Pink Eye: Infectious Keratitis, Keratoconjunctivitis

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Eye infections of cattle, commonly called "pink eye," may be caused by several different infectious agents. However, of the two most common forms of this disease, one is caused by bacteria and the other by a virus.

**BACTERIAL PINK EYE**

The most prevalent form of this disease is caused by *Moraxella bovis*. This organism produces a toxin which irritates and erodes the covering of the eye. Bacterial pink eye occurs mainly in the summertime. Bright sunlight, wind and dust may contribute to the cause of the disease. The infection affects both sheep and cattle. All ages of animals are susceptible but the disease is more common in young animals. Some breeds of cattle apparently are more resistant to the infection but cattle of any breed may be infected.

The causative organism will not live more than 24 to 48 hours if dried or exposed to direct sunlight. Transmission is mainly by flies and other insects which feed on the eye discharges of infected animals and then carry the infection to susceptible animals. Direct transmission by means of eye and nasal discharges is possible.

Two to three days after infection, redness of the eye and increased secretion of tears occur as the first signs of the disease. Tears frequently overflow the eyelids and run down the face. Affected animals may avoid the bright sunlight and tend to keep the infected eye closed or partially closed. The affected animal may have a slight fever, and feed intake and activity may be reduced because of the discomfort caused by the infection.

After another two to three days, a gray spot frequently appears in the center of the eye. This spot may become raised and ulcerated. In many animals the disease progresses no further than this and healing gradually takes place. However, if the disease does progress, opacity of the eye spreads outward. The entire clear area of the eyeball may be covered with a white to yellow plaque within five to seven days. The eye bulges into a cone shape and may eventually rupture.

Any time in the course of the disease the inflammation may start to subside. The entire course of the disease is usually three to five weeks. The final condition of the affected eye depends upon the extent of the damage which occurred. At one extreme, in severe cases, there may be rupture of the eyeball or severe scarring of the cornea, and permanent blindness results. In less severe cases, only a very small white scar may remain or complete healing may occur. Recovered animals may carry the bacteria in their eyes for a period up to one year and may be a source of infection to other animals. One or both eyes may be affected. Cattle do not die of the direct effects of the infection; however, losses can be severe because of decrease in weight and absence of growth and gain in affected animals. Occasionally animals with both eyes affected become blind and may die from starvation or other mishaps.

**Treatment:** Many treatments of pink eye have been utilized with varying degrees of success. Since all cases recover in time, the only beneficial effect of treatment is to shorten the course of the disease and make its effects less severe. This makes judging the value of treatment extremely difficult.

The most common treatment at present is the application of antibiotics and sulfa drugs to the affected eye as ointments, powders or sprays. *M. bovis* is highly susceptible to most antibiotics and sulfa drugs; if treatment is applied frequently and early in the course of the disease, results are often gratifying. If severe damage has already occurred to the eye before treatment is initiated, the effects of the treatment are diminished greatly. Since any medicine applied in the eye is flushed out rather quickly by the flow of tears, treatment must be made at frequent intervals if it is to be effective. Treatment of the eye should be done...
at least twice a day, and the more often the medicine is applied the more effective it will be. Since frequent application of medicine is often difficult or impossible under range conditions, the results of topical treatment under these conditions may be disappointing.

In the treatment of pink eye, antibiotics and sulfa drugs administered by injection are much less effective than are topical administrations. Extremely large amounts of drugs must be injected before sufficient quantities appear in the eye to be effective against the infection.

Foreign protein therapy, which is the subcutaneous or intramuscular injection of such things as non-specific vaccines, hog cholera antiserum, or sterile milk has been used to treat pink eye for many years. Indications are that this type of therapy is of some value. However, the precise effects are not measurable.

Cortisone is sometimes combined with various antibiotics and injected under the covering of the eyeball. The cortisone aids in reducing inflammation and pain and the antibiotics are held in the area of the infection without being washed away by the tears. This method has proven to be quite successful if applied properly and at the correct time. The injection requires some knowledge of anatomy and skill in administration. The timing of the injection is important since cortisone tends to slow healing, and if applied at the wrong stage of the disease may actually delay recovery of the animal. Therefore, it is recommended that this type of treatment be applied only by a veterinarian.

In some severe cases, recovery is hastened if the eyelids of the affected eye are sewn shut. This treatment is often carried out in combination with the antibiotic-cortisone injection.

Recovery is speeded up by keeping the infected animals in a dark barn. Medications containing dark blue or purple dye help to reduce the effects of the bright sunlight on the affected eye.

Prevention: There are indications that an attack of pink eye does result in some resistance to the infection, especially in the eye affected. All indications are that immunity is of local nature rather than systemic. This may explain why, in general, the use of vaccines against pink eye has not been successful. Control of flies, especially face flies and other insects which feed around the eyes, is an important step in controlling the spread of pink eye infection.

There are several indications that poor nutrition may increase an animal's susceptibility to pink eye infection. Vitamin A is probably of outstanding importance. However, the lack of Vitamin A does not produce pink eye, but may reduce the animal's ability to resist the infection.

When an outbreak of pink eye starts in a group of cattle the following measures will aid in reducing its spread and hastening the recovery of the affected animals:

1. Closely observe the animals at least once a day and look especially for any animal with excess eye discharge.
2. Immediately segregate and treat all animals with an abnormal eye discharge. Place them in dark quarters if at all possible.
3. Start an effective fly control program.
4. Supplement the ration to take care of any possible nutritional deficiency.

VIRAL PINK EYE

The best-known virus infection of the eyes of cattle is caused by the “red nose” or Infectious Bovine Rhinotracheitis (IBR) virus. When this organism infects the eyes of cattle, there may or may not be other signs of disease such as the respiratory infection or abortion commonly associated with IBR.

IBR conjunctivitis occurs most frequently in the winter but may be seen in the summertime. It affects only cattle. The disease is highly contagious by direct and indirect contact of infected animals with susceptible animals. All breeds and ages are susceptible but it is most common in animals under two years of age.

The first signs of this infection are redness of the eye and lids and an excess of tears. In contrast to bacterial pink eye, IBR affects mainly the eyelids and the tissues surrounding the eye. It causes a severe swelling of the lining of the lids. The swelling may be so extensive that the eyelids appear to be inside-out. Large amounts of white to yellow pus accumulate in the folds of the swollen lining of the eyelids and run down the face.

The eyeball itself is only slightly affected in most cases of IBR. There will be varying amounts of cloudiness of the eye and seldom does ulceration or bulging of the eyeball occur. Frequently there is a watery to purulent nasal discharge. The disease ordinarily runs its course in two to three weeks, but in a large group of cattle individuals may be affected over a period of three to four months.

Treatment: Treatment of IBR conjunctivitis is not ordinarily indicated and is seldom of any value. Occasionally antibiotic treatment helps reduce the amount of secondary bacterial infection that may occur.

Prevention: IBR conjunctivitis may be prevented by proper vaccination of animals prior to the onset of the disease. Vaccination of animals in the presence of the disease is not recommended since it is seldom effective in preventing the infection and actually may cause complications. The vaccine must be handled...
and administered properly if immunity is to be produced. It should never be used in pregnant animals.

Animals suspected of having IBR conjunctivitis should be kept segregated from all other cattle, especially young animals and pregnant cows. The introduction of the infection into young animals may result in respiratory infection as well as conjunctivitis, and pregnant cows may abort.

DIFFERENTIAL DIAGNOSIS

When an eye infection occurs in cattle, make an effort to establish a definite diagnosis. The great differences in character, seriousness, treatment and prevention of these two diseases make it imperative that they be distinguished one from another and from other causes of eye disease including injury and foreign bodies in the eye.