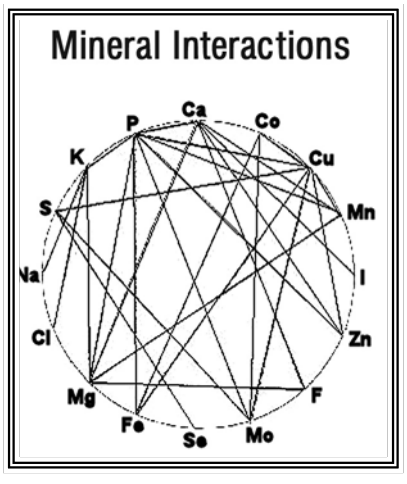
Alpaca Mineral Nutrition

By Lark L. Burnham, PhD, Ruminant Nutrition

Minerals are not one of those things where "if a little is good, more is better."

Blood mineral levels are used by many veterinarians in an attempt to measure alpaca mineral requirement. This is logical since blood is a diagnostic tool. However, there is no correlation between blood mineral levels and mineral requirement. Nutrient requirements can only be determined through extensive research involving large numbers of animals, including control groups. Blood mineral levels are only used by ruminant nutritionists when researching different mineral sources. According to the Merck Veterinary Manual, all domestic animals, including pets and livestock, have the same normal range for minerals. A comprehensive blood nutrition panel may indicate potential mineral interaction if one value is either abnormally high or low.



Until recently, ruminant nutritionists formulating diets for camelids relied on values scientifically determined as described above for cattle and sheep. Now there is a publication available that provides nutrient requirements for pseudoruminants. This publication is called **"Nutrient Requirements of Small Ruminants: Sheep, Goats, Cervids, and New World Camelids"** and is now available on amazon.com. This book is the latest in a series of publications (referred to as NRC's, after the publisher, the National Research Council) that nutritionists use to formulate diets for livestock, pets, and laboratory animals. Even if you do not formulate diets, this book is still essential for alpaca producers. It describes the symptoms of deficiencies and toxicities of all nutrients, as well as how they are used in the animal. There are tables that list recommended protein, energy, vitamin, and mineral requirements. You can compare these to the guaranteed analysis stated on your feed tags to see if you are giving enough or too much of the listed items. However, not all nutrients are listed on the feed tag guaranteed analysis.

Most protein/energy supplements intended for alpacas contain both protein and energy as well as added minerals. Unfortunately, the mineral levels are not all defined in the guaranteed analysis, although minerals may be listed as ingredients. The safest way to avoid mineral deficiencies or toxicities is to use a protein and energy supplement that does not contain added minerals, and a mineral supplement that gives a guaranteed analysis for all the major and trace minerals. A qualified ruminant nutritionist can calculate the nutrient requirements for your individual herd by analyzing hay and pasture on that farm and comparing these values to requirement as stated in the above publication. They then can formulate protein/energy and mineral supplements for your herd with this information, no blood work needed.

Having diets formulated by

Key

Ca = Calcium	Co = Cobalt
Cu = Copper	Mn = Manganese
I = Iodine	Zn = Zinc
F = Flourine	Mo = Molybdenum
Se = Selenium	Fe = Iron
Mg = Magnesium	Cl = Chlorine
Na = Sodium	S = Sulfur
K = Potassium	P = Phosphorus

a professional is probably not cost-effective for small ranches. However, several smaller ranches in the same vicinity that have similar soil or feed the same hay in dry lots can work cooperatively. Many ranches already do this with hay purchases and shearing. Professional formulation is strongly recommended for large herds, both from the standpoint of animal health and cost effectiveness.

Soil mineral content may vary even from one county to the next. Hay and pasture grown on these soils will have significantly different mineral content. Bagged feed is not formulated for any one particular area. Therefore, bagged feed may actually incur either mineral deficiencies or toxicities when fed to your animals. In addition, be aware that when gestation/lactation feeds suggest increased feeding levels after parturition, this also increases the mineral intake. Although the need for protein and energy does increase after birth, the need for most minerals does not.

Blood values are misleading and do not reveal the extent of mineral interaction occurring in the gut. Prescribing minerals on this basis can further complicate the problem and result in other deficiencies or toxicities. The accompanying diagram (see page 122) should give some indication of the complexity of mineral interaction. The minerals linked by lines indicate that one of the pair may decrease in availability when the other is increased. The use of chelated minerals, or those that are bound to organic substances such as proteins, increase availability 2 or 3 times. Look for the word "proteinate" after the name of a mineral.

About the author:

Lark Burnham received a B.S. in Animal Science (1979), from Kansas State University and a M.S. in non-ruminant nutrition (1995) from Kansas State Universtity, Manhattan, and a Ph.D. Doctorate in ruminant nutrition (2004) from Texas Tech University, Lubbock. Her special interests are comparative nutrition, the role of the micro flora in all mammals, fiber digestion, and probiotics. Lark currently works for Natur's Way. Inc., Horton, KS, which produces MSE probiotics.