Disease Headaches in Kentucky: Pinkeye, Anaplasmosis, Listeria

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Pinkeye

Pinkeye, or infectious bovine keratoconjuctivitis, can affect cattle of all ages, but it is primarily a disease of calves. Outbreaks commonly occur in the summer, primarily due to exposure to sunlight, dust and flies. The economic impact of the infection can be major. Pinkeye can affect both growth and price received for calves at sale. Calves left with scars on the cornea are referred to as "blue eyed" and subject to discounts in the markets. If the corneal ulcer ruptures, the calf becomes "pop eyed" and heavily discounted at any sale.

Causes of Pinkeye

A host of factors influence the incidence of pinkeye. However, the primary pathogenic agent is the bacteria *Morazella bovis*. Multiple strains of *M. bovis* exist with each capable of creating pinkeye in cattle. The surfaces of the bacteria are covered with hair like structures known as pili. The pili allow the bacteria to attach to the conjunctiva of the cornea and begin the injury. Adhesion prevents the bacteria from being washed away by tears. Recent eye cultures have indicated another bacteria involved in pinkeye cases in Kentucky and other states. It was originally named *Morazella ovis* but renamed to *Branhamella ovis*.

Several predisposing factors influence the incidence of pinkeye. Any factor increasing eye irritation will result in increases of pinkeye. Face flies may be the major irritant of cattle. Research has shown that as face flies feed on the secretions from the eye, mechanical injury to the conjunctiva may result. Face flies are also the major vector of spread for *M. bovis/B. ovis*. The bacteria may remain viable on the wings and legs of face flies for up to 3 or 4 days. Thus a fly feeding on secretions from a calf shedding *M. bovis/B. ovis* may infect several other animals.

Ultraviolet radiation from bright sunlight may sensitize and irritate the eye, increasing the likelihood of infection. Individuals with little pigmentation (white hair) 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, wind, 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 IBR virus as well as mycoplasma and chlamydia increase the likelihood of *M. bovis* infection.

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

Clinical Signs

Initial symptoms of pinkeye in cattle include a swollen eyelid and tearing from the infected eye. Squinting of the eye is due to painful sensitivity to light. The animal is likely to seek shade to minimize exposure of the eye to sunlight. The center of the eye/cornea appears white in a day or two. Ulceration of the center of the cornea may develop shortly and the eye may become cloudy or opaque. The interval from onset to blindness may be as little as 48-72 hours. In severe cases when the ulcer ruptures, the cornea will extend in a stalk-like projection from the eye or the eyeball itself will protrude from the socket. Permanent sight loss will occur in most of the severe cases. In some cases, a permanently scarred cornea will occur but the animal will retain a degree of sight.

Treatment

Pinkeye must be treated as early as possible for best results and to eliminate the carrier state in cattle. Response to treatment is best if the calves are caught and injected subcutaneously (under the skin) with Nuflor® or a long acting tetracycline at label dosage (for example LA 200® or Tetradure®). *Moraxella bovis* is highly susceptible to antibiotics, and *Branhamella ovis* appears also to respond to antibiotics.

In addition to the injection, 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 in more sever cases, a subconjunctival (under the eyelid) injection of a mixture of antibiotic and corticosteroid is often used. Never use long-acting oxytetracycline as a subjconjunctival injection. It is severely irritating and will harm the eye. Other topical medications have been used with varying results. Work with your veterinarian to determine what would be the best way to treat the eye on your farm.

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. Never completely seal the eye. Commercial products are available or pieces of old cloth such as denim may be used with skin safe adhesives. Your veterinarian can suture (stitch) the eye closed which is a very acceptable method. Regardless of which method is used, the eye should be protected from further irritation for 1 to 2 weeks.

In an extreme outbreak when 10% or more of calves are affected, all calves should be handled and given a long acting tetracycline injection. Another alternative is to feed chlortetracycline (example Aureomycin® or CTC) to the cattle at the same level for Anaplasmosis prevention (0.5 mg per pound of body weight per day, minimum of 350 mg in cattle weighing less than 700 pounds) during the remaining fly season.

Prevention

Preventive management practices are more cost-effective than treating calves individually in an outbreak. 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. Insecticide use is necessary to control face flies. They 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 control than periodic application such as sprays.

Clipping of pasture will aid in the reduction of pinkeye incidence. In addition, clipping will reduce the resting areas for face flies when they are not residing on the cattle.

Vaccination of younger (calves and yearlings) animals 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. Vaccination is most effective when done before fly season. Follow manufacturer's recommendations for dosage and administration; some commercial vaccines require a booster to maintain immunity during the summer and fly season.

Pinkeye caused by *Branhamella ovis* appears **not** to be protected by the commercial vaccines that are currently available. Some veterinarians have cultured infected eyes, had *B ovis* isolated and produced an autogenous vaccine. These vaccines have helped producers who had been vaccinating with commercial products, yet still experienced serious pinkeye problems. It is important to have a valid veterinary-client-patient relationship (VCPR) to diagnose the problem and use an autogenous vaccine.

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

References to specific commercial products are for educational purposes only and not considered an endorsement of the product and exclusion of others which may be similar. Persons using such products should follow the label directions of the manufacturer and work with their veterinarian.

Anaplasmosis

Anaplasmosis is a disease in cattle caused by the rickettsial pathogen *Anaplasma marginale*. This pathogen invades the red blood cells, preventing them from carrying sufficient oxygen to the brain and other vital organs. Anaplasmosis can decrease productivity and wipe out up to 50% of the adult herd in just weeks. This can result in

thousands of cattle deaths, costing producers millions of lost dollars per year in the U.S. from mortality, abortions, and reduced milk and beef production.

Stress is a major factor

The disease is often fatal in cattle over 2 years of age. Infected animals may not show signs for up to 2 months after exposure, or until stressed. Often the signs of the disease may become visible only after cattle are transported and processed. The Livestock Disease Diagnostic Center diagnoses most of the anaplasmosis cases in August through October, with the majority of deaths occurring in September. Since anaplasmosis outbreaks are linked to stress, a never-ending problem in the cattle industry, the herd is always at risk.

Usually appearing after a four to six week incubation period, the signs of the disease include depression, emaciation, a rapid drop in production, fever, anemia and jaundice. Other clinical signs include weakness, dehydration, loss of appetite, constipation and a stiff, unsteady (stagger) gait. Abortion may occur when infection occurs late in gestation.

Like recovered adult cattle, calves and yearlings carry the disease but show few signs. Because these animals do not appear to be infected, they remain in the herd providing a source of infection to cattle that do not have anaplasmosis. A single infected calf, yearling, or surviving animal can destroy an entire adult herd in just a few months. Primarily spread by sucking (especially ticks) and biting insects, anaplasmosis is also transmitted by contaminated needles, dehorning and surgical instruments.

Prevention and control

To eliminate the disease, uninfected animals must be **protected** and infection in carrier animals must be **controlled**. Ticks can transmit Anaplasmosis; horse flies and horn flies have been incriminated in the transmission. Insect control is an important aspect of anaplasmosis control. Permethrin is an insecticide available in sprays, back-rubber, and dust bags which effectively controls anaplasmosis-carrying insects.

Direct transfer of infected blood by iatrogenic procedures (contaminated needles, dehorning/castration/implanting/ear tagging equipment that is not disinfected between animals) can result in transmission. Using clean medical equipment and eliminating carrier animals can curb the spread of disease. Needles should be changed often between animals, especially when intramuscular injections are given.

The commercial vaccine is no longer available. Experimental vaccines have shown efficacy in controlled trials.

Treatment

Tetracyclines are the antibiotic of choice for treating acute disease. Resistance has not been reported. In acute cases, one to two administrations of long-acting oxytetracycline at 72 hour intervals is an effective treatment.

To obtain complete clearance, long-acting oxytetracycline must be given every 72 hours for a total of 12 to 14 days of treatment. Not all cattle treated with this regimen will clear the infection. Cattle should be tested four to six months after treatment (before fly season) to determine if they remain as a carrier. Any cattle that tests positive should be then removed from the herd if they continue to test positive after treatment.

Aureomycin (chlortetracycline), a broad-spectrum antibiotic, is the only medication approved in the U.S. for control of anaplasmosis in beef cattle through the feed. Consequently, it offers the most convenient, most economical antibiotic control of this disease. Recent studies at Oklahoma State University prove that Aureomycin prevented death losses and the development of carrier animals. To maximize the protective benefit of Aureomycin in feed, provide 0.5 mg of Aureomycin per pound of body weight per day to cattle weighing over 700 poulds. Cattle weighing less than 700 pounds should receive a supplement containing 350 mg per head daily basis. In addition, Auremycin has zero-day withdrawal at all feeding levels in cattle. Cattle in Kentucky should be given Aureomycin beginning in June/July to avoid deaths in the fall.

Listeria

Listeria monocytogenes is widely distributed in the environment. Listeria organisms have been isolated from soil, water, vegetation, milk and fecal material from both healthy and diseased animals and humans. The organism resists freezing, thawing and desiccation; bacteria can survive for long periods of time (2 years) on pasture or other land spread with manure or sewage sludge. Listeria multiplies at temperatures as low as 1º C (refrigerator temps). It does not survive for more than 1 to 2 weeks in properly preserved silage.

Listeria grows well in poorly ensiled or spoiled feedstuffs. Heaviest contamination with *L. monocytogenes* is typically found in spoiled or moldy areas of the feed, where oxygen is not excluded or pH remains high. In particular, wet hay crop silages with pH of 5.5 or higher provide good growth conditions for Listeria. These same conditions also promote growth of clostridial organisms, except that clostridial growth is more frequent in anaerobic conditions. Frozen silage falling off the interior walls of tower silos or spoilage in balage systems is often implicated in listeriosis outbreaks in livestock. In the northern hemisphere, listeriosis has a peak prevalence in ruminants in late winter and early spring.

Veterinarians and nutritional consultants suspecting Listeriosis outbreaks can check the pH of potential feed sources with pH strips or a hand-held pH meter. Feedstuffs can also be cultured for *L. monocytogenes*; however, isolating the bacteria from feed or food samples usually requires enrichment procedures. Prior to submitting samples, inquire as to the laboratory's experience in identifying feed or food-borne pathogens and to any requirements for shipping of samples. Contaminated areas of feed have been shown to contain over 1 million CFU of *L. monocytogenes* per gram of feedstuff.

Many of the animals exposed to *L. monocytogenes* will develop inapparent infections. Of those animals which become clinically ill, the most common clinical presentations are

encephalitis (circling disease), septicemia, and abortion. Incubation period is ten days or longer. The survival rate in treated animals is considerably higher than in untreated patients. The disease in goats and sheep tends to be more acute and results in a higher case fatality rate than in cattle. Outbreaks in goats and sheep often occur without access to silage. The source may be the feces of carrier animals or rotting vegetation in pastures or feed bunks.

The recovery rate is greatly improved with early detection and treatment. Recumbent or comatose animals rarely survive despite intensive treatment. Recommended treatments are either oxytetracycline or penicillin G. Treatment should continue for 14 to 21 days.

Listeriosis is a zoonotic disease; aborted fetuses and necropsy specimens should be handled with care. Dairy workers should be cautioned against consumption of raw milk from a dairy where an outbreak occurs. Veterinarians and nutritional consultants can limit an outbreak by identifying spoiled feedstuffs and eliminating them from the ration.