Shipping Fever and Its Prevention
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Each year millions of dollars are lost by the American beef and dairy industries to shipping fever, a debilitating disease of cattle and other large animals. Shipping fever, the layman's term for infectious broncho pneumonia, is primarily associated with cattle which have been transported from the farm to feedlots; however, the disease can strike a herd which has never left the farm.

"The organisms causing infectious broncho-pneumonia are everywhere," said Dr. Robert M. Dyer, a researcher in medicine at the Veterinary School of the University of Pennsylvania. "Cattle are constantly exposed to them. However, to have an outbreak of the disease, three factors must be present: the viral component, the bacterial component, and a stress factor."

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Dr. Dyer explained that at least 20 different viruses are associated with the disease and that eight or nine have been definitively identified as causative. In addition to viruses, bacteria play a major role in the disease process. Stress, the third major factor contributing to the susceptibility to broncho pneumonia can be transportation, overcrowding, mishandling, poor ventilation, starvation, or dehydration.

It has been found that infection due to one virus alone will cause just a mild respiratory infection in unexposed, healthy cattle. However, in animals that are stressed, the immune system is less resistant. The initial infection by one agent weakens it further and paves the way for the invasion of other organisms, causing multiple infections resulting in broncho pneumonia.

"In many outbreaks of broncho pneumonia, to find multiple infections occurring simultaneously," explained Dr. Dyer. "The morbidity may be as high as 100% in a herd with a mortality rate of up to 20%. One animal may have a viral infection. This begins the chain of events. Bacteria which are normally present in its upper airways invade the lower airways in the lung and severe disease results. The animal sheds the viruses and bacteria. and disease spreads."

Normally a large number of particles and organisms are filtered out as the animal breathes. Particles which do reach the lungs are expelled by means of the mucociliary apparatus, cells which line the trachea and the bronchioles which produce a constant mucous flow that is expelled. If these cells are damaged by infectious agents, gaseous irritants or extremes in temperature, the clearance of infectious agents may be hindered. Antibodies and cells which mediate immunity protect the upper and lower airways against infectious agents. Another protective mechanism is alveolar macrophages, cells which ingest and destroy viruses and bacteria. The whole defense mechanism is in a state of delicate balance and it takes very little to upset it. Elevated cardiotonic levels, inhaled pollutants, viral infection and a number of other factors can render the defense mechanism of the pulmonary system ineffective, leaving the animal vulnerable to broncho pneumonia.

Dr. Dyer explained that the most commonly found viruses associated with shipping fever are herpes viruses, parainfluenza viruses, bovine syncytial virus, adenoviruses, bovine rhinovirus and bovine viral diarrhea virus. Each of these produces slightly different symptoms. Some, like the cough associated with shipping fever, are shed for 10 to 20 days following infection. A number of bacterial infections occur simultaneously to or shortly after exposure to the viruses. The most common are those caused by Pasteurella organisms. Vaccines have been developed against three of the viruses and one of the bacterial agents. However, because of one virus will not be enough to combat the disease.

"Farmers obviously cannot remove the infectious agents from the environment as they are all around us," said Dr. Dyer. "But they can limit the stress factor." He explained that the nature of the feedlot cattle. A sick animal is a poor weapon against shipping fever is prevention. Farmers obviously cannot remove the infectious agents from the environment as they are all around us," said Dr. Dyer. "But they can limit the stress factor." He explained that the nature of the feedlot cattle. A sick animal is a poor weapon against shipping fever.

Frequently the ventilation in these structures is poor, resulting in very moist air and an abundance of ammonia gases, from urine and feces. High concentration of these gases have been shown to damage the air passages, making the animal more vulnerable to disease. Because calves are concentrated in an enclosed environment, broncho pneumonia once the barn, can spread like wildfire.

A major threat to the dairy farm is that broncho pneumonia can spread to the adults, causing abortions and resulting in great losses of future stock and milk production. According to Dr. Dyer, dairy calves should be housed individually in hutch to minimize the spread of infectious diseases. If they must be housed in a barn then this structure should be well ventilated and frequently cleaned to prevent the build-up of gases and infectious agents.

Dr. Dyer is currently investigating the immunologic mechanisms of the lung. He is looking at how the organ protects itself biochemically and how the cells kill bacteria. "It is basic research," he said. "Not much is known about the defense mechanism in the respiratory tract. How it functions and why it breaks down. We need to gather much more information to find a more efficient way to combat broncho pneumonia in cattle and other large animals. The traditional means of vaccines and antibiotics are not working too well. Until we find a better way of treating these animals, prevention is the key. Good animal husbandry and reduction of stress, both environmental and due to transportation, are vital to reducing the losses incurred by shipping fever."

Dr. Dyer graduated in 1975 from Penn's veterinary school. He did graduate work at the University of Michigan. Now he is a lecturer in medicine and is working on his Ph.D. His research is supported by the USDA and the Pennsylvania Department of Agriculture.