

## **Bovine Eye Diseases: Pinkeye**

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The summer requires renewed attention to cattle eye health. The two most common problems-pinkeye and cancer eye-are responsible for serious losses due to:

1. reduced feed consumption from pain and blindness
2. treatment costs and milk discard from antibiotic use
3. reduced value at culling

This is the first of a two part article describing these two common conditions. Cancer eye will be discussed in the next issue. Pinkeye (Infectious Bovine Keratoconjunctivitis) is a contagious disease that damages the cornea (the clear portion of the eye) and conjunctiva. The causative agent is *Moraxella bovis*, but other factors such as direct sunlight and dust certainly contribute. Flies are important vectors involved in spread of the organism from one cow to another. The immune status of the cow also appears to play an important role in the disease occurrence. Cows are almost never affected with pinkeye more than once in their lifetimes, and seldom are affected in more than one eye.

The progression of clinical signs of pinkeye is consistent and predictable. Excessive tearing, reddening of the conjunctiva, and frequent blinking (lacrimation, conjunctivitis, and blepharospasm) are followed within 1-2 days by corneal ulceration and cloudiness (edema). The ulcer begins in the center of the cornea and may expand to occupy most of the cornea. In severe cases the ulcer may erode the entire thickness of the cornea, resulting in rupture of the eye and permanent blindness. Corneal edema may quickly affect the entire cornea, resulting in the characteristic "blue eye" seen in advanced cases. The eye is blind and very painful and the animal will hold it shut and avoid the sun.

Pinkeye typically occurs in an outbreak, affecting first lactation cows soon after calving. Younger and older animals are affected less often. Due in part to differences in risk factors and the presence of herd immunity, outbreaks occur at intervals of 3 to 5 years with sporadic isolated cases appearing between outbreaks. The goals of pinkeye treatment are to eliminate the causative agent using antibiotics and to prevent rupture of the eye. *Moraxella bovis* is susceptible to most antibiotics including penicillin and oxytetracycline. Early cases (tearing and conjunctivitis without ulcer and edema) are successfully treated with topical antibiotics. We recommend that during an outbreak, first lactation cows be examined daily and at the first sign of tearing, 1-2 cc of penicillin be squirted in the affected eye for 2-3 days. Feedbunk lockups simplify this procedure. Such early topical treatment will usually prevent progression to ulceration. Eyes with corneal ulcers require aggressive antibiotic treatment and veterinary consultation. We use subconjunctival injections of 1 cc of penicillin to achieve high levels of antibiotics in the eye. Neither of these uses of penicillin (topical or subconjunctival) will result in violative residues of antibiotics in the milk or meat. In beef cattle, a single dose of long-acting oxytetracycline has been used successfully in early cases. This treatment is now approved in dairy cattle, but withholding milk is necessary.

If the corneal ulcer is deep and appears likely to rupture, we sew the eyelids shut or sew the third eyelid to the upper lid across the ulcer. These procedures should be performed by a veterinarian. "Pinkeye patches", although popular and easy to apply, only protect the eye from the sun. Eyes covered with a patch cannot be medicated or monitored.

Corneal ulcer healing progresses in stages. Once the organism is eliminated, epithelium quickly covers the ulcer and the eye is much less painful. The eye will cease its excessive tearing and blinking and the animal will appear much more comfortable. Even though the "blue-eye" (edema) and blindness may remain for 1-2 weeks after the ulcer is healed, the eye no longer requires antibiotic treatment. Clearing of the edema begins at the edge of the cornea and sight will return accordingly. A central scar at the site of the ulcer will gradually shrink over a period of several weeks, but a small opaque area may remain for the lifetime of the animal.

Prevention of pinkeye is limited to fly control, since little can be done to reduce dust or exposure to sunlight. Several vaccines are available, most of which stimulate significant levels of circulating antibody against the organism or its pili. (The pili facilitate attachment to the conjunctiva.) There are numerous anecdotes in which producers describe the worst outbreak of pinkeye ever seen in their herd; begin to vaccinate the herd the following winter; and no pinkeye is seen that summer. However, controlled trials have failed to show that vaccination will reduce the incidence of naturally occurring pinkeye. The apparent benefits of the vaccine seen the year after pinkeye outbreaks are almost certainly due to herd immunity stimulated not by the vaccine but by the outbreak itself.