



Pinkeye in Cattle

INFECTIOUS BOVINE KERATOCONJUNCTIVITIS

Marie-Pierre Oury,¹ Patricia Scharko,² and John Johns³

Infectious bovine keratoconjunctivitis, more commonly known as pinkeye, is a contagious bacterial infection of the eye in cattle. The infection causes inflammation of the tissue lining of the eyelid and the eyeball itself. Ultimately, the cornea may become ulcerated, resulting in pain and possible blindness.

Pinkeye is a common problem, plaguing cattle across the country. A 1997 report by the National Animal Health Monitoring System (NAHMS) found pinkeye to be the second most prevalent infection in nursing calves more than three weeks old. In the same study, pinkeye was also shown to be the most prevalent condition in breeding beef females, occurring in 1.3 percent of the nation's cows.

The economic impact of the infection can be major. Pinkeye reduces the weaning weight of beef calves and can affect the price received for calves at sale. The effect of pinkeye on weaning weight is shown in Table 1.

In addition to the 36- and 40-pound loss in weaning weight, pinkeye can also affect prices received for cattle at sale because of price discounts. The magnitude of the discount, which can be quite large, will depend on the severity of the infection. Some estimates place the cost to the beef industry of decreased productivity and animal value due to pinkeye at \$150 million annually.

Causes of Pinkeye

A host of factors influence the incidence of pinkeye; however, the primary pathogenic agent is the bacteria *Moraxella bovis*. Multiple strains of *M. bovis* exist, with each capable of creating pinkeye in cattle. The surface of the bacteria is covered with hairlike structures known as pili. The pili allow the bacteria to attach to the conjunctiva of the cornea and introduce the injury.

Several factors predispose cattle to pinkeye. Any factor increasing eye irritation will result in increases of pinkeye, including increased eye irritation such as that caused by face flies, which may be the major irritant of cattle. Research has shown that as face flies feed on eye secretions, mechanical injury to the conjunctiva may result. Face flies are also the major vector of spread for *M. bovis*. The bacteria may remain viable on the

Table 1. Pinkeye's impact on weaning weight of beef calves.

	Bull Calves	Heifer Calves
Incidence of pinkeye (%)	56%	27%
Pounds lost due to pinkeye	36 lb	40 lb

Source: 1975 *Beef Cattle Research Report*, Progress Report 218, Kentucky Agricultural Experiment Station, 1975.

wings and legs of face flies for up to three or four days. Thus, a fly feeding on secretions from a calf shedding *M. bovis* may infect several other animals.

Ultraviolet radiation from bright sunlight may sensitize and irritate the eye, increasing the likelihood of infection. Cattle with little pigmentation around the eye may be more susceptible to this irritant, although animals with pigmentation around the eye can also develop pinkeye. Additional irritants include dust, pollen, and seeds from grasses or weeds in unclipped pastures or any other factor creating mechanical injury to the eye.

Age and presence of other organisms also predispose animals to pinkeye. Calves are generally more susceptible than older cattle, and male calves generally have a greater incidence than female calves. The presence of the Infectious Bovine Rhinotracheitis (IBR) virus, mycoplasma, or chlamydia increases the likelihood of *M. bovis* infection.

Nutrition may also play a role in pinkeye. Animals with a nutrient deficiency of energy, protein, certain trace minerals, and vitamins may have a greater incidence and severity of eye lesions due to compromised immunity.

Symptoms

Initial symptoms of pinkeye in cattle include inflammation and watering or tearing from the eye. Squinting of the eye due to painful sensitivity to light will be apparent, and the animal is likely to seek shade or some darkened area. Decreases in productivity will be evident as the animal grazes less.

Ulceration of the center of the cornea may develop shortly (the interval from onset to blindness may be as little as 48 to 72 hours), and the eye may become cloudy or opaque. In severe cases, the cornea will extend in a stalklike projection from the

¹Exchange student in Animal Sciences from French Agricultural University-ENESAD at Dijon

²Livestock Disease Diagnostic Laboratory, University of Kentucky

³Department of Animal Sciences, University of Kentucky

eye, or the eyeball itself will protrude from the socket. In most of the severe cases, permanent sight loss will occur. In some cases, a permanently scarred cornea will occur, but the animal will retain a degree of sight in the eye.

Treatment

Pinkeye must be treated as early as possible for best results. Early cases may respond favorably to a variety of antibiotics placed in the mucous membranes surrounding the eye. Topical application of antibiotics must be repeated frequently, however. If repeated handling of cattle is not practical or if a case is more severe, a subconjunctival (under the eye lid) injection of a mixture of antibiotic and corticosteroid is often used. The subconjunctival injection will maintain a higher corneal drug concentration than a topical application.

Moraxella bovis is highly susceptible to antibiotics; thus, in addition to direct antibiotic application to the eye, intramuscular injections of a long-acting oxytetracycline antibiotic will be effective in treating pinkeye. A repeat dose in 72 hours may be necessary, and this treatment should stop cattle from shedding *M. bovis* and serving as an infection source for other cattle. Never use long-acting oxytetracycline as a subconjunctival injection because it is severely irritating and will harm the eye.

Best results for antibiotic treatment will occur when infected eyes are protected from additional irritation. A patch should be cemented over the eye for protection, but never completely seal the eye. Leave the bottom of the patch unsealed so moisture can drain away. Use commercial products, or use pieces of old cloth such as denim with skin-safe adhesives. Having your veterinarian stitch the eye closed is a very acceptable alternative. Regardless of which method is used, the eye should be protected from further irritation for one to two weeks.

Prevention

Prevention of pinkeye, rather than treatment, is the optimal situation. Prevention means eliminating as many of the predisposing and infection-causing factors as possible. Control of face flies will eliminate the major vector of spread, and insecticide

Table 2. Effect of Chlortetracycline in Mineral Supplement on Incidence of Pinkeye.

	Control	Chlortetracycline
Number of calves	54	49
Percentage of calves with pinkeye	16.7	6.1

Source: 1985 *Beef Cattle Research Report*, Progress Report 291, Kentucky Agricultural Experiment Station, 1985.

use is necessary to control them. Insecticides may be applied through ear tags, sprays, back rubbers, dust bags, systemic pour-on or mineral supplements. Face flies do not stay on cattle at all times; thus, a method of continuous application of insecticide will be more successful in controlling them than periodic application such as sprays.

Grass and weed pollen or seeds can enter the eye and cause severe irritation when cattle are grazing if pastures are allowed to grow up and seed out, so clipping of pasture will help reduce the incidence of pinkeye. In addition, clipping will reduce the resting areas for face flies when they are not on the cattle.

Feeding of antibiotic in the mineral supplement has been shown to reduce the incidence of pinkeye in cattle. In a two-year summary, shown in Table 2, providing chlortetracycline in the mineral supplement at high levels significantly reduced the incidence of pinkeye.

Vaccination of younger animals (calves and yearlings) can be a good means of control. Younger animals are more susceptible because they lack the acquired immunity that older animals may have. A vaccine containing multiple strains of *M. bovis* will be most effective. In some situations, vaccines may not always reduce the total number of cases of pinkeye, but their use will generally reduce the severity of the eye lesion and minimize the possibility of the animal becoming permanently blind.

Controlling pinkeye can significantly increase the pounds of calf for sale at weaning and prevent price discounts for blind calves, so management of this common calf disease will put more income in the pockets of beef producers.

Contact: Patricia Scharko, Extension Ruminant Veterinarian, Livestock Disease Diagnostic Center, University of Kentucky.