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WINTER SUPPLEMENTATION OF CATTLE, PART I: GRASS TETANY

Getting cattle through the winter in good shape and good health is always a challenge. There are a number of considerations regarding feeding that I would like to take some time to discuss over the next few issues.

Fall calving herds in the foothill ranges of California can experience a metabolic disease called Grass Tetany (or hypomagnesemic tetany). This problem can occur in the southern part of the state in December and in the north, as late as April. Depending on rainfall, temperatures and other factors we either don't understand or can't predict, cattle can die rapidly due to this condition known as Grass Tetany. This is a complex metabolic disease that usually affects lactating beef cattle in California; although, it can affect younger cattle on lush pastures, range, or wheat pastures. The underlying problem is a shortage of magnesium (Mg) both in the cattle and in their diets. High levels of plant potassium (K) and nitrogen (as ammonium NH₄⁺) both interfere with Mg absorption by the animals. Therefore, fertilization with potash (K) and/or ammonium sulfate can increase plant growth and also increase the risk of Grass Tetany. The demands of lactation deplete the cow of both Mg and calcium (Ca) and the clinical signs are caused by the combined shortage of Mg and Ca in these cattle. In addition to low Mg intake (combined with higher levels of potassium and nitrogen which creates ammonia in the rumen), cattle that are consuming low levels of Ca, phosphorus, and salt are at greater risk of developing Grass Tetany.

Cattle are often found dead with evidence that they may have struggled. This is most commonly seen as grass and dirt moved away from their feet and head where they thrashed about. If found alive the cattle can be observed to have convulsions (Tetany), weakness, disorientation, and they can become belligerent and attack people or inanimate objects. Signs or symptoms of Grass Tetany can therefore be confused with rabies, Listeriosis, anaplasmosis, or a number of other conditions that affect the brain or can cause sudden death.

The diagnosis of Grass Tetany has been made easier by research done at UC Davis and other universities in the past few years. One of the diagnostic problems that has existed for some time is the accurate diagnosis of Grass Tetany in dead animals. Many cattle are simply found dead and tissue and serum Mg levels usually return to normal at or near death. However, it has been shown that the Mg concentration of fluid within the eye does not fluctuate upwards near death, so this material can be collected for many hours after death and analyzed for Mg content. The Mg concentration of this fluid can be easily interpreted to determine if the cow died of Grass Tetany. Your veterinarian can also collect cerebrospinal fluid in cases where the eyes are not available due to predation (birds that remove the eye) and these samples can also be analyzed for Mg content.

If live cattle are thought to be at risk for Grass Tetany, serum samples can be collected and analyzed for Mg. However, if Grass Tetany is highly suspected, you and your veterinarian should plan carefully for the collection of these blood (serum) samples, as the simple act of running the cattle through a chute can precipitate life-threatening convulsions. By either method, appropriate samples can be collected, analyzed, and accurately interpreted to decide if Grass Tetany is the cause of the problem.

Treatment of Grass Tetany is often accomplished by intravenous solutions of Mg and Ca. Treatment of sick animals can be very frustrating and recovery does not occur in all cases. In addition to intravenous therapy, 2 ounces of magnesium chloride or magnesium sulfate can be given in 200 ml warm water as an enema. The blood Mg levels will increase 20 minutes after the enema. This can be particularly helpful in cows that are down and convulsing or belligerent. To prevent relapses in cows treated under range conditions it has been recommended to give oral slurries of 3 ounces of magnesium oxide plus 3 ounces of dicalcium phosphate and 1 ounce of salt in 1-2 gallons of water. This can be difficult, because many of these cattle are not cooperative patients. Any treatment decisions should be carefully discussed with your veterinarian prior to implementation as individual products vary widely with respect to effectiveness and safety.

Prevention is the key to successfully handling this condition, as therapy is oftentimes not rewarding. The main goals of prevention are to achieve increased consumption of Mg and Ca through supplementation. There are a number of ways this can be accomplished. Salt-mineral mixes and molasses licks or blocks, are the most common methods that are successful. Molasses used in California often contains a large percentage of beet molasses which is relatively high in Mg. Some of the molasses supplements are excellent sources of Mg and aid in the prevention of Grass Tetany. Some molasses supplements contain urea which breaks down to NH₄⁺ in the rumen and will increase the risk of Grass Tetany. **Make absolutely certain the molasses supplement you but will help your situation not make it worse.** There are also several homemade recipes that work well for prevention and are listed below:

1:1 magnesium oxide:dried molasses

(free choice)

1:1:1:1 magnesium oxide:salt:dicalcium phosphate:corn meal

(4 ounces per head per day, minimum— mix-add more corn meal, soybean meal, etc., if less)

The main dietary goal is to supplement 1-2 ounces of magnesium oxide (or other Mg equivalent) and 1-2 ounces of dicalcium phosphate or other calcium source per animal per day. Any method that will get this done is a good method. The statement that "an ounce of prevention is worth a pound of cure" certainly holds true for Grass Tetany.

Next month we will discuss energy and protein needs for cattle in the winter and some of the important considerations for supplementation.

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