

## ***Pasteurellosis (shipping fever)***

**Synonym:** in cattle: shipping fever, bovine pneumonic pasteurellosis.

In sheep and goat: ovine and caprine bacterial pneumonia.

### ***Definition:***

BOVINE shipping fever is an infectious respiratory disease. It is somewhat comparable clinically to influenza in man, but it has a longer incubation period and is primarily a disease of the lungs. This disease can affect cattle of any age, breed, or sex, occurs primarily in young cattle between the ages of 6 and 18 months. Characteristically, the disorder follows a stressful event

### ***Etiology:***

***Pasteurella haemolytica***. Small Gram-negative rods, cause fibrinous pneumonia in cattle, in sheep cause Septicemia (lambs under 3 months of age); pneumonia; and gangrenous mastitis.

### ***Predisposing factors:***

- Stressful events are numerous and include weaning, transportation (e.g., shipping, mixing with infected animals in sales), occurring 2-14 days later.
- Sheep infected with pneumonia when a flock of sheep is exposed to bad weather shortly after shearing).
- Sudden changes in climatic conditions (e.g., temperature, humidity), inadequate or irregular feeding, water deprivation, crowding, dehorning, castration, and vaccination.
- Respiratory viral infection can be a factor, is responsible for the broadest spectrum of opportunistic infections.

### ***Clinical signs \ clinical findings:***

1) Affected **cattle** are depressed, usually anorexic, and have rapid shallow respirations with a weak, productive cough. Early signs of the depression may be simply a failure to stretch freely when encouraged to rise. Fever is often as high as 41°C.

In the early stages of the disease, lung sounds only consist of increased breath sounds. In the advanced stages, crackles and wheezes become readily audible, and there may be pleural friction rubs in some animals. A mucopurulent nasal discharge, crusty nose, and ocular discharge may appear, along with emaciated appearance to the abdomen after several days of not eating.

## 2) in sheep;

Clinical disease is usually most severe in young lambs and kids (a) If detected early, affected lambs or kids appear dull and become powerless before death in a matter of hours. Sick animals are often unobserved until the final stages of the disease.

(b) In the older animals, signs of respiratory disease are observed, with dyspnea, slight frothing at the mouth, cough, and nasal discharge. These signs are brought out when the herd or flock is moved and affected animals fall behind the rest. Fever (greater than 40.5°C), depression, and anorexia also accompany these signs.

### **Pathogenesis:**

*P. haemolytica* are normal inhabitants of the bovine and ovine upper respiratory tract. With the stressors, these organisms are able to colonize and proliferate in the lower respiratory tract which cause invasion of lung. *P. haemolytica* has four virulence factors that interact to produce disease: fimbriae, polysaccharide capsule, endotoxin, and leukotoxin.

(i) The bacterial fimbriae enhance the colonization and proliferation of bacteria in the upper respiratory tract.

(ii) The polysaccharide capsule inhibits phagocytosis and intracellular killing of the organism.

(iii) Endotoxin is directly toxic to the bovine endothelium and it can alter bovine leukocyte functions.

(iv) Leukotoxin is a species-specific cytotoxin against ruminant leukocytes and platelets, acting as cytolysin.

### **Transmission:**

Animals either have the bacterial organisms in their nasopharynx or become infected by aerosol from other animals. However, the disease does not appear to be contagious in the way it affects the individual.

### **Necropsy findings:**

In outbreaks, there will likely be some mortalities (1-10%) on which necropsy can be performed. Changes include :

- marked consolidation of the cranial and middle lobes with a distinct demarcation between affected and unaffected lungs.
- Extensive fibrinous pleuritis (pleura is covered with fibrine), pericarditis, and in more chronic cases, abscess formation in the lung, also may be present. The organism can

usually be isolated in large numbers from tonsils, lung, liver, and the ulcerated areas of the intestinal tract. In case of septicemia the lambs die without any specific clinical signs.

### **Diagnosis:**

- 1) Clinical findings with a stressful event are usually sufficient for a tentative diagnosis.
- (2) Laboratory analysis is not often necessary with individual cases and is not diagnostic for shipping fever.
  - (a) Blood work. Predictably, there is a Leukocytosis on the CBC, but there also can be leukopenia if endotoxemia is a major component.
  - (b) A transtracheal aspirate yields septic, degenerate tracheal exudate containing gram-negative rods and often, If nasopharyngeal swabs are taken, *P. haemolytica* can be cultured.

### **Differential diagnosis:**

Cattle with pneumonia or with leptospirosis, anthrax, blackleg, certain intoxications, or even a mild digestive disorder may sometimes show similar symptoms before other symptoms more characteristic of those diseases develop. In all except the respiratory diseases, however, the characteristic coughing is usually absent.

### **Treatment\ therapeutic plan**

1- Procaine penicillin G, 22,000 IU/kg, IM or SC q 24 h for 3 to 5 days .

W/P(withdrawal period): meat 14 days and milk 3 days .

**or**

2- Oxytetracycline hydrochloride 11 mg/kg, SC q 24h for 3 days; long acting (LA )formulations, 20 mg/kg, IM, q 48 h continued for at least 2 days after the rectal temperature has returned to the normal range. W/P: meat 16 days; milk 84 hours

**or**

3-Sulfadimethoxine

*Initial dose:* 60 mg/kg; *maintenance dose:* 30 mg/kg, IM, q 24 h for 3-4 days.

w/p: milk 5 days.Precautions: maintain an adequate water intake

(Ampicillin, ceftiofur, danofloxacin, enrofloxacin, florfenicol, trimethoprim-sulfamethoxazole, and tulathromycin would be expected to have good efficacy),

(3)(flunixin meglumine 1.1mg\kg of BW). This drug is in the class we refer to as non-steroidal anti-inflammatory drugs (NSAIDS),helps the animal recover by controlling the inflammatory

process (including fever) that occurs with these infections. This is similar to the way aspirin or Tylenol works when you have a respiratory infection. The drug is labeled for intravenous (IV) injection and must be given slowly to avoid adverse reactions. The withdrawal time for meat is 4 days after the last treatment.

4) IV fluid and electrolytes in weak stressed animals.

### **Prognosis**

Delayed or irregular treatment, inappropriate dose of therapy in some cattle can result in increased mortality. Cattle with more than 50%-60% pulmonary consolidation generally respond poorly and frequently relapse. Sick cattle should receive adequate shelter and good nutrition, particularly when the management system in place encourages crowding and competition for feed and water space.

### ***Control and prevention:***

1) **Management improving:** decrease the stressful events such as weaning **calves** immediate with castration, dehorning, and vaccination. By performing some of these procedures at a separate time should occur 3 weeks to 1 month before shipping.

During shearing, young **sheep** should be shorn first, and clippers blades sterilized to reduce the risk secondary infection. Additionally, avoid dipping or spraying for external parasites if there is any sign of cold wet weather. Avoid pregnant and lambs overcrowding.

2) **Vaccination** against shipping fever for respiratory pathogens should be completed at least 3 weeks before transportation. Also, there has been evidence that vaccination with live products at the time of stress may increase morbidity or mortality.

(3) **Chemoprophylaxis.** Another tact taken to reduce the morbidity and mortality of shipping fever is the administration of antibiotics at the time of stresses ,Drugs used include long-acting oxytetracycline ( 20 mg\kg) or tilmicosin (micotil, 10 mg\kg subcutaneously).