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FACT SHEET

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Pasteurella Bacteria In Cattle Pneumonia

Pasteurella bacteria are important disease producers in cattle. They are responsible for most deaths and cases of serious lung damage among cattle having severe pneumonia. All ages of cattle can be infected.

Evidence indicates pasteurella bacteria are present in the upper respiratory tract (air passages of the head and windpipe) of a small percentage of cattle not showing the disease. These few carriers are suspected to develop pasteurella pneumonia after a health stress and then cough up the bacteria, infecting others.

Experimentally, healthy, nonstressed cattle exposed only to pasteurella bacteria rarely develop the disease. And in some cases, all the rules of good husbandry and disease management are broken, yet no health problems develop.

For a specific disease to develop in a group of cattle, carrier or shedder animals (which may appear healthy) must provide the initial source of an infectious bacteria or virus. For example, IBR virus produces infectious bovine rhinotracheitis, and BVD virus produces bovine virus diarrhea.

Pasteurella pneumonia commonly occurs among cattle under these health stress conditions that seem to lower disease resistance and result in increased susceptibility:

Physical predisposing factors

Wet-cold conditions

Cold, by itself, is probably of little importance if the animal has adequate nutrition and a dry hair coat. A dry hair coat is probably very important for the health of animals acclimated to the cold winters of the northern United States.

Wet-cold conditions sometimes plague range calves born in early spring. Such conditions encourage the development of pneumonia.

During winter, pneumonia frequently occurs among dairy cattle maintained in drafty areas of the barn where cold outside air meets the warm, humid inside air. This meeting of cold and warm air frequently results in near rainlike conditions. Such an environment is commonly associated with pneumonia among these constantly wet and cold animals.

Poor ventilation

Humid, drafty, poorly ventilated dairy barns are often where serious pneumonia problems develop. The wet and cold conditions provide an environment which reduces animals' resistance to disease. Also since pasteurella bacteria are spread by contaminated air, high humidity offers greater opportunity for bacteria to travel. Well-designed ventilation systems providing draft-free, fresh, clean outside air prevent buildup of bacteria in the air.

Another threat is to veal calves raised on slats over a pit. In poorly ventilated units, an updraft of cold, humid air having high ammonia gas content keeps the calves cold (no draft-free bed under them). In addition, this air irritates the lining of the respiratory tract. Such calves are prone to pneumonia.

Traveling

Susceptibility to pneumonia is increased among calves hauled long distances confined to areas of trailers where they are forced to breathe diesel exhaust.

Other stresses

Stresses of calves due to weaning, handling, fatigue, and poor nutrition during selling and long-distance transportation probably increase susceptibility to pneumonia.

Metabolic predisposing factors

These are abnormal changes in the body associated with protein, energy, mineral, and vitamin supply and utilization.

Ketosis in dairy cattle

Dairy cows suffering an imbalance between their production and their nutritional needs frequently develop ketosis.

This condition appears to increase animals' susceptibility to pasteurella bacteria and pneumonia.

Vitamin A deficiencies

Vitamin A deficiencies increase susceptibility to respiratory disease because this vitamin is essential in maintaining normal membranes and disease resistance.

Inadequate energy and protein

Starving animals show increased disease susceptibility because their resistance decreases. Aged beef cows with poor teeth and low stamina or timid animals that don't compete for feed are highly susceptible. Young replacement heifers maintained on inadequate rations and infected with lice and internal parasites are also highly susceptible.

Predisposing contagious diseases

IBR

Infectious bovine rhinotracheitis (IBR), also known as red nose, can produce initial changes in the respiratory tract to increase susceptibility to pasteurella bacteria.

In a few herds (primarily dairy herds and range beef cows with few introductions of outside stock), IBR exists in its pure form because no pasteurella bacteria are present to concurrently infect animals having IBR.

Animals infected with both IBR and pasteurella bacteria become very sick; death losses may be extremely high.

BVD

Bovine Virus Diarrhea (BVD) infections may make animals highly susceptible to pasteurella pneumonia. This is because BVD damages the respiratory tract and suppresses the immune system. Animals infected with both BVD and pasteurella bacteria are very sick, and serious death losses can be expected.

PI3

Parainfluenza 3 Infection (PI3) is a very common virus disease of cattle. It's no more serious than humans' common cold. PI3 infections, however, can increase cattle's susceptibility to pasteurella pneumonia.

Other virus infections

Other less widely recognized respiratory virus infections exist (adenoviruses, rhinoviruses, and enteroviruses). Their importance in increasing susceptibility to pasteurella infections is unknown.

Shipping fever complex

Respiratory disease that occurs in recently weaned, sorted, hauled, and tired feeder calves shortly after they have arrived at the feedlot is frequently called shipping fever.

This complex illness often involves more than one disease-producing bacteria or virus. It is difficult to assess the importance of individual common virus respiratory diseases (PI3, IBR, BVD) in shipping fever; all or none of them may be involved. One common factor is the presence of pasteurella bacteria and the serious lung damage it causes. This acute and serious lung damage is often the primary cause of death.

Parasite diseases

Internal and external bloodsucking parasites (worms and lice)

Both young and aged animals receiving inadequate nutrition are frequently less able to withstand bloodsucking parasite infestations. This combination of inadequate nutrition and heavy parasite infestation increases susceptibility to pasteurella pneumonia. Pneumonia is frequently the final blow, resulting in death for these weakened cattle.

Summary of predisposing factors to pasteurella pneumonia

Pasteurella bacteria (which are frequently present) seem to be opportunists that often become important infectious agents whenever cattle's disease defenses are reduced. Pasteurella pneumonia is often the primary cause of death from severe lung damage.

Clinical signs

Signs of pasteurella pneumonia may vary.

In general, these signs indicate pneumonia:

- Body temperature as high as 108°F.
- Increased rate of respiration; coughing, runny nose, and generally slow-moving and depressed. (Pleuresy is frequently involved; this is a painful condition).
- May show a dry, crusted muzzle.
- In a few cases, when serious lung damage has occurred, air accumulates under the surface of the skin over the back.
- Usually has very little appetite for feed—does not come to feed bunks with rest of herd.

Spread

Pasteurella bacteria exist in a small percentage of cattle that don't develop the clinical disease. These carriers among a group of stressed cattle can develop a serious infection and then shed pasteurella when they cough and aerosolize their respiratory secretions. Health stressed, closely confined animals become infected when they are exposed to air containing high concentrations of pasteurella. In turn, they provide an additional source of pasteurella, so eventually most of the herd is infected.

Diagnosis

Diagnosis is based on clinical signs, disease patterns in the herd, response to treatment, isolation of pasteurella bacteria, and determination of lung damage.

Treatment

Pasteurella pneumonia generally responds to many kinds of antibiotics. However since initial factors are quite variable, judgements must be made on an individual basis. Response to treatment is not always predictable.

Death losses are reduced through correct diagnosis and early intensive treatment maintained for at least 3 to 5 days. In some cases, animals respond well to treatment in 12 to 24 hours. The animals may not be cured, however, and if treatment is discontinued, a serious relapse may occur. And treatment after a relapse is much more difficult. Early treatment is important because serious irreparable lung damage occurs very early in pasteurella infections. Stopping this process early reduces the chances of acute early death as well as chronic lung disease and abscessation which render an animal an unprofitable converter of feed to meat or milk.

Prevention

Since pasteurella pneumonia problems are often related to other health difficulties, prevention includes measures which will reduce health stresses. Prevention should include efforts to handle the cattle carefully, to provide good ventilation systems for housed cattle as well as sound nutrition, rest for cattle in transit, parasite control, and early vaccination for predisposing virus diseases.

Pasteurella vaccines are available and are widely used. Their benefits are questionable, and duration of immunity is for only a few months at best (recovery from pneumonia doesn't result in more than a few months' immunity).

Veterinarians frequently prescribe preventive drugs to groups of highly susceptible cattle (for example, feeders entering a feedlot). Many veterinarians believe this is a reasonably effective means to reduce the severity of a probable outbreak of shipping fever.

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