

Post-Partum Hypomagnesemia in Cattle and its Management

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Abstract

Post-parturient hypomagnesemia, also known as grass staggers or grass tetany, is a complex metabolic disturbance in cattle characterized by low levels of magnesium in the blood following calving. This condition typically affects lactating cattle grazing on lush grass pastures or green cereal crops. The condition can cause hyperesthesia, ataxia, seizures, sudden death, and other symptoms. Diagnosis is done by measuring blood magnesium levels, which should be above 0.65mmol/L. Treatment involves the administration of intravenous magnesium/calcium preparations, and dietary supplementation with magnesium can help prevent the condition.

Keywords: Post-parturient hypomagnesemia, grass staggers, grass tetany, metabolic disorder.

Introduction

Post-parturient hypomagnesemia is a metabolic disorder that commonly affects dairy cattle worldwide, and it is also known as hypomagnesemic tetany or grass tetany. This condition typically affects lactating cattle grazing on lush grass pastures or green cereal crops. Adult lactating animals are most susceptible because of the loss of magnesium in milk. This disorder may occur following calving, due to a decrease in blood magnesium levels, which can lead to nervous system symptoms such as agitation, muscle tremors, and possibly death.

Etiology

Postpartum hypomagnesemia is related to the overall magnesium status of the cow. Cows require high levels of magnesium during late gestation and early lactation to support fetal growth and milk. This can arise after a decrease in food intake during inclement weather, during transport, or when cows graze short-grass dominant pastures containing < 0.2% magnesium on a dry-matter



basis. Low herbage availability (< 1,000 kg dry matter/hectare) results in liveweight losses during lactation, and plasma magnesium decreases because insufficient magnesium is obtained from body tissues mobilized during loss of liveweight to support lactation. Magnesium absorption from the rumen may be decreased when potassium and nitrogen intakes are high and sodium and phosphorus intakes are low. Soils naturally high in potassium and those fertilized with potash and nitrogen (e.g., via poultry manure) are high-risk areas for hypomagnesemic tetany.

Pathophysiology

Hypomagnesemia leads to nervous system symptoms by impairing normal neurotransmitter function in the central nervous system. The decreased magnesium levels affect neurons by amplifying the release of the excitatory neurotransmitter glutamate, which can induce over-activity of muscles and cause convulsions. In cattle, hypomagnesemia can also lead to hypocalcemia, as it affects the regulation of calcium in the body. Thus, effecting multiple organ systems and their functions in the body of affected cattle.

Diagnosis

Preliminary diagnosis is done based on feeding, calving history and the diagnosis of hypomagnesemia can be confirmed with blood magnesium levels less than 1.5 mg/dL following calving, combined with clinical nervous system symptoms. Serum magnesium levels should be determined if cows show clinical signs of nervousness, muscular tremors or convulsive activity.

Treatment and Management

Treatment for post-parturient hypomagnesemia involves intravenous and subcutaneous administration of magnesium/calcium preparations. One method is to administer 400ml of 40% calcium borogluconate solution (containing 12g calcium) warmed to body temperature, by slow intravenous injection (over 5-10 minutes) into the jugular vein using a 14-gauge needle and flutter valve with the bottle held 30-40 cm above the infusion site. The most effective treatment for hypomagnesemia is intravenous or intraperitoneal administration of a 20-25% magnesium sulfate solution. Magnesium can also be administered via oral feed supplements and transdermal skin patches. Supportive therapy such as fast acting sedatives and muscle relaxants may also be given in addition. Feeding magnesium-rich supplements, such as forage, corn silage and mineral supplements that contain magnesium, can help prevent the disorder

Conclusion

Postpartum hypomagnesemia in cattle is a metabolic disorder caused by low blood magnesium levels that can lead to nervous system symptoms and death if left untreated. The disorder is preventable by feeding magnesium-rich supplements and is diagnosed based on clinical symptoms



combined with decreased blood magnesium levels. Dietary supplementation with magnesium can help prevent post-parturient hypomagnesemia. This can be achieved by topdressing hay with magnesium oxide. Additionally, ensuring that cattle have access to sufficient food and avoiding grazing on pastures with low herbage availability or high potassium and nitrogen content can also help prevent the condition. As always, a veterinarian should always be consulted for a proper evaluation and treatment of the cow.

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