

The Small Things Matter
Dr. Tania Cubitt
Performance Horse Nutrition

When feeding horses we often concentrate on the major components of the diet. Does the horse have enough pasture, hay, or even concentrate feed? When we are pressed for more details of the diet we can sometimes recall the amount of protein in the feed, but most other nutrients seem unimportant. However, it is the intake of these other nutrients, the small things, which keep horses healthy. Specifically, it is the intake of minerals and vitamins that are vital to the performance, growth, immune function and reproduction of all horses.

Minerals can be divided into two broad classifications – macro-minerals and micro-minerals, based on the amount required in the diet. Macro-minerals are required in large amounts in diet. They include minerals such as calcium, phosphorus, magnesium, potassium, sodium, chlorine, and sulfur. These minerals are vital to the development of the skeleton, muscle contraction, acid-base balance, activity of the nervous system and hoof and hair growth. The other classification of minerals is micro-minerals. These minerals are required in small amounts in the diet. They include minerals such as copper, iodine, iron, manganese, selenium, and zinc. These minerals function in most of the chemical reactions in the body helping to metabolize nutrients, maintain connective tissue and joint tissue, aid in oxygen transport to muscle and perform as antioxidants.

Vitamins are equally important in the diet of horses. Vitamins are classified as either fat-soluble or water-soluble based on how these are stored within the body. The major fat-soluble vitamins include vitamins A, D, and E. These vitamins are important for vision, calcium absorption and regulation, and as a primary antioxidant within the body protecting cells and muscle function. Fat-soluble vitamins are stored within the fat deposits of the body and can accumulate giving the potential of toxicity if overfed. The other classification of vitamins is water-soluble vitamins. These vitamins are often referred to as B-vitamins. They include thiamin, riboflavin, niacin, biotin, and folic acid. These vitamins function in nearly every chemical reaction within the body; therefore, they are critical in metabolism, growth, and energy generation. The B-vitamins are manufactured by healthy bacteria within the horse's digestive system and specific requirements have only been established for thiamin and riboflavin.

The reason many horse owners are oblivious to the vitamin and mineral content of the diet is simple – a mild deficiency of any of these minerals or vitamins is difficult to visually see in the horse. For example, a deficiency in calorie content of the diet can easily be seen as weight loss. A deficiency in protein can be seen as a rough hair coat or poor growth. But a deficiency of minerals or vitamins is much more difficult to visualize until the condition becomes quite severe. However, less obvious signs of mineral and vitamin deficiency exist if you look closely. For example, cracked, brittle hooves are often the result of zinc deficiency. A crooked legged foal could be the result of a broodmare diet deficient in trace minerals.

So how can we ensure our horses' diets are properly fortified with essential minerals and vitamins? The easiest approach is to feed a prepared feed or supplement that is properly fortified with these nutrients. It is not enough that the feed is properly fortified with nutrients, but we

must also ensure that we are feeding the product according to label directions. If we are only feeding ½ of the recommended feeding level, our horse will not be receiving the proper amount of nutrients.

Additional the source of minerals is also important – chelated minerals should be used in equine diets as they are more bio-available than inorganic minerals. Providing these minerals in a chemical form to enhance absorption is critical.

The word chelation is derived from the Greek word 'chele', meaning claw. Pronounced key-lay-shun, the chemical definition is: One substance grabs hold of another substance. More technically, the word chelation means: To firmly bind a metal (mineral) ion with an organic molecule (amino acid) to form a ring structure. The resulting ring structure protects the mineral and facilitates absorption. The body has a limited ability to naturally chelate minerals inside the stomach and intestine.

A chelated mineral that can be utilized by the body is one that has been bonded to two or more amino acids. A mineral in this “chelated state” allows easy passage through the intestinal wall into the blood resulting in increased metabolism of that mineral. In other words, when this mineral (zinc) is bound to an amino acid the combined particle (mineral plus amino acid) is perceived as food by the body, whereas the mineral itself, is not food. Your intestines are designed to allow food to pass through, but not raw (unbound) minerals.

dac® Vitamins and Minerals utilizes chelated minerals in all of their formulas to ensure increased bio-availability of nutrients and increase overall horse health.