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G 77-327

Acute Bovine Pulmonary Emphysema

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This disease has been recognized for many years and under many different names including "Pulmonary Adenomatosiis", "Panters", "Lungers", "Bovine Asthma", "Fog Fever", and "Atypical Interstitial Pneumonia".

It is characterized by sudden onset of acute respiratory distress with the affected animals producing an audible grunting noise when they exhale. Most commonly ABPE occurs about 4 to 14 days following a change in pasture from a closely grazed area to one where there is more lush growth.

Theories of Causes

ABPE has been studied for several years by researchers. Numerous theories of the cause have been proposed but none have been proven.

Because the disease occurs following a change in diet, the character of the feed consumed or digestive processes peculiar of cattle has been the target of most investigations.

Almost all outbreaks are confined to a sudden change from less appetizing to a more appetizing feed. The usual outbreak is preceded by one of the following conditions: 1) A change from dry mature feed to lush succulent, immature green feed; 2) A change from grass pasture to legume pasture; 3) A change from good quality pasture that has been grazed to the same type of pasture with ungrazed new growth; 4) Consumption of tender plant regrowth following a frost; 5) Occasionally a change from one field to another with no recognized differences between the two fields. Judging from these conditions it is obvious that ABPE has a dietary origin.

Since ABPE is principally a cattle disease and is nearly always associated with feed change, the cause may be some substance derived from the feed which is either peculiar to the digestive system of cattle and may be toxic to cattle. Until the exact cause is pin-

pointed it will be impossible to make specific recommendations for its control.

Occurrence

Beef and dairy cattle are equally susceptible and the disease is mostly in adults, particularly cows which have recently calved. It can occur in yearlings but only rarely in calves. In cattle two years old or older the incidence is greater in cows than in bulls. However, in younger age groups the incidence is greater in males than females and the male animals are mostly castrates.

The rate of ABPE occurrence by cattle breed is not known. There is probably little or no breed resistance or susceptibility to the disease.

No figures are available to precisely measure the seasonal variation in the occurrence of ABPE. However, the peak months of occurrence seem to be August, September and October. This is at the time summer pastures have dried out and have been grazed and changes are made taking cattle to more lush pasture or to stalk fields, or other fields which have been harvested where there may be areas of green forage along ditches or fence rows that are not particularly typical of the overall content of the pasture.

Clinical Findings

The onset is sudden. Labored breathing, often with grunting, mouth breathing and frothing at the mouth are the most obvious signs. Although the animal shows anxiety there is no apparent toxic condition and moderately affected animals will attempt to eat and drink. There may be some frothy nasal discharge and infrequent coughing. The temperature is usually about 103° F. but varies from 101° to 106° F.

Due to the forced expiration, there may be an accumulation of air beneath the skin over the rib and brisket areas. Death may occur in as short a time as

12 hours but many fatal cases survive until the second or third day. The average mortality rate is about 30% and those which survive often have chronic emphysema and are unthrifty. A chronic form may occur which is more slow in onset and the animal may be affected three or four days before being sufficiently sick for the fact to be recognized. There is an increase in the rate and depth of respiration with frequent deep coughing and a fall in milk yield and a loss of weight.

Complete recovery occurs rarely. Death may not occur for weeks or months and there may be periods of partial recovery during this time period. Most affected animals that are chronically involved are disposed of because of poor condition.

Post-mortem Findings

The lungs are enlarged and firm and do not collapse upon cutting. In the early, acute stages they contain much fluid which is thicker than usual edema fluid. In very acute cases the entire lungs are affected in this way. Such cases have edema of the larynx. The lung has a marbled appearance and may resemble a mosaic tile pattern. There is usually a frothy exudate in the bronchi and trachea. The mucosa of these passages is congested with blood.

Histologically, there is an absence of inflammation except in the case of secondary bacterial invasion. A coagulated fluid in the alveoli may be subsequently drawn out into a hyaline membrane. This is more apparent in acute cases and if animals live for a few days there is evidence of thickening of the alveolar walls. In long standing cases there is extensive scar tissue. A hyaline degeneration of the wall of the small pulmonary arteries is a common finding and is considered to be typical of the disease.

Treatment

Treatment must be initiated immediately in the acute cases but must be done without exciting the animal for any exertion may prove fatal. Affected animals should be removed from the herd to protect them from any jostling or being pushed around by the other cattle. Grazing cattle should be removed from the pasture immediately and if necessary a small portable corral could be used to pen the animals separately.

Atropine sulfate administered intravenously in doses of 2 grams may give quick temporary relief. Atropine causes a relaxation of the muscular coat of the bronchi and produces a dilating affect allowing easier passage of air. The secretions of the nose and throat

or bronchi are diminished thus lessening the amount of fluid in the respiratory tract.

Atropine may be repeated at 8 to 12 hour intervals depending upon the response. Antihistamines and cortisone have been used extensively with varying results.

Prevention and Control

With acute bovine pulmonary emphysema, like other animal diseases without clearly identified causes, the only control measures known are those based on avoiding the circumstances under which the disease is known to occur. The following management and feeding practices may reduce the chance that ABPE will occur:

1) Avoid moving cattle, particularly lactating cows, from dry mature feed to succulent immature green feed.

2) Cattle placed on a more succulent pasture or during the first few days on the new pasture should be fed some palatable grass or legume hay. Cattle placed in fields containing grain stubble, mature pasture forages and pastures that have been heavily grazed may contain patches of young green grasses or legumes that can cause ABPE.

3) Introduce cattle gradually on pastures that contain young green forages. Particularly dangerous is regrowth following a frost or new growth hidden beneath mature plants. Limit access to such a pasture to less than one hour the first day and gradually increase the time taking at least one week to reach unrestricted use. If this practice is impractical or cases of ABPE still occur, mow and windrow the field. If all these practices fail in a particular field one may have to further limit its use for grazing.

4) If an outbreak of ABPE has occurred gently remove all the cattle from that field and place the visibly affected ones in drylot and the remainder of the herd in a field of grain stubble or corn stalks or dry mature grasses. Avoid exciting the cattle. If excited, the afflicted ones may suddenly die and additional cattle may begin to show symptoms.

5) Certain drugs are useful in treating afflicted cattle. Atropine appears to be the most effective. Consult your veterinarian.

6) There are no known vaccines that will immunize cattle against ABPE. Since the agent causing the disease has not been determined it is difficult to accurately prescribe a remedy.

Because several different diseases may cause sudden death, often before any animals are observed to be sick, it is advisable to have dead animals posted to establish a diagnosis.

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