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FOR IMMEDIATE RELEASE

Understanding the BRD Complex

Knowing what contributes to BRD can help you minimize its impact on your operation

STARKVILLE, Miss. (Nov. 6, 2009) – Bovine respiratory disease (BRD) is an infectious disease complex and one of the most common causes of morbidity and mortality in stocker and feedlot operations.¹ Understanding the many factors that contribute to the BRD complex is an important step for producers to take in managing the disease. When BRD hits, a perfect storm of stress factors, virus agents and bacteria are at play in the animal's respiratory system.

"There are multiple layers of the immune system protecting the respiratory tract, and once we compromise any one of them, we have the potential for a problem," explained Daniel Scruggs, DVM, DACVP, Pfizer Animal Health veterinarian. "Compromise two or more with a mix of stress, viral infection and bacterial infection and you are starting down a difficult road."

Reducing stress

Stress factors, such as weaning and transporting, commingling and crowding, and inadequate nutrition, usually set the stage for BRD by reducing the animal's disease resistance. Scruggs noted that castration and dehorning are some of the main stressors on the immune system, so producers should do these as early as possible to minimize blood loss and allow for a faster immune system recovery. Other factors like transition to new climates, heat stress, access to water, and dust also contribute heavily to the complex.

To reduce the stress factors that contribute to BRD, Scruggs recommended weaning and vaccinating prior to shipment, minimizing commingling by buying cattle from one source, giving cattle room to spread out, minimizing dust, maximizing water availability and avoiding gastrointestinal disturbances by slowly incorporating higher concentrate feed into their diets.

"Producers should always keep in mind the number of cattle they can effectively manage and not purchase more cattle than they can look out for," Scruggs said. "Make sure you match your type, class, and risk level of cattle to the amount of available time and resources on your operation."

Managing viral agents

As these factors place stress on the immune system and stack on top of each other, the door is open for viral and bacterial agents to invade. A primary viral infection of the upper respiratory tract is often the next step in the BRD complex.

“Anything that improves bacteria’s ability to attach to respiratory mucosa, proliferate and migrate down into the lung impacts the respiratory tract and makes it susceptible to colonization with a wide variety of bacteria,” Scruggs said. “The viral agents are probably the most effective at compromising the respiratory defense mechanisms to allow bacterial BRD to flourish, but there are other factors that may be as effective.”

When examining the viral agents of the BRD complex, the main diseases to watch out for include bovine viral diarrhea (BVD), infectious bovine rhinotracheitis (IBR), bovine respiratory syncytial virus (BRSV) and parainfluenza type 3 (PI₃). Because these are often the viral agents producers vaccinate for, confirming a purchased calf’s vaccinations and working with your veterinarian to incorporate a modified-live vaccine on arrival is an important step in managing BRD. But Scruggs cautioned there are other viruses and factors that can predispose animals to BRD, so vaccination is not going to be entirely protective by itself.

Controlling bacteria

Once stress factors and viruses attack an animal, dangerous bacteria, like *Mycoplasma bovis*, *Mannheimia haemolytica*, *Pasteurella multocida* and *Histophilus somni*, are given the perfect opportunity to settle into the lower respiratory tract with little resistance from the animal’s immune system.

Each bacteria common to the BRD complex is a little different, and unfortunately it is virtually impossible to determine which organisms are affecting cattle by visual appraisal alone. Difficult to identify, *Mycoplasma bovis* is considered one of the most frequent causes of repeat treatments. *M. haemolytica* is often associated with calves that get sick quickly and is known to be the most responsible for death loss, while *P. multocida* is commonly associated with treatment failures much like *Mycoplasma bovis*. *H. somni* tends to be a problem in northern climates, but has been recognized in all cattle-producing areas, and can look like *M. haemolytica*.

“It’s important to realize that we often don’t get just one, but a combination of bacteria in a case of BRD,” added Scruggs.

In addition to minimizing stress factors and vaccinating, the use of on-arrival anti-infectives with extended therapy in higher risk cattle is a key BRD management technique. Not only does this technique allow producers to reduce the number of pulls initially, but it provides more time to pay attention to the management factors that reduce sickness in the first place. Multiple studies show that using tulathromycin on arrival provides significant improvement in morbidity, mortality and first-treatment success rates on stocker and feedlot operations.²

“With the use of anti-infectives on arrival, you can pay attention to things that make you money,” encouraged Scruggs.

Treating the complex

“There is no typical case of BRD and there is a lot of individual variation in how cattle will respond,” he added.

Despite the variability in treatment response, there are some protocols producers can follow to treat the BRD complex. The most important rule is to work with your veterinarian to develop a program that works, and stick with it. What works for one operation may not work for another and utilizing a veterinarian allows for an objective evaluation of the operation’s treatment protocol.

When selecting an anti-infective, there are a number of factors to consider.

“The presence of viruses in a BRD-infected calf can explain a lack of treatment response from an anti-infective,” explained Scruggs. “The virus often stays past the duration of the anti-infective and remains active long enough for the virus to synch up with bacteria after the antimicrobial has depleted.”

An extended-therapy anti-infective can help ensure that the product remains on board long enough to treat the bacteria and outlast the ability of the virus to match up with bacteria. The antimicrobial has no effect on the virus of course, but it can help minimize the effect of the bacterial super infection that may occur. In addition to the therapeutic length of the product, the breadth of bacterial coverage is also important. Because the BRD complex usually includes a combination of bacteria, make sure your anti-infective treats a wide range of pathogens, including *Mycoplasma bovis*, to obtain satisfactory treatment results.

“When health becomes the limiting factor in production it is probably costing you a lot more than just the medicine bill and death loss,” stated Scruggs. “Almost every producer has encountered a situation where poor health in cattle has limited their ability to buy more cattle or has limited the return they got for groups of cattle. Those lost opportunity costs are hard to quantify, but they are there, and may eclipse the medicine bill. Implementing protocols that minimize stress, manage viruses, control bacteria and effectively treat BRD are important to maintaining a producer’s bottom line.”

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¹ USDA Animal and Plant Health Inspection Service: NAHMS Beef 97 Part III: Reference of 1997 Beef Cow-Calf Production Management and Disease Control. Accessed May 2008 at www.aphis.usda.gov/vs/ceah/ncahs/nahms/beefcowcalf/beef97/bf97pt3.pdf.

² Nickell JS, et al. Comparison of short-term health and performance effects related to prophylactic administration of tulathromycin versus tilmicosin in long-hauled, highly stressed beef stocker calves. *Vet Ther.* 9(2):Summer 2008 (147-156).

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