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Infectious Rhinotracheitis

as it Appears

In A Feeding Area

R. B. Coffman, D.V.M.

The increased incidence of infectious rhinotracheitis, red nose or rhinitis is rapidly becoming a condition of major concern to the practicing veterinarian in a feeding area. It is primarily a respiratory infection involving the nasal passages, the larynx, and the trachea, with occasional extension into the bronchi. It was first observed to veterinarians in this northeast Nebraska area in the early 1950’s. At that time the disease had not been identified and was considered to be an influenza-like condition which, due to the dusty yards, later developed into a diphtheria-pneumonia-like condition. In the fall of 1954 the incidence of this condition increased and its onset became more explosive, resulting in much more loss of gain and, in some instances, loss of cattle.

This paper includes the observations of this condition in an area that markets several hundred thousand fat cattle per year and is considered to be the beef center of Nebraska and the United States. This includes an area of some fifteen miles radius of Wisner, Nebraska, in the Elkhorn Valley in northeast Nebraska. The highest incidence of the disease is in those operations that have more than 500 cattle on feed; however, it does occur, usually with less severity, in the smaller operations. The majority of these cattle are confined in a series of yards holding from one hundred to three hundred feeders. Some of these yards are arranged so that the cattle drink from a tank common to two yards but the later trend is more toward individual tanks for each yard. In several instances, where two yards were drinking from a common tank, it was surprising to note that the disease would be quite severe in one yard and the other would escape infection.

SEASONAL OCCURRENCE

In the earlier years of observing this disease it appeared that it was definitely a seasonal condition occurring primarily in the late summer or early fall and into the winter; however, after the outbreaks of the last three years it appears that it is not altogether seasonal. We have observed that the infection is more severe
if it occurs when the yards are dry and dusty. This atmosphere has been quite prevalent the last three years from August to January. Another factor that may contribute to the increased incidence during this period is the fact that at this time the yards are usually filled to capacity and overcrowded in some cases.

**INCUBATION PERIOD**

The earliest recognition of the disease, to our knowledge, was among the large dairies in California, where it was first recognized as an acute upper respiratory infection of dairy cows. This was in the concentrated dairy area comprising the Los Angeles milkshed. Roberts and Moys reported symptoms characteristic of the natural outbreaks in 32 to 72 hours in four animals by animal inoculation. The actual incubation period of rhinotracheitis under natural conditions is not known. The work done at Colorado A. and M. indicates that they have found a range of from 10 to 150 days. We have observed the average length of time for development of the disease after animals have been added to the feed yards to be about 60 days, with instances of occurrence in 30 days or less and 180 days or more. This does not refer to cattle that are received and fed a maintenance ration with a minimum amount of grain because it hasn't been our experience that they are likely to develop red nose until they have been placed on full feed of grain for some time.

**CAUSE**

The cause of rhinotracheitis apparently is not definitely known, but it is considered to be a virus or virus-like agent with a secondary bacterial infection of the respiratory system that accounts for the necrosis and diphtheritic membrane that covers part or all of the system from the nasal passages to the bronchi.

**SYMPTOMS**

The earlier symptoms consist of salivation and a light colored, sometimes blood tinged, nasal discharge accompanied by a bronchial cough; also red nose, conjunctivitis, and lacrimation. These usually precede any loss of appetite. The temperatures that we have observed have been in the 104 to 108 degree range early in the infection; in the more chronic form the temperatures usually range from 103 to 105 degrees. Mouth breathing with dyspnea and wheezing develop in from 12 to 72 hours; this is due to edema and diphtheritic membrane development. A very definite necrotic odor is present, on exhalation, in the more chronic cases. We have observed that the influenza-like cough may persist for as long as six weeks.

**POST MORTEM LESIONS**

The most prominent and characteristic lesion that we observed in the more acute deaths was a severe hemorrhagic tracheitis, pharyngitis, and laryngitis, varying from petechiation and ecchymosis to a more prevalent diffuse hemorrhagic inflammation. In the subacute to chronic cases there were necrotic areas covered by a diphtheritic membrane in the sinus, pharynx, larynx, and trachea in some cases extending into the bronchi. Often there is considerable edema present throughout the area. Less consistent and more confusing lesions are acute inflammation and ulceration of mucosa of the abomasum; also abscessation in the lungs and liver.

**MORBIDITY AND MORTALITY**

We have encountered several different forms of the infection as follows:

1. **The Acute or Explosive Type**
   - This type has a very sudden onset and may develop in 12 hours, wherein there will be one or two dead and another 10 to 20 per cent of the cattle showing multiple symptoms. With this type the condition may be present in nearly all of the cattle in the yard in four or five days time.

2. **Graphic Type**
   - We have observed those outbreaks wherein the cattle reach the peak of infection in about 15 days with a decreased incidence for another 15 days. Usually not over 25 or 30 per cent of the cattle are affected.

3. **Sporadic Type**
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In these yards we have observed occasional cases with a varying degree of severity. They may vary from two to 10 per cent that will require treatment over a period of 30 days.

Our mortality rate has been from two to 10 per cent of those animals treated; this variation is dependent upon virulence and owner cooperation. Early treatment is very important. In the earlier occurrence of the infection the mortality rate was higher in those yards that were fed with a mechanical feed wagon or truck, because, in many cases the animals continue to come up and eat even though they were showing considerable damage to the respiratory system. The owners just didn't get them out in time for a satisfactory treatment. After the disease became more prevalent the owners checked the cattle regularly between feedings and earlier treatment of the individual was far more successful.

CASE HISTORIES AND TREATMENT

Case No. 1. In October of 1954 we were called to observe a yard of 200 heifers that had been on feed for over 100 days; they weighed approximately 875 pounds. The weather was dry and the yards were quite dusty; we detected an occasional, influenza-like, bronchial cough, extensive salivation, some lacrimation and several were wheezing. Since, up to this time, there seemed to be no recommended treatment of the condition, we sorted off the seven heifers that seemed most in need of some form of treatment. Upon closer observation we found that they showed quite an inflamed nasal mucosa and conjunctivitis; their temperatures ranged from 105 to 108 degrees. They were given a triple-sulfon intravenously and 3,000,000 units of penicillin intramuscularly. The following day 14 heifers were treated in the same manner. Following the second day's treatment some time was spent in observing the untreated heifers in the yard and it was apparent that at least one half of them were approaching the stage of requiring treatment. After close observation and quite some discussion with the owner it was decided that it would be practical to treat the entire herd. This was done by giving sulfathiazole in the drinking water at the rate of ¾ grain per pound of body weight the first day and ½ grain per pound body weight the second and third day. Recovery was satisfactory and no further treatment was required; however, possibly due to the disturbance of the flora of the rumen, three of the heifers died of bloat within the next week. The cough continued for about three weeks but the heifers continued to make a normal gain and were marketed on schedule. No further treatment was required except for sprinkling the yards to keep the dust down.

Case No. 2. Late in December of 1954 we were called to observe a yard of 300 heifers that had received 100 days full feed on corn; they were earlier diagnosed by another veterinarian as having laryngotracheitis and had treated some 40 heifers of which 14 had died. The owner didn't care for any more individual treatment and knew of the treatment of the heifers in case no. 1. We dispensed sufficient sulfathiazole for treatment as outlined in case no. 1. They were so treated and the results coincided with those in the previous case. It also noted that in these heifers there was some disturbance of the rumenal flora and three of the heifers died of bloat. The owner was well pleased with the results and has remained a substantial client.

Case No. 3. This involved a yard of 350 heifers on feed about 75 days. Theirs was more of the sporadic type and necessitated treatment of from one to three heifers per day for five days. It was apparent that a mild form of the infection was active in the yard. The yard treatment in these consisted of a high level dosage of Hi-Amine®, for three days and continued with a lesser dosage for 10 days. The results were gratifying since no further individual treatment was necessary. We handled two other yards in a like manner, in the same feeding operation, during the winter and like results were obtained.
Case No. 4. The more acute type of rhinotracheitis appeared in a yard of 85 heifers in a smaller feeding operation. These heifers weighed about 850 pounds and had been on feed for 75 days; they were to be shipped the following week. The owner called and reported two heifers dead and a number of them very slow. Seventeen of the remaining heifers were removed from the yard showing multiple symptoms of the disease and temperatures to 109. Half of them were treated with triple-sulfa and penicillin and the other with one of the broad spectrum antibiotics intraperitoneally. Sixty of these heifers were rushed to market the following day; the remaining heifers recovered, some of them requiring subsequent treatment, and were shipped at a later date.

Case No. 5. In October of 1955 we were called to observe a yard of 240 heifers with rhinotracheitis of the acute type. One was dead and six were badly in need of treatment. They were given a broad spectrum antibiotic intravenously and penicillin; four of these recovered and two died after a varied treatment for the chronic condition that developed. The remaining 233 were given 10 cc of a penicillin-streptomycin combined aqueous solution intramuscularly. The results were somewhat gratifying and no further loss resulted, however, subsequent treatment with penicillin-streptomycin was given intramuscularly. It may be noteworthy that all of the previous cases dropped their food consumption as much as a third; this particular yard dropped from 18 pounds of grain and protein per day to three pounds over a four day period previous to treatment. A like herd treatment had been used in this same feeding operation several times with the onset of symptoms of the disease and with this procedure the losses have been nil.

At this point it might be well to mention, and since the above cases have been reported on heifers, that rhinotracheitis is not altogether a female disease. In our early observations there was definitely a predominance of it in heifers, however, during the last two years it has occurred quite regularly in steers as well as heifers.

SUMMARY

Veterinarians in feeding areas, or in concentrated livestock areas, must become familiar with a relatively new disease involving, primarily, the upper respiratory system; this disease is known as rhinotracheitis, red nose, or rhinitis in the bovine. The cause is not known but is believed to be a virus with secondary infection by bacteria. This disease was reported on the west coast, then became quite prevalent in Colorado, and now occurs as far east as the Missouri River and is considered quite prevalent in the feeding areas of northeastern Nebraska.

A number of treatments have been fairly successful in controlling the disease but early administration is very essential. A number of experiments are now being carried on, but it is not yet known how effective the feeding of antibiotics will be in helping control the disease.

THE ACTION OF ADRENALINE AND NORADRENALINE ON THE ISOLATED TOAD HEART. Heart perfusion fluid and apparatus were used on hearts of non-hibernating toads of species *Bufo marinus*. A study of the oxidative metabolism and work done by the spontaneously beating toad heart was used to investigate the action of adrenaline and noradrenaline on the heart.

Both produced an immediate and simultaneous increase in oxygen consumption, total useful work, maximum aortic pressure, and number of beats per minute. Adrenaline produced a fall in volume of blood per beat, noradrenaline an increase.

Both amines produced an increase in respiratory quotient reflecting increased carbohydrate metabolism. An increase in efficiency was recorded following administration of adrenaline, but no increase was recorded following administration of noradrenaline. [Nayler, Winifred G. The Australian Journal of Experimental Biology and Medical Science, 34:247–256. (August) 1956.]

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