

Bacterial Pneumonia in Goats

Introduction

Pneumonia is one of the most common respiratory problems in small ruminants throughout the world. In goat herds, pneumonia increases production costs associated with expensive treatments. Although pneumonia often occurs in kids, illness and deaths also occur in adult animals.

Pneumonia occurs when infectious and non-infectious agents cause the lungs of goats to become inflamed. The most frequent causes of respiratory infection and death are *Pasteurella multocida* or *Mannheimia haemolytica* (previously called *Pasteurella haemolytica*). *P. multocida* and *M. haemolytica* are commonly found in the upper respiratory tract of healthy goats. *M. haemolytica* are subdivided in two groups, A and T. Type A is most prevalent and is associated with a severe form of pneumonia. Goats that survive an acute stage may recover or become chronically infected with reduced lung capacity. Pneumonia caused by *P. multocida* and *M. haemolytica* can lead to significantly decreased growth performance. These two pathogens (agents that cause disease) cause outbreaks of acute pneumonia in goats of all ages. Respiratory infections from these pathogens are associated with poor

management practices, occur as a secondary infection, or occur as a consequence of severe stress. Transportation stress, viral infections (e.g., parainfluenza-3 virus), lung parasites, prior bacterial infections, overcrowded pens, poor housing conditions, sudden environmental changes, and other stressful conditions increase goats' susceptibility to *P. multocida* and *M. haemolytica* pneumonias.

Bacterial, viral, and parasitic infections break down tissue defense barriers. Loss of this natural protection increases a goat's susceptibility to secondary infection by *P. multocida* and *M. haemolytica*. Animals whose lungs are already weakened from previous diseases will suffer from leukotoxins and lipopolysaccharides, both potent toxins

that, in high levels, promote inflammation and severe lung damage. In kids, acute outbreaks can occur with low morbidity rates but high mortality rates. Typically, several kids that appear healthy die suddenly. Signs of the disease may not be noticed until later, after several animals have died.

Optimal conditions for pneumonia caused by *P. multocida* and *M. haemolytica* include the following:

- Viral diseases
- Sudden environmental changes
- High air humidity
- Poor hygiene and barn ventilation
- Severe internal parasites (worms and coccidia)
- CL (caseous lymphadenitis) infections



Goat with nasal mucopurulent discharge

- Poor nutritional management, undernourishment, or sudden change in diet
- Transportation stress
- Crowded pens with poor ventilation can cause outbreaks.

Signs of Pneumonia

- Fever with temperature of 104 degrees F (40 degrees C) to 106 degrees F (41 degrees C)
- Moist, painful cough, dyspnea (difficulty in breathing). Examination of the lungs may reveal cracklelike sounds, along with nasal and ocular mucopurulent discharge
- Anorexia (loss of appetite)
- Depression

Diagnosis

Diagnosis is based on clinical signs and herd history. Dead animals can be used for a definitive diagnosis. Isolation and culture of the bacteria harvested from a tracheal wash and from pulmonary secretions can be used to isolate and identify the causal agent. A necropsy of lobes

from the lungs will show hemorrhagic (bloody) secretion, and possibly pus and dead tissue lesions. Diagnostic labs also use the polynucleotide chain reaction (PCR) technique, which can be costly, and immunohistochemical techniques. These analyses are valuable in identifying causal agents and determining treatment and preventive methods. Consult a veterinarian for diagnosis of small ruminant pneumonia. The veterinarian can also assist in the necropsy and in sending samples to a diagnostic laboratory for further analysis.

Treatment

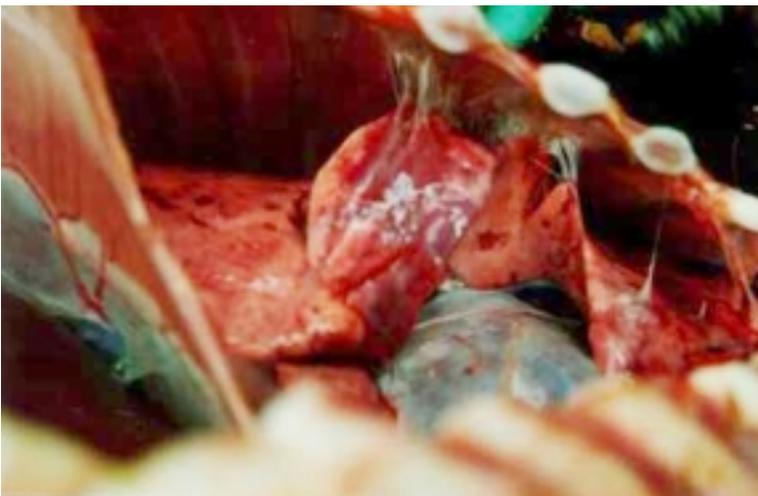
Medicines effective in treating pneumonia in goats include penicillin, ampicillin, tetracycline, oxytetracycline, tylosin, florfenicol, and ceftiofur. Ceftiofur is the only antibiotic approved by the Food and Drug Administration (FDA) to treat caprine pneumonia. The daily dosage is 0.5 to 1.0 mg/lb body weight injected intramuscularly for three days. Consult the manufacturer's guide for complete product

usage and storage instructions. Probiotics are recommended after antibiotics to promote regrowth of the normal rumen microflora (bacteria and protozoa populations).

With the exception of ceftiofur, the FDA has not approved the antibiotics discussed for treating goats. Their use is considered extra-label, requiring consultation with a veterinarian for product usage and guidance.

Prevention

- Vaccinate the herd, a systematic vaccination of the entire herd is advised. The FDA has approved a *P. multocida* - *M. hemolyticum* vaccine for use in goats from the Colorado Serum Company. The product label provides recommendations for vaccinating goat kids up to six months of age. For complete product usage and storage consult the manufacturer's guide. This vaccine may cause temporary limping in a few goats.
- Improve management practices by providing optimal sanitation and air quality in housing.
- Minimize transportation stress.
- Quarantine new animals before introducing them into the existing herd.
- Administer trace minerals, such as Cu, Se, and Zn, to enhance immune function. Adding vitamin E to receiving diets at pharmacological levels (e.g., > 1,000 IU/animal daily) also seems to be beneficial.
- Provide good quality hay and water, and supplement as appropriate.



A necropsy of lobes from the lungs will show hemorrhagic (bloody) secretion, and possibly pus and dead tissue lesions.

- Consult a veterinarian to prescribe and administer a decongestant and anti-histaminic drugs to reduce lung congestion.
- Keep sick goats in a dry, well-ventilated location away from the rest of the herd.



Goat with nasal mucopurulent discharge

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UNP-91

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New March 2007; UNP-91