



Florida Cooperative Extension Service

Mineral Needs of Dairy Cattle¹

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MAJOR MINERALS

Proper mineral nutrition and supplementation is essential to animal health and high levels of milk production. A lack of attention to the mineral content of the total ration frequently leads to increased disease and reproductive problems. Likewise, too great an emphasis on mineral supplements frequently leads to using a variety of costly supplements with no apparent justification.

Calcium and Phosphorus

Over 70% of the total minerals in the body are calcium and phosphorus. About 99% of the calcium and 80% of the phosphorus of the body are present in bones and teeth. Bone, therefore, not only serves as an organ of structure, but also as a reservoir of both calcium and phosphorus.

Calcium and phosphorus are closely related elements and are laid down in bone in a ratio of 2.2 parts calcium to 1 part phosphorus. This means that a deficiency or an overabundance of either mineral could interfere with the proper utilization of the other. An imbalance of either mineral can cause them to bind with each other and become unavailable to the animal. Studies have also shown that phytate phosphorus, the major form of organic phosphorus

occurring in plants, is generally available to the ruminant unless the concentration of calcium in the diet is very high. Utilization of other minerals such as magnesium may also depend on adequate calcium and phosphorus nutrition.

The importance of calcium and phosphorus in dairy rations has been recognized for several years. For a period of time, more minerals were frequently added to the ration than needed. With the adverse publicity about phosphorus getting into lakes and streams, dairymen are now more concerned about having an adequate but minimum amount of phosphorus in the ration. Fecal excretion of phosphorus does depend on the amount of phosphorus in the diet, and it has been shown that for every g/d decrease in phosphorus intake fecal excretion decreases by 0.55 g/d, while for each g/d increase, fecal phosphorus increases by 0.8 g/d.

No longer can we consider only the concentrate and ignore such important feeds as silage, hay and outside mineral mixtures. Availability of the minerals in a forage depend on forage type. As an example, studies have shown that absorption of calcium from corn silage-alfalfa hay diets was higher than when alfalfa was fed alone. Although alfalfa is higher in calcium than corn silage, calcium in alfalfa appears to resist digestion. True absorption of calcium was shown to be lower from alfalfa hay and higher from

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