

Pinkeye in Beef Cattle¹

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Introduction

Pinkeye also known as, infectious bovine keratoconjunctivitis (IBK), infectious keratitis, or blight is one of the most common diseases of beef cattle. It is a highly contagious disease causing inflammation of the cornea (the clear outer layer) and conjunctiva (the pink membrane lining the eyelids) of the eye. It is also associated with ulceration of the cornea, and potential loss of an eye. Pinkeye is frequently a self limiting disease with mild to severe clinical signs and blindness in approximately 2 percent of the cases. The incidence of pinkeye within a herd increases in the spring peaks in the summer and decreases in the fall.

Pinkeye is associated with significant economic losses. An estimated 150 million dollars is lost yearly to pinkeye through decreased weight gain, decreased milk production, and treatment costs. Pinkeye can be a common condition affecting breeding age beef heifers, and it is a common disease of nursing calves greater than three weeks old. Affected animals may also bring significantly discounted prices when sold. Animals which are blind in both eyes are at risk of death through accidents or starvation and they are also a significant animal welfare concern.

Causes of Pinkeye

The primary infectious agent for pinkeye is the bacterium *Moraxella bovis*. This bacterium is found in the eyes of many recovered and apparently normal cattle. Pinkeye is a multifactorial disease, which means there are many factors that predispose and contribute to the development of the disease.

Eye irritation is necessary for the development of the disease. Face flies feed around the eyes and nostrils of cattle, causing a mechanical irritation to the eye and spreading the disease from one animal to another. The bacteria can survive on the flies for up to four days, allowing that fly to infect numerous animals.

Other sources of eye irritation which predispose the animal to disease are tall weeds and grasses, feed and dust, and the center of round bales. Dust on windy days, and exposure to excessive UV sunlight also increase the chances of disease development. Breeds which lack pigment on their eyelids are more susceptible to pinkeye because of their increased sensitivity to sunlight and a decreased immune response in the eye. There appears to be a higher prevalence of the disease in *Bos taurus* cattle than in *Bos indicus* cattle and cross bred cattle may be more

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resistant. Calves are more likely to develop the disease than adult cattle. Adult cattle appear to develop protective antibodies on the surface of the eye. As with many diseases, the disease outcomes can be influenced by nutritional imbalances such as deficiencies of protein, energy, vitamins (especially vitamin A, if the forage is of lower quality) and minerals (especially copper and selenium). The presence of other organisms, such as the infectious bovine rhinotracheitis (IBR) virus, mycoplasma, chlamydia, and *Branhemella ovis*, will increase the incidence and severity of disease.

Transmission

Transmission occurs when a noninfected animal comes into contact with secretions infected with *M. bovis*. This exposure may be direct contact, transmission by face flies, or contact with an inanimate object that harbors the organism. Face flies are considered the primary vector for spreading the bacteria and disease. Secretions from the eye nose or vagina can be infected with the organism. Carrier animals are animals that show no signs of clinical disease but shed the bacteria in their secretions. Carrier animals may shed the organism for long periods of time so they are an important factor in the spread of the disease and its survival over winter.

Clinical Signs

There are four stages of pinkeye. The disease may resolve at any stage while animals that receive no treatment will often progress through all four stages.

- **Stage I:** Cattle have excessive tearing and increased sensitivity to light. They will blink frequently and there is redness along the eyelids.
- **Stage II:** The clinical signs described in Stage I continue, but an ulcer spreads across the cornea.
- **Stage III:** The ulcer covers most of the cornea and the inflammation continues to spread into the inner parts of the eye.

- **Stage IV:** The ulcer extends completely through the cornea, and the iris. These eyes may be permanently damaged and the animal rendered blind.

Treatment

Early treatment of cattle with pinkeye is important, first for a successful outcome for the affected individual animal and then to stop the shedding of the bacteria, decreasing the risk of transmission to other cattle. It is equally important to remove animals suffering from pinkeye from the herd because they serve as a reservoir for the organism. Long acting tetracycline antibiotics and tulathromycin are labeled for use in treating pinkeye.

Experimentally florfenicol and tilmicosin have been successfully used to treat animals suffering from pinkeye. Treating an animal for pinkeye includes covering the eye which assists in reducing irritation, decreases the potential for spreading the organism, and protects the eye from further damage both from the disease process and the environment. There are sprays and ointments labeled for the treatment of pinkeye. These products are only effective if used three to four times daily, which generally is not feasible for most producers. Also many of the commercially available ointments are either illegal for use in cattle or have very long withdrawal times. When treating several animals you should wash your hands or change gloves between animals avoid further spreading the bacteria.

Prevention

Many strategies for preventing pinkeye have been tried over the years. The random nature of pinkeye outbreaks and the numerous factors that contribute to the disease have led to many myths and misconceptions regarding pinkeye prevention. Management practices that reduce the risk factors associated with pinkeye are the most effective tools in decreasing the incidence of disease. With a lower incidence of disease, the overall concentration of bacteria on the farm will be lowered, reducing the risk of a severe pinkeye outbreak.

Fly control is essential but can be difficult because face flies are only on the animal for a small percentage of the time. Therefore, targeting the egg

and larval stages of the fly as well as the adults may be most effective. Fly infestations are moderate to heavy when there are 10 to 20 flies per animal during the middle of the day. A single fly-control program will not work on every farm. Multiple methods of fly control may be necessary to achieve satisfactory results. Some examples are; fly tags, fly traps, insecticide pour-on, back rubbers, dust bags, and knock-down sprays. All are helpful in reducing the number of adult face flies. Feed additives that target fly larvae hatching in the manure pat are also available. Promoting dung beetles, to break down the manure pat will also decrease egg survival and the number of mature flies. Face flies can develop resistance to pesticides over time, so switching the drug class of the pesticides used every year is important. For example, if pyrethrins are used one year, then organophosphates should be used the following year. Waiting until the start of fly season to apply fly tags and removing the old fly tags in the fall also decreases the development of resistance. It is extremely important to follow the safety precautions recommended by the manufacturer because these insecticides can be toxic to people if handled improperly.

A management program to improve the overall condition of the cattle and decrease the incidence of this disease would include lowering overhead hay feeders, rolling out round bales, providing adequate bunk space, isolating affected animals, instituting an appropriate vaccination program, and providing quality nutrition and minerals at all times. Appropriate grazing and pasture clipping to prevent seed-head development helps to decrease irritation to the eyes of cattle, and reduces resting areas for flies. Clipping pastures to a low stubble height just after the seed heads emerge and again in mid summer when weeds appear is recommended. Shaded areas should be available to decrease animals' UV exposure. Pinkeye vaccines are commercially available and producers are encouraged to contact their veterinarian regarding their efficacy and their use. Autogenous bacterins have also been used in an attempt to control this disease. Recommendations regarding the vaccination of a herd should be provided by the attending veterinarian.

In summary, Pinkeye is a serious health problem for beef cattle. With early intervention appropriate treatment and disease management, its effects on a herd can be managed, minimizing damage to the eyes of infected cattle.

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