR, BVD and PI_3. Modern pasteurella (*Mannheimia*) vaccines are thought to be effective if given well in advance of stressors leading to BRD.

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