

**TEXAS A&M UNIVERSITY
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EQUINE SCIENCES PROGRAM**



FEEDING THE MATURE IDLE HORSE AT MAINTENANCE

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The basic concept in designing a sound feeding program for horses is to 1) know the nutrient requirements of the various classes, 2) know the nutrient composition of the feedstuffs available for feeding and 3) combine the feedstuffs into a ration(s) that meet the horse's requirements in the safest, simplest and most economical fashion. When formulating horse rations and preparing educational materials, equine nutritionists, County Extension agents and feed company technical representatives utilize the research based publication, Nutrient Requirements of Horses¹. From this publication, example feeding programs and example concentrate rations to mix and feed with different types of forage, have been developed for horsemen. Some horsemen are formulating their own concentrate rations. Other horsemen are feeding different weight horses (i.e. miniature to draft). In these cases, horsemen need to be skilled in utilizing the Nutrient Requirements of Horses Publication. This paper first briefly discusses utilizing the NRC publication, then focuses on feeding one example class of horse, the mature horse at maintenance.

Utilizing the NRC Publication

In Nutrient Requirements For Horses, section five titled Nutrient Requirement Tables, provides 7 tables with information on the Daily Nutrient Requirements of Ponies (440 lb.) through various weights of Horses (880, 1100, 1320, 1540, 1760 and 1980 lb.) Section five also contains two tables, Nutrient Concentrations Required in Total Diets For Horses and Ponies. One of these tables expresses requirements on a "dry matter basis", which means that the feedstuffs are 100% dry. A second table

expresses feedstuffs on an as fed basis, which means that the feedstuffs contain about 10% moisture and 90% dry matter. Generally, the as fed table is utilized to determine requirements when most traditional horse feedstuffs are fed; the dry matter table when higher moisture content feedstuffs are utilized. For example, 20 lbs. of total daily feed "as fed", with a moisture content of 10%, is equal to 18 lbs. of feed on a "dry matter basis". Nutrient concentrations required in the total diet will vary with the level of feed intake, but the figures assume an average feed intake of approximately 2% of body weight. (Note: Table 5.4 lists the Expected Feed Consumption by horses (% body weight) of various classes.) Rations for horses should be formulated such that a horse does not have to eat more than 2.5% of body weight. Within each requirement table, requirements are listed for horses at maintenance, breeding, working or growing. Horses require over 30 specific nutrients in their diets; the tables list the requirements for energy, protein lysine, calcium, phosphorus, magnesium, potassium and Vitamin A. In formulating rations, nutritionists formulate to meet the major quantitative nutrients which are energy, protein, calcium, phosphorous and Vitamin A. When these nutrient requirements are met with high quality feedstuffs, generally, all other requirements are also met.

Feeding The Mature Horse at Maintenance

The tables below list the nutrient requirements for energy, protein, calcium, phosphorous and Vitamin A of an 1100 lb. mature horse at maintenance, from Nutrient Requirements of Horses. Table 1 is Daily Nutrient Requirements (1100 lb.). Table 2 is

Nutrient Concentrations in The Total Diet (As Fed Basis).

Energy is expressed in megacalories (Mcal) of digestible energy (DE). A calorie is a term used to measure combustible energy in feeds and relates to the amount of "physiological fuel" in the feed. A megacalorie is one million calories. Digestible energy is the usable amount of energy from the feed after digestion. Note in Table 1 that the mature 1100 lb. horse at maintenance requires 16.4 Mcal of DE per day, which translates into a diet containing about 0.8 Mcal/lb (Table 2.). [Note: Occasionally the term TDN (total digestible nutrients) is used when expressing energy requirements or energy content of feedstuffs. One lb. of TDN is equivalent to approximately 2 Mcal of DE.]

Table 1. Daily nutrient requirements of horses (1100 lbs.)^a

DE (Mcal)	CP (lb.)	Ca (grams)	P (grams)	Vit. A (1000 IU)
16.4	1.4	20	14	15.0

^a Adapted from NRC (1989).

Table 2. Nutrient Concentrations in the total diet (As Fed Basis)^a

DE (Mcal/lb)	CP (%)	Ca (%)	P (%)	Vit. A (IU/lb)
16.4	1.4	20	14	15.0

^a Adapted from NRC (1989).

Protein requirements are expressed as actual pounds of crude protein required daily or as crude protein required as a percent of the total diet. Note (table 1) that the mature 1100 lb. horse at maintenance requires 1.4 lb. of protein per day which is approximately 7.2% crude protein in the total diet (table 2). Feeds differ in protein digestibility. For example, about 70% of the crude protein in legumes and mixed rations is digestible while the protein digestibility of grass forage is about 50%.² The crude protein requirement is the estimated total amount of protein required, assuming average digestibility of all feeds.

With all classes of horses, small

quantities of calcium and phosphorus are required, compared to the required quantities of energy and protein; therefore, these minerals are measured in grams rather than in pounds. Table 1 shows the daily calcium and phosphorus requirement of the mature 1100 lb. horse at maintenance to be 20 grams and 14 grams, respectively. This translates into about .21% calcium and .15% phosphorus in the total ration as is shown in table 2. Calcium and phosphorus are generally considered together because they are required together for the formation and maintenance of bone. The average ratio of calcium to phosphorus in body tissues is generally from 1.5:1 to 2:1; therefore, it is important to supply these minerals in about this same proportion in the diet. Wider ratios of calcium to phosphorus can be tolerated, however, in no case should rations contain more phosphorus than calcium.

Several vitamins are required by the horse and most vitamins are present in adequate amounts, in traditional horse diets, with the exception of Vitamin A. Horses normally consume sufficient carotene, the Vitamin A precursor, from eating green growing forages or from fresh hay. However, carotene is unstable in sunlight and at high temperatures, which means that weathered hay and older hay (over 6 months of age) will contain little to no Vitamin A activity. Adding to this situation is the fact that of the cereal grains traditionally fed to horses, corn is the only one containing carotene. Horses receiving feeds rich in carotene can produce and store a 3 month supply of Vitamin A in the liver, but this supply is depleted during times of low carotene intake. For these reasons, synthetic Vitamin A should be added to complete horse feeds, supplements, additives, etc. to provide the levels shown in tables 1 and 2. Vitamin A is measured in International Units(IUs). The mature 1100 lb. horse at maintenance requires 15,000 IU per day (table 1) which translates into about 750 IU/lb. of daily feed intake (table 2).

In summary, the mature horse at maintenance has comparatively low nutrient requirements when compared to growing horses, work horses, and broodmares. The 1100 lb. horse can comfortably consume 2.0-2.5% of his body weight in feed. Generally, mature idle horses can be maintained on good quality

pasture or hay with free choice access to TM salt and water. When pastures or hays are of questionable quality, the mature idle horse should be fed 0.5-1.0% of his body weight of a concentrate feed (ie. 8-10% CP) which will provide the nutrients not provided by the forage. Obesity can be a problem with the idle horse due to possible overfeeding and lack of exercise. Mature idle horses should be maintained at a condition score of 4-5.³

References

1. National Research Council. 1989. Nutrient Requirement of Horses. Fifth Revised Edition. National Academy Press, Washington, D.C.
2. Gibbs, P.G. G.D. Potter, G.T. Schelling, J.L. Kreider and C.L. Boyd. 1988. Digestion of hay protein in different segments of the equine digestive tract. J. Ani.Sci. 66. p. 400-406.
3. Henneke, D.R., G.D. Potter, J.L. Kreider and B.F. Yeates. 1983. Relations between condition score, physical measurements and body fat percentage in mares. Equine Vet. J. 15(4). p. 371-372.

A copy of the publication "Nutrient Requirements of Horses" may be purchased directly from the NRC at the National Academy Press, 2101 Constitution Avenue, N.W., Washington, DC, 20418. The publication contains a user friendly floppy computer disc for use on any IBM or IBM compatible computer. (Note: Horseowners can plug in the age, size, sex and activity level of any horse and that horses nutrient requirements are displayed on the screen.) Enclose a money order for \$17.95 (U.S. funds) including shipping charges. Alternatively, orders can be placed by phone with a major credit card to their toll free number: 1-800-624-6242. Orders are delivered by UPS in 5 to 7 days. Copies may also be available at college and university bookstores in cities where equine courses are offered.

