

ACUTE PULMONARY EMPHYSEMA OF ADULT CATTLE



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What is Acute Bovine Pulmonary Emphysema?

The name ACUTE BOVINE PULMONARY EMPHYSEMA (abbreviated ABPE in this circular) describes a severe disease affecting the lungs of cattle. **ABPE affects primarily adult cattle following a sudden change in diet and it is not an infectious or contagious disease.** Most outbreaks are usually preceded by one of the following conditions: a change from dry/mature feed to lush/succulent, immature green feed; a change from a grass pasture to a legume pasture; a change from a good quality grazed pasture to one with ungrazed new growth; consumption of tender plant regrowth following a frost; and, occasionally, a change from one field to another with no apparent differences between the two.

ABPE usually occurs during late summer and fall, but severe outbreaks have been reported to occur in the spring.

Regardless of the nature of dietary changes, ABPE occurs within a week to 10 days following these changes, and some cases may occur as early as 24 hours following the change in diet.

It appears that several things happen when the sudden change from dry to lush forage is made. When cattle are moved in this manner, they often are exceptionally hungry and, over a period of two or three days, they eat large quantities of lush new forage which markedly increases rumen fermentation. These factors favor formation of toxic quantities of 3MI, which are absorbed into the blood and carried to the lungs where considerable tissue damage occurs. An understanding of this mechanism makes it possible to take steps that might reduce incidence of the disease when changes in forage are made.

A consistent feature of ABPE is its incidence in almost only adult cattle. Rarely, if ever, is it observed in cattle less than two years old.

Outbreaks of acute respiratory distress may indeed affect cattle two years old or younger, but these are seldom diet-related. Factors such as migrating parasites, moldy feedstuffs and viral infections should be suspected in these instances. The bovine respiratory syncytial virus (BRSV) is known to cause outbreaks of acute respiratory disease, especially in growing cattle.

What Causes ABPE?

Recent experimental work has provided useful information regarding the mechanisms of this disease. It was demonstrated that ABPE is caused when tryptophan (an essential amino acid) and indoleacetic acid (a "plant hormone" derived from tryptophan) are converted by rumen bacteria to a toxic product known as 3 methylindole (3MI) which affects the lung tissues. Further, it appears that conversion of tryptophan and indoleacetic acid to 3MI is accelerated when rumen fermentation is increased.

What are the Symptoms of ABPE?

The signs of ABPE are characterized by their sudden onset and usually are observed within 7-10 days following dietary changes. Affected animals exhibit great difficulty in breathing and stand with their neck stretched (so that both head and neck are parallel to the ground). Respiration rate is rapid, with long inspiration and abrupt expiration, accompanied by monotonous groans at expiration. The nostrils are dilated, the mouth is open, and the tongue often protrudes. There are occasional bouts of coughing and

foam may come out from the nostrils. An admixture of blood in the foam coughed is normally an indication of imminent death.

Often animals are just found dead in the pasture with traces of foam, sometimes bloodstained, on nose and mouth.

What Can Be Done To Prevent ABPE?

Prevention and control of ABPE is based on avoiding circumstances under which the disease is known to occur. Before moving cattle from a dry, mature feed to a lush, succulent pasture, place them in a dry lot and feed sufficient prairie or alfalfa hay and a palatable salt-mineral-grain supplement. Another alternative would be to place cattle in fields containing grain stubble, mature pasture forages or heavily grazed pastures and supplement them with hay prior to finally placing them in a lush pasture.

If there is no alternative but to place them in a lush pasture, it is essential to make an easy transition by feeding them some hay or straw and gradually getting them accustomed to the lush forage.

Many cattlemen will scatter bales of hay throughout a lush pasture, or will cut and windrow some of the forage. In some instances it may be prudent to use the lush forage with young stock rather than mature cattle.

Researchers have demonstrated that ionophors (e.g.: RUMENSIN or BOVATEC) tend to reduce the formation of 3MI by rumen fermentation. Ionophors could be helpful in controlling ABPE.

What is the Treatment of ABPE?

There are no specific medications to treat ABPE or inactivate the toxic 3MI. In addition, restraining sick animals may be hazardous since they already have great difficulty in breathing and may suddenly die from any type of exertion. A rule of thumb in treating cases of ABPE is: If you can help it, avoid treatment; if you have to treat, avoid excitement. The cardinal rule is **not to excite cattle affected by ABPE**.

A change in feed and complete rest is perhaps the most effective way to handle ABPE outbreaks.

Certain drugs may be used with relative success, provided they are carefully administered to the sick animals. Antihistamines (reduce spasms), corticosteroids (have anti-inflammatory action), and atropine sulfate (relieves congestion and facilitates movement of air throughout lungs) can be used as symptomatic treatment for ABPE. Large doses (2 grams) of atropine sulfate have proven helpful. Once the clinical signs of ABPE subside, it may be convenient to give the animal either antibiotics or sulfas to minimize the risk of secondary bacterial pneumonia.