PINKEYE
INFECTIOUS BOVINE KERATOCONJUCTIVITIS

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Pinkeye, or Infectious Bovine Keratoconjunctivitis (IBK), is a painful eye disease that is common in cattle throughout the world. In the United States, losses reached $150 million in the mid-1970s and $200 million in the mid-1980s. The economic impact of IBK in the cattle industry results from a loss in production due to increased medical treatment costs and injury from extra handling, reduced weight gain, decreased milk production, and devaluation of sale animals due to eye disfigurement.

The bacteria Moraxella bovis (M. bovis) reportedly causes pinkeye. However, numerous physical factors have been shown to influence the appearance of the ocular disease such as breed and age of the animal, UV light exposure, wind and pollen conditions, and pasture conditions. The presence of other infectious organisms in the tissues surrounding the eye, as well as concurrent upper respiratory infections, can cause the Pinkeye problem to be much more severe.

Epidemiology

Pinkeye is an infectious eye disease of cattle that is found in nearly all breeds throughout the world. However, there is some evidence of breed-related differences in susceptibility. *Bos indicus* breeds, such as Zebu and Brahman, seem to be more resistant than *Bos taurus* breeds such as Hereford and Angus. There also has been some evidence to suggest that breeds with little or no pigmentation around the eye have a higher incidence of the disease.

Summer and early fall are the peak seasons for pinkeye, although it has been reported in all seasons. This is the time when the *M. bovis* organism can be recovered from cattle eyes at the highest rates. It is also the time when environmental factors that influence the development of pinkeye are at their peak. There are seven different types of *M. bovis*, and several different kinds within each type. Each type of *M. bovis* has slightly different physical properties, yet all are capable of causing disease. Immunity to one type does not mean the animal is immune to the other types of the organism. *M. bovis* has the ability to switch from one type to another and, in doing so, is able to evade the immunity that the animal may have to infection. Face flies are a very important factor in the spread of the disease within a herd. Flies pick up and spread the organism on their legs while feeding on the area around the eyes.

Calves are much more susceptible to pinkeye than older cows or bulls and animals that have been infected once are not likely to develop the disease again for more than a year. Environmental factors such as UV light, wind, dust, tall pasture grasses and weeds will lead to a higher rate of disease within a herd.

The presence of other organisms in the conjunctiva, the pink inside lining of the eyelid and covering on the

eyeball, may increase the severity of the disease. Mycoplasma is an organism that may play a significant role in the pinkeye disease process.

Clinical signs

The clinical appearance and rate of progression of the disease will vary from animal to animal. One or both eyes may be involved. The earliest indication of a problem is an increase in tearing and squinting. Animals will have excessive wetness around their eye and down the side of their face and be reluctant to open their eye. If both eyes are involved, the animal may be hesitant to move. When examined more closely, the inside lining of the eyelid (conjunctiva) and the white portion of the eye (sclera) may appear red and puffy. As the disease progresses the clear portion of the eye (cornea) may become cloudy or white. An ulcer (erosion) may develop in the cornea. This is when the eye is most painful. Healing occurs when blood vessels move into the normally clear cornea and the healthy corneal cells slide across the ulcer. If the ulcer is severe and deep enough, the eye can rupture. Most infected eyes will heal in 3 to 6 weeks. Eyes that have been severely affected will have a white scar on the surface. These scars may fade over time. Eyes that have ruptured may become blind and extremely disfigured.

Treatment

Antibiotic therapy and control of environmental factors are the best methods of treatment. Most strains of *M. bovis* are susceptible to oxytetracycline, penicillin, ampicillin, erythromycin, florfenicol and ceftiofur. Eye drops or ointments are one method of treatment for animals that are in a confined space and accustomed to being handled—this might be used for dairy operations or show animals. Eye preparations should be used three or more times daily for one or more weeks. This method of treatment is not practical for most beef producers or large dairy operations. Oxytetracycline injections given subcutaneously, under the skin, just in front of the shoulder are effective at increasing the rate of healing. Penicillin alone or in combination with a steroid may be given as a subconjunctival injection. The use of a steroid helps to decrease the inflammation that accompanies the infection. In severe cases, the treatment should be repeated in 3 days.

Covering the eye with a cloth patch glued over the face will help to make the animal more comfortable by decreasing the sunlight irritation. More importantly, it helps to decrease the spread of the disease by preventing flies from getting to the infected eye secretions. Good management practices may increase the rate of healing and decrease the spread of infection. Separating affected cattle and providing them a shaded area, with accessible food and water, lowers the animals stress and allows them to heal more efficiently.

Prevention

Prevention of IBK is difficult because of the different types of *M. bovis*, its ability to change from one type to another, and the predisposing environmental conditions. Fly control is one of the most important factors. Insecticide-impregnated ear tags in both ears has been shown to decrease the spread of disease. Alternatively or additionally, insecticide sprays, pour-ons, dusters, and back oilers can be used. Providing shaded areas helps to decrease the amount of UV light exposure. Mowing or cutting tall grasses or weeds may reduce the irritation to the animal's eyes. Vaccinations for infectious bovine rhinotracheitis (IBR) have been shown to increase the severity of the disease. Although vaccination for IBR is highly recommended for good herd management, it should be avoided during an outbreak of pinkeye.

The fact that animals appear to be immune to *M. bovis* infection for up to 12 months after an infection and that older animals have a higher level of natural immunity, would lead one to believe that vaccination would provide an effective method of prevention. Experimental work has shown that animals vaccinated with one type of *M. bovis* will be immune to that type but not the others.

Many vaccines on the market today contain several types of *M. bovis*. Although these vaccines have been shown to be partially protective, they may not be completely protective. This may be due to the ability of *M. bovis* to change type, the presence of other organisms in the eyelid tissues or environmental factors that allow the organism to overcome the animal's immune system.

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