KENTUCKY STATE UNIVERSITY COOPERATIVE EXTENSION | FACT SHEET

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"Star Gazing": Polioencephalomalacia in Small Ruminants

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Polioencephalomalacia (PEM) is a relatively common disease in small ruminants. It is also referred to as "star gazing disease" or "polio." PEM manifest itself as neurologic symptoms but it is actually a nutritional disease. It is caused by decreased thiamine (vitamin B1) to the brain. The brain tissues have high energy demands and thiamine is needed for glucose to function in the brain tissues. The result of low thiamine levels is cerebrocortical necrosis (dying brain tissue).

One of several functions of a healthy rumen is B vitamin synthesis. In normal adult ruminants, the microbes in the rumen should make enough thiamine for the animal. PEM may be caused by the lack of thiamine, or in other cases there may be enzymes that are destroying thiamine or other substances that affect the function of thiamine.

When kids/lambs are first born, their rumens are not developed yet and B vitamins, like thiamine, need to be provided in the diet. This can be one reason polio is more common in younger animals. If an adult animal is not eating or if its rumen has a severe acidosis to where the microbes die or there are sudden changes in the microbe population, the digestive upset may cause PEM.

Thiaminase is an enzyme that breaks down thiamine in the animal's system. It may be ingested from certain plants or released by gut bacteria in certain conditions. Diets high in sulfur interfere with the function of thiamine. Diets that are high in commercial byproducts or certain oil seed mills

contain high sulfur content. Byproducts such as distillers grains can also be high in sulfur. Distillers grains should not exceed 30% of a ration and each batch of distillers grains may widely vary in sulfur content, so some batches of feed may be higher. Plants or forages that occasionally have high levels of sulfur or affect thiamine levels are alfalfa, Canada thistle, Kochia, lambquarter or cruciferous plants like turnips, and mustards or oil seed meals. In some areas, water sources may have higher sulfur contents as well.

Many sheep and goat producers use amprolium (Corid) to treat herd problems with the parasite coccidia. Amprolium may decrease blood thiamine levels. At labeled doses, cases of PEM will happen rarely; however, if animals have other factors such as digestive upset or the presence of amprolium in a water source that evaporates quickly, several animals may be affected. It is still considered a safe product, but animals should be watched closely for symptoms of PEM when treated with amprolium and for a week after treatment.

The first clinical sign of PEM is loss of vision. By using their other senses, animals with PEM may still be with the herd, so it may be hard to notice this condition in the early stages. Sometimes they will have an exaggerated gait and pick their legs up higher with uncertain steps when walking. As it progresses, many times their head will be elevated and it appears they are looking blankly into the sky, hence the term "star gazing." Over the course of hours, the animal becomes recumbent (unable to stand), then begins to have uncontrollable seizures. The later symptoms may be difficult to distinguish from a listeria infection (see listeriosis fact sheet).

Treatment

As these symptoms develop from the lack or interference of thiamine, it is not surprising that the treatment is administering thiamine injections. Thiamine should be administered intramuscularly (IM), twice daily, for a minimum of three days. Supportive treatment includes anti-inflammatories such as dexamethasone to decrease swelling of the brain. Also, if the animal is not eating, drenches are beneficial to increase nutrition until medications work. Antibiotics are frequently given for two reasons, they may be given prophylactically or to prevent bacterial infections in the inflamed tissues. Or in the late stages of the disease symptoms closely resemble some of those of the bacterial disease listeria, if the diagnosis isn't certain the antibiotics should be used. Treatment is much more effective when the disease is recognized early. Once the animal is recumbent or seizing, the overall prognosis becomes poor. The rapid progression of the disease makes it challenging. Unfortunately, nerve and brain tissues do not regenerate well once damaged. Even many animals that do recover may have residual damage such as permanent vision loss.

As we talk about prevention, remember that this is a nutritional disease. Sheep and goats need to have an adequate and balanced diet, especially in young animals that do not have a fully matured rumen yet. In adult animals, we need to keep the rumen happy with fiber sources to prevent acidosis or sudden changes that may upset the microbe populations or functions. Avoid weeds in pastures that may have a thiaminease activity. Prevent feeding diets that are in excess of 30% byproducts. Monitor animals closely for any signs of illness. The initial signs of vision loss may be very subtle when looking at an animal in a large group; however, there is a huge difference in prognosis if the animal is not noticed for 24 hours. While it may not be possible to avoid ever having animals with PEM, cases should be rare. By understanding the symptoms and early recognition, it is a manageable disease.

References

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