

Clinical Aspects of Pulmonary Adenomatosis

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For over 15 years I have seen an ever increasing problem with a unique acute respiratory disease in weaned calves.

The disease problem usually occurs as a sweeping outbreak with high mortality. For years we didn't differentiate it from other respiratory disease and treatment results were often discouraging.

The University of Nebraska North Platte Station Veterinary Science Department worked with us on a number of outbreaks. Dr. Gene White was field research and extension veterinarian and Dr. Clair Hibbs was the pathologist at the North Platte Station Lab.

The condition was diagnosed as Pulmonary Adenomatosis also referred to as Acute Bovine Pulmonary Emphysema, Atypical Interstitial Pneumonia, Acute Alveolar Emphysema and Edema, among others.

We have noticed several common factors with the outbreaks. They are climatology, nutrition, some breed predilection, good quality calves, exposure to previously affected herds, and no recurrence of outbreaks.

Most of the severe outbreaks occur in the colder early winter months. In my area many herds break right after the first severe cold spell.

The involved herds are good quality calves on a high nutrition level. The feeds involved vary from corn silage to high energy pellets and grain with hay or alfalfa.

As with most emphysema conditions there appears to be a breed predilection. The red breeds seem to be most susceptible, however we see the condition in all breeds.

Weaning time or vaccination history do not seem to be factors. Exposure to a herd having a history of the disease problem has been quite common in my experience. The exposure has come from summer pasture fence line contact or by herd additions. The additions have been cows or comingling of weaned calves.

The disease does not tend to recur in a pen of calves once it has gone through them. We have had different groups or pens break at different times on a ranch however.

Dr. Merwyn Frey of the Univ. Nebr. Vet. Science Dept. isolated the Bovine Respiratory Syncytial Virus (BRSV) from a number of outbreaks in my practice in 1978. Using acute and convalescent blood samples on these same calves we also saw a seroconversion for the BRSV.

The symptoms we see in the typical winter outbreaks are:
Early Symptoms:

1. Feed left in bunk-total feed consumption drops.
2. The most common early symptoms is an isolated calf that holds his head low. He will brighten up when

disturbed and may be hard to detect in the herd.

3. Mucoïd nasal discharge.
4. Salivation.
5. Watery eyes in many herds.
6. Cough level increases markedly, up to 90% in 1-2 days, a dry hack cough.
7. Accelerated respiratory rate.
8. Temp. in mildly effected calves 104°-108°.
9. Very little depression.
10. Affected calves gaunt out quickly.
11. Some calves enter the feed row and then back out and stand with their head low.

The calves with these early symptoms may be terminal and unresponsive if left untreated in 12-18 hours or less.

Later symptoms:

1. More difficult respiration:
Mouth breathing
Frothing
Severely effected calves cannot be moved.
2. Stumbly loose jointed walk
3. Severely gaunted
4. Cough level severe in the herd.
5. Calves stand around water tank but don't swallow.
Without interruption the outbreak may continue 10-14 days with high mortality.

A few ranches have experienced a summer or early fall problem with sucking calves. These calves have a milky to purulent nasal discharge, dropped floppy ear, ocular discharge (watery to purulent), high temperature (104° F-108° F), some become dyspneic when moved very far. These ranches commonly find a few dead calves at the onset. Necropsy will usually show pneumonia grossly, but emphysema can occasionally be seen. The outbreaks at this time are not quite as sudden and some symptoms differ from the winter breaks.

These summer breaks have responded well to intranasal IBR-PI3 vaccination with treatments required dropping markedly after 24-48 hours.

We have isolated the BRSV from these calves as well as seeing a seroconversion to BRSV on paired acute and convalescent sera.

Many of the late summer and fall outbreaks occur in creep fed calves.

Adenomatosis calves as seen in the winter differ from most other bovine respiratory disease in several ways:

No floppy, draining ears
No purulent nasal discharge early
Sudden onset with high morbidity
Poor response to routine treatments
Breed predisposition
Not as toxic and depressed

Necropsy

Must be careful as *Pasteurella Pneumonia* always follows the initial break.

The treatments we have evolved are rather unorthodox. We discuss this condition with our clients and impress on them the need to start early in the outbreak.

1. Fast the involved pen of calves for 2 days. Feed just enough hay to assist sorting sick calves.

In my opinion the fast is very important.

2. Antihistamines and Dexamethasone for 2 days.
10cc Pyrilamine twice daily for 2 days.
10 mg. Dexamethasone once daily for 2 days.
3. Antibiotics of choice injected on second or third day if outbreak is detected early and calves are pulled promptly. Antibiotics are given on the first day if the outbreak is going strong or for calves not detected in the early stage.
4. Sustained release oral sulfas are given on second or third day.
5. The severely dyspneic calves are pumped with water, electrolytes, and rumen booster after a couple days if they are not able to drink.

Herd treatments are vital to control the secondary pasteurellosis that usually always follows.

The involved pen of calves are given 1500-1750 mg of chlortetracycline daily on the feed for 4-5 days if the outbreak is detected early and the calves are past their fast.

The calves are given chlortetracycline in the drinking water if the treatment can't be delayed until after the fast.

We have used a limited amount of an experimental syncytial vaccine for 2 years with encouraging results. This winter we are conducting an extensive BRSV vaccine trial. We are using herds that have had outbreaks of pulmonary adenomatosis for the last one to five years. At this writing we have experienced the disease in a number of our test herds

and the morbidity and mortality looks very favorable.

Discussion:

Pulmonary Adenomatosis or Acute Pulmonary Emphysema as we see it in calves is a complex disease. The factors involved include cold weather induced pulmonary hypertension, nutritional induced histamines, pulmonary edema, breed predisposition, and the Bovine Respiratory Syncytial Virus.

Previous vaccinations or disease problems seem to be of little significance (other than the experimental BRSV vaccination).

The epidemiology indicates the disease is contagious. Most outbreaks on the ranch can be traced back to a summer exposure or to herd additions. The disease does not tend to recur in the involved calves.

The Bovine Respiratory Syncytial Virus must be widespread in the United States. One survey of blood samples from 8 brucellosis laboratories across the U.S. showed an 85% positive titre to BRSV. This is similar to the percentage positive to IBR.

We have drawn numerous blood samples from calves at various ages to determine antibody levels from colostrum and disease exposure. Dr. Frey will discuss these results. We do see that the colostrum antibody level is quite high at branding time and could interfere with vaccine response. However, it drops in August and September so that vaccination preweaning could be feasible.

Early diagnosis is vital to control the outbreak and have successful treatment response. The calves should be fasted for 2 days.

Secondary bacterial pneumonia is common and will complicate diagnosis and treatment. The BRSV damage to the mucociliary blanket is dramatic and will predispose the calf to secondary pneumonia.

These outbreaks tend to recur year after year in most affected herd.

Following an outbreak where the calves were treated promptly as I described, we have had very little after effect. We see very few chronic cases if we control pasteurellosis properly.

