

PINKEYE IN BISON

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Ah, the days of summer! "A little bit of summer is what the whole year is about," John Mayer said.

I doubt Mayer was thinking about pinkeye. Whether you find your cattle's eyes getting all bleary or your bison squinting and showing white eyes, pinkeye sure can distract from our beautiful Ontario summer. Pinkeye, also known as infectious conjunctivitis, is a significant problem for bison, generally from May to September.

We are quite familiar with pinkeye in cattle. In fact, people can explain exactly:

- a) which bacteria are involved (*Moraxella bovis*);
- b) which flies can carry the bacteria from animal to animal, and how they do it (*Musca autumnalis* regurgitates the germ while feeding around the eye);
- c) which environmental factors lead to higher risk for cattle to get pinkeye (certain breeds and colourations, exposure to UV light, irritation to the cornea of the cattle); and
- d) which medication to use to fight pinkeye (oxytetracycline is often a first-line treatment).

We know a lot about pinkeye in cattle. In bison? We know remarkably little about pinkeye in bison. We know bison get pinkeye, and it seems exactly like the cattle version of pinkeye. Bison will have excessive tear production (with the little rivulets of tears running down the side of their faces), white and/or bleary eyes, and sensitivity to sunlight. From a bison herd viewpoint, pinkeye is quite contagious. It has high level morbidity--many of the bison will get pinkeye--and rapid spread from one to the other. What's more, the same medication that treats pinkeye in cattle works to treat pinkeye in bison. Unfortunately, nobody actually has scientifically proven the specific causes and factors for pinkeye in bison. Because bison pinkeye and cattle pinkeye look the same and act the same and seem to have the same environmental factors and respond to the same treatment, this article will consider bison pinkeye and cattle pinkeye to be the same disease. I will talk about the disease in bison using what we know from cattle pinkeye.

Moraxella bovis is usually part of the normal flora in cattle eye, which means that most healthy cattle have these bacteria in their eyes. Evidence suggests the same is true for every bison herd in Ontario.

What, then, takes the bacteria from merely happily living in the eye to causing conjunctivitis? Here are several of the main culprits:

1. Sunlight, specifically, UV light, can lead to damage in the cornea of the eye. When these damaged cells repair themselves, the repair job is not quite "as good as new." *Moraxella bovis* is better at sticking to these repaired cells than sticking to the undamaged original epithelial cells of the cornea. The longer the bacteria are able to stick to those repaired cells, the greater the chance they will cause disease. The bison's eye normally protects itself by trying to wash all irritants away and flush them out of the eye with tears, but the longer the bacteria stay there, the more firmly they can adhere to the cornea. This leads to further irritation and damage to the cornea.
2. Mechanical irritation to the cornea. This is an umbrella term to refer to things that cause tiny scratches on the cornea. What things? Long grass, dust or pollen being blown around, and even fighting! (We see pinkeye more commonly in young bulls rather than older bulls. The young bulls spend more time jostling and head-butting, and we suspect this leads to

mechanical irritation of the cornea in that age category.) These tiny clefts and lesions in the cornea from the scratches increase the surface area of the cornea, and the tears are not able to do quite as good a job at cleaning and lubricating those scratched areas as a normal cornea. This also leads to the *Moraxella bovis* being more able to stick to the corneal cells in those scratches.

3. Those face flies, *Musca autumnalis*, like to drink bison tears. The tongue of the fly "rasps" the cornea (yes, this picturesque term is used by Vet Clinics of North America's book on pinkeye in cattle) as the fly is lapping up the tears. This is one more cause of mechanical irritation to the cornea, leading to scratches on the cornea. How do the flies carry the bacteria from one animal to the other? The flies pick up the bacteria from one animal's scratches in its cornea, and then the flies allow the bacteria to live in their guts. Then, when the flies are feeding on the tears of another animal, they regurgitate into their feeding areas, and thus spread lots of *Moraxella bovis* along with whatever else they manage to regurgitate at the time. (I'm not an expert on fly regurgitation.) *Musca autumnalis* manages to cause the scratch and then inoculate that very scratch with the bacteria!

Good management, then, will reduce the pinkeye problem in bison. We don't know of anything to eliminate the risk.

Providing lots of trees can be a double-edged sword as shade can protect the bison from UV light, but the lower branches can cause mechanical irritation to the eyes as the bison walk through the trees. I suggest providing tree cover and trusting the bison won't walk into branches! (I also trust they won't get too much pollen blown into their eyes, thanks to their shaggy hair coat around their eyes and their ability to squint.)

A good rotational grazing system and keeping the pasture short will make a big difference in reducing the pinkeye risk.

Most Ontario bison herds are relatively small--20 head or less--and therefore the entire herd is housed together as a group, but if it is possible to keep young bulls apart from each other, that will also reduce the risk of pinkeye.

Controlling the fly population is probably the single most important factor that your good management can influence. Bison have wallows where they roll in the dirt, and these wallows provide an ideal breeding ground for flies. Since cleaning up those wallows is not an option (wallowing is an important part of the natural behavior of bison), we need to find ways to reduce the fly population. Spraying the wallows with a fungal spore that penetrates and kills a specific insect host seems quite effective. There are also fly predator products which parasitize the fly larvae.

Finally, if you are dealing with an outbreak of pinkeye in your bison herd, yes, there are excellent treatment options. I will use three categories:

1. If you treat your bison in a chute, I suggest using injectable long-acting tetracyclines.
2. If you need to dart your bison, a dose of a long-acting macrolide has been very effective, in my experience. There are medications that are concentrated enough that you only need 10-12 mL, which is the maximum amount that fits in a dart, and a single dose is sufficient to clear up the pinkeye.

3. If you find a significant number of your herd is suffering from pinkeye at once, e.g., over a third of the entire herd, you may want to consider feed or water treatment. Medicating the water seems more effective than medicating the pasture mineral.

These are generalities. Please talk with your veterinarian about specific medications, dosages, and ways to administer the medication.

And enjoy what's left of the summer!

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