Vitamin and Mineral Focus: Magnesium

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Magnesium is a mineral that is necessary for every major metabolic pathway and plays a large role in nerve conduction, muscle function, and bone formation. Perhaps the most commonly talked about role of magnesium in the diet is its involvement in the prevention of milk fever. A positive relationship between magnesium and calcium levels exists and is necessary for proper functioning of cardiac and skeletal muscles, and nervous systems signal transmission. However, there is also negative interaction between magnesium and potassium which directly impacts calcium metabolism. High potassium dry cow diets are linked to high milk fever rates because potassium can inhibit magnesium absorption. It is also important to consider the role that magnesium has on parathyroid hormone (PTH) regulation – which again, plays a critical role in calcium metabolism. Magnesium deficiencies can make the body less receptive to PTH which consequently results in lower blood calcium levels. Magnesium, in its soluble form, is largely absorbed by the rumen epithelium. This means that the absorption of magnesium is independent of hormonal processed (unlike calcium which is regulated by PTH) and is directly related by intake. Avoiding magnesium deficiencies is an important strategy for minimizing the risk of milk fever on farm. Magnesium deficiency can be related to low magnesium content of forages – which can be prevented by fertilizing the soils if needed. Generally speaking, legumes contain more magnesium than grasses and cool weather (spring and fall) can reduce the uptake of magnesium by plant tissues resulting in lower magnesium levels in the feed. Remember, because magnesium absorption is directly dependent on feed intake, pay close attention to magnesium levels in dry cow diets especially as cows approach calving and their intake naturally declines. The NRC recommends feeding diets no higher than 0.4% magnesium, although no adverse effects are seen (other than a potential decline in intake) if diets are higher because the cow will just excrete the excess. If diets do exceed 0.4%, pay attention to intakes and if you notice low intakes, this may be an area to approach with your nutritionist.