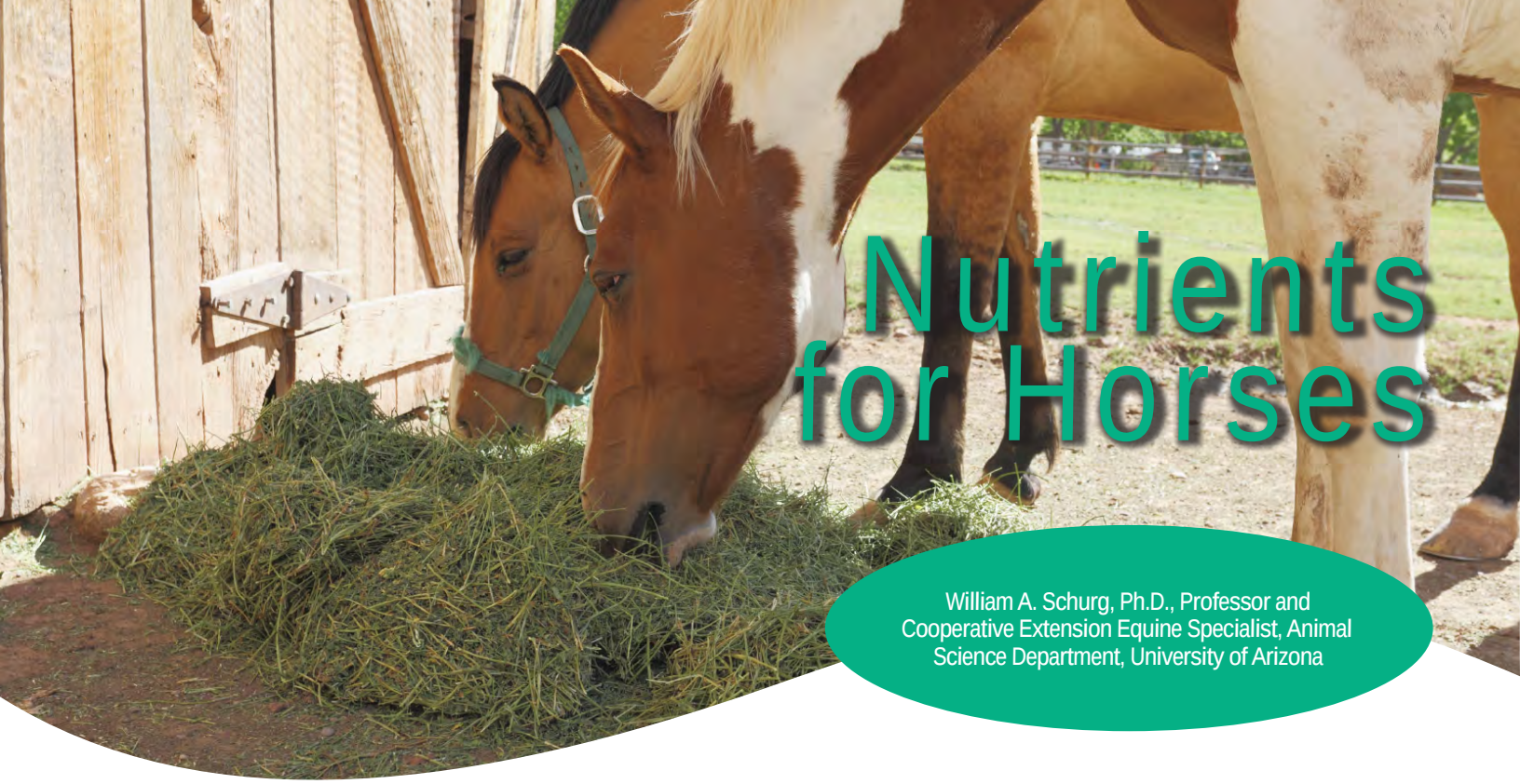

# Nutrients for Horses

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In meeting the nutritional needs of horses one must consider the actual nutrients required rather than the feedstuffs that can be utilized. As with many animals, horses eat to meet their energy needs. Generally if we can "fill the tank" with fuel the horse can maintain itself reasonably well. Forage-eaters such as equines must consume large quantities of food that is generally low in energy/mass to be able to adequately meet their energy needs. In the process, because of the large quantities consumed, adequate protein is also consumed. Thus, the general nutrients needed by the horse are water (clean, fresh and always available); energy (carbohydrates, fats and protein); protein (quality vs. quantity); minerals (macro and micro); and vitamins (fat-soluble and water-soluble).

Water is an extremely important ingredient in any feeding program. Perhaps the most critical nutrient for our working horses is one that we tend to take for granted and overlook. For frequent and prolonged physical activity of any kind, the most important nutrient a horse needs is WATER. Under severe exertion, a horse can lose up to half of this body's total protein, and virtually all of his fat reserves, before significant problems happen, however just 15% loss of his internal water supply can be fatal. Additionally, horses like all animals cannot consume adequate dry food without having adequate water intake. At rest during a normal 70 degree temperature day, a horse can be expected to consume about 4-10 gallons of water. When temperatures rise above 80 degrees the water consumption can increase 2-3X the maintenance levels. One should attempt to keep clean, fresh water available at all times under all environmental conditions. REMEMBER: Ask yourself if you'd drink the water your horse is asked to drink. If not, get him or her some clean and fresh water!!

The horse is unique to other farm animals. The horse is produced and maintained for their athletic ability, thus horse owners must supply the horse with enough energy to meet their needs. The horse must have enough fuel not only for maintenance and development, but requires extra energy for his various activities. Energy is supplied primarily from soluble carbohydrates, starches and fat from feed grains. The end product of carbohydrate digestion in the first parts of the digestive tract is glucose, while the fibrous materials like hay are broken down by microbes in the lower digestive tract and produce volatile fatty acids to augment the energy needs of the horse. Energy is necessary for proper functioning of basal metabolism, energy storage, reproduction, growth maintenance of hair coat as well as for milk and muscle. Horse owners must first provide adequate nutritional support to supply all the energy the horse needs.

Protein must be supplied in adequate amounts for proper growth and development in horses. Protein is used as source of amino acids which function in muscle growth, skeletal development, maintenance and repair of body tissues, and hormone production. It should be pointed out that the protein in creep or young growing horse diets should be present in a larger percentage and it should have an excellent balance of essential amino acids, especially lysine, methionine and tryptophan. The amino acid threonine will be also important when the feeding program is based upon grass forage. Mature horses can be fed smaller dietary percentages with lessor regard to essential amino acids but again balanced diets are essential.

Minerals should be included in the diet in both adequate and balanced amounts. They are essential for normal development, and are involved in a number of important functions including: electrolyte balance, nerve impulse transmission, energy utilization and maintenance of soft tissues, to name a few. There are 13 minerals essential for life and under Arizona conditions, seven of these are of primary concern. They are calcium, phosphorus, iodine, copper, zinc, sodium and chlorine. During the hot summer months salt requirements are greater than any time during the year. It is important that salt is added daily to the horse's diet. We have found that many horses will not consume enough additional salt from the block form, so adding about a tablespoon of loose trace mineralized salt is recommended. Since the bulk of Arizona horse feeding comes from

alfalfa hay use, feeding supplements to assist in the balance of calcium, phosphorus, copper and zinc is essential. This balance is especially important when feeding young growing horses as skeletal development can be altered if the diet is not adequately balanced. Vitamins for the most part are not usually needed in added amounts when a normal balanced diet is fed. However, of the fat soluble vitamins it is important to make sure that the horse receives adequate levels of Vitamin A. Vitamin D is not normally a problem as long as the horse has access to daylight. In recent years the level of Vitamin E has been low in some forages in our state, so the status of this vitamin needs to be understood. Vitamin K and the water soluble vitamins C and the B complex all under normal maintenance situations should not need to be added to the diet. However, under heavy stress situations, the water soluble vitamins can provide added benefit.

Horse owners have many options when it comes to feeding techniques. Because the activity of individual horses vary tremendously (much more than with other large domestic animals). There are five major factors that regulate the kind and amount of nutrients required by an individual horse. These are: maintenance, growth, reproduction, lactation and exercise. Every animal's nutrient needs are dependent upon the type of exercise or the purpose for which he/she is being used. It is also advisable to know the approximate age, weight and body condition of your horse. The nature of the feeds available and the chemical composition of those feeds is critical to understand in order to effectively feed a balanced diet that will meet the nutrient needs. One must remember that every horse cannot be fed in a similar fashion. Young growing horses will have very different requirements than an older, mature animal or a lactating mare.

Horse owners with sound information regarding digestive physiology, nutrients and requirements, various classes and unique feeding management practices and many of the common feeds and their compositions should be well equipped to evaluate nutritional practices.