

**Red Nose in Calves - Prevention and Control**  
**Mel Pence DVM, MS, PAS, Diplomate ABVP (beef cattle)**  
**University of Georgia, College of Veterinary Medicine**

Red nose is a disease syndrome in cattle that usually refers to an infection with a combination of Infectious Bovine Rhinotracheitis (IBR) virus and Bovine Parainfluenza (PI-3) virus. Both of these viruses are common in cattle populations and can be isolated from normal healthy cattle. When cattle are stressed and/or their immunity is low, they may develop disease related to infection of "Red Nose". Most cattle viral vaccines include both of these viruses.

IBR is a type 1 herpes virus and is in the same family of viruses that cause cold sores in humans. Although IBR virus is capable of causing pneumonia, eye lesions and reproductive problems, this article will focus solely on the respiratory form of IBR. Herpes viruses tend to remain dormant in the body until times of stress, which leads to reactivation and shedding of the virus. Consequently, there are a large number of cattle that shed the virus during weaning, when they are moved, or when there are changes in feed or water sources. The previously latent virus infection in these cattle then becomes an active infection and virus is shed to other cattle. PI-3 virus is also common in the cattle population and stress results in viral shedding to other cattle.

Neither PI-3 nor IBR are considered lethal infections but they decrease the ability of cattle to prevent other infectious agents from entering the lungs. To understand this disease process, we need to examine the disease process and understand how cattle get shipping fever or respiratory diseases. The normal barriers that prevent the development of pneumonia in cattle start with the mucus cells that line the windpipe (trachea) and nasal areas. The function of these cells is to ensure that the entire windpipe is covered with mucus. Dirt, bacteria, or other small particles stick to this mucus when they are inhaled by the cow. The trachea also has small hair-like structures (cilia) that protrude into the trachea. These cilia have a rhythmic beat or wave that occurs only in one direction (toward the throat). As a result, bacteria, viruses, and dust inhaled will stick to the mucus, the cilia transport the mucus up the trachea to the back of the mouth where it is swallowed. This system works exceptionally well until a virus infection, excessive dust, and/or bacteria and/or stress causes the system to break down. The overcrowding of cattle results in more bacteria entering the trachea. Similarly, commingling (mixing of calves from several sources) results in the exposure of the calves to different viruses and bacteria than they have encountered previously. Viruses like IBR, PI-3, and others attack and kill the cells in the trachea that produce the cilia. These viruses also irritate the trachea, causing the production of excess mucus. The initial infection with these viruses is mild causing only a mild temperature increase, cattle go off feed, and there is swelling and irritation of the muzzle (i.e., "Red Nose"). With a "Red Nose" infection, we usually see a sudden onset of a profound severe cough. With non-functioning cilia, dust, bacteria, and viruses go down the trachea and enter the lung. Once in the lung, these organisms cause respiratory disease and pneumonia. Calves with severe pneumonia must breathe hard to oxygenate their blood, and they often develop a fever of 104 - 106. Antibiotics can be used to treat the bacterial part of the pneumonia, but the cattle must develop an active immunity to stop the viral infection because viruses cannot be treated with antibiotics.

A good preconditioning program relieves the stress of shipping, starts calves on feed and increases the immunity to prevent infections that can cause these respiratory problems. **Experience and research have shown that the critical factors in preventing pneumonia in shipped calves are: 1. Weaning and starting on feed 45 or more days before shipping, 2. Use of a good modified live 4-way virus vaccine at least 3 weeks before shipping, and 3. Use of Pasteurella vaccine at least 3 week before shipping.** Prior vaccination with IBR, PI-3, BVD and BRSV reduces the possibility of pneumonia in shipped calves by preventing viral infection from disrupting the protective layer of ciliated and mucus producing cells of the trachea. The normal functioning cells of the trachea then prevent bacteria, dirt, dust, and other viruses from entering the lung. Vaccination with the appropriate vaccines at the appropriate times is a cornerstone in increasing the immune status of these cattle.