FO-00480 Revised 1995

To Order

Horse Nutrition and Feeding

Nutritional Needs of a Horse

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Every horse owner should understand a horse's needs and what affects those needs. The four basic nutrient groups—carbohydrates, protein, minerals and vitamins—are all required in varying amounts by horses for maintenance (horse at rest), work (riding), pregnancy, lactation, and growth.

The best source of horse nutrition information is the National Research Council. The council's recommended requirements are the studied judgments of a committee of respected horse nutritionists. The recommendations in this bulletin are based on information provided through the National Research Council.

Horse owners use several guidelines to determine how much feed and what kind of feed their horses need. It may be so many flakes of hay or scoops of grain per horse; it may be a particular ratio of hay to grain, or it may be a percent of a certain nutrient in the grain ration. For vitamins, horse owners figure so many units per horse daily or so many units per pound of grain. Minerals are provided as a percent of the total diet or grain mix, and energy is provided as pounds of total digestible nutrients (TDN) or calories per head daily. When horse owners think of protein, it's so many pounds per head daily or a percent of the grain ration.

While the horse owner may think in terms of units per pound or percentages, the horse has a specific daily requirement for a given amount of a nutrient. While 30 pounds of feed that contain .3 percent calcium may provide an adequate intake of calcium, 15 pounds of a high-grain ration containing .3 percent calcium would provide only half enough. Therefore, saying that a horse requires .3 percent calcium or 10 percent protein in its ration doesn't tell you much. It's the amount fed times the concentration of the nutrient that determines whether a specific daily requirement will be provided. It may not be necessary to weigh each day's ration, but one should know how much a half pail or pail full of grain weighs, or what a typical flake of hay weighs.

Table 2 shows the concentration of energy (TDN), or proportion of grain to hay to feed. It also indicates

the percent of protein and minerals or units of vitamin A to include in rations that should be fed horses and ponies at various stages of production.

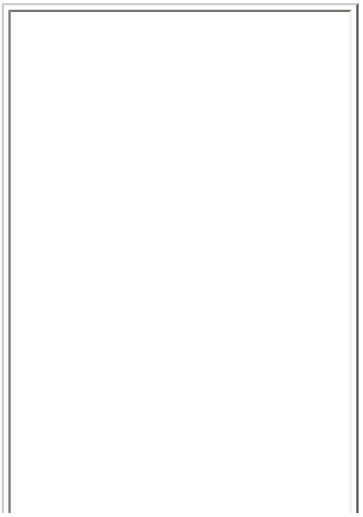
Table 2. Nutrient Concentration in Diets for Horses and Ponies[1]

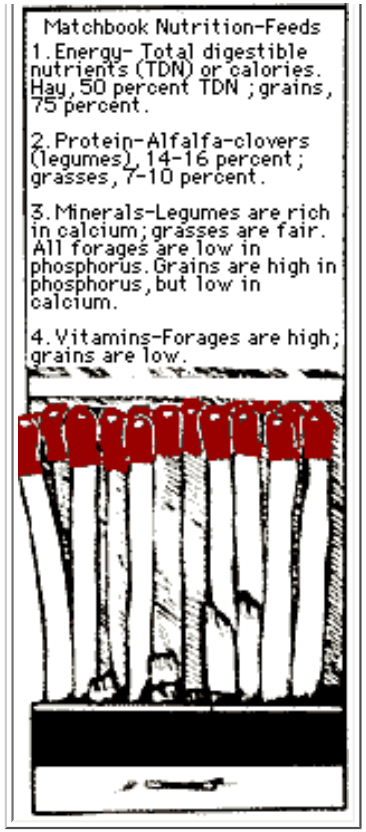
	Diet Proportions							
	Digestible energy Mcal/lb	**Total digestible nutrients %**	**Concen-trate %**	**Roughage %**	**Crude protein %**	**Calcium %**	**Phosphorus %**	**Vitamin A activity IU/lb**
Maintenance	1.0	50	0	100	7.2	.21	.15	750
Gestation								
9 months	1.1	54	20	80	8.9	.39	.30	1510
10-11 months	1.2	56	30	70	9.5	.41	.30	1490
Lactation								
First 3 months	1.2	60	50	50	12.0	.47	.30	1130
3 months to weaning	1.1	57	35	65	10.0	.33	.20	1240
Foal, 4 months	1.3	64	70	30	13.1	.62	.34	650
Weanling, 6 months	1.25	64	70	30	13.0	.50	.28	760
Yearling, 12 months	1.15	62	60	40	11.3	.39	.21	890
Yearling, 18 months	1.10	59	45	55	10.8	.32	.18	930
2-year-old, light training	1.10	60	50	50	10.1	.31	.15	840
Mature working horses[2]								

Light work	1.1	57	35	65	8.8	.27	.20	1100
Moderate work	1.2	60	50	50	9.4	.28	.20	970
Intense work	1.3	65	65	35	10.3	.31	.20	800

Adapted from NRC "Nutrient Requirements of Horses," 1989.
[1]Diets containing 90% dry matter.
[2]Light work: western, pleasure, equitation
Moderate work: ranch work, barrel racing, jumping
Intense work: racing, polo, hunting

The first requirement for all nutrients is that they maintain the horse. If a horse is to work, reproduce, and suckle young, additional feed or, more logically, greater concentration of nutrients beyond the maintenance requirements must be provided **(Table 2)**. The stage of production (lactation, work, etc.) determines what nutrient(s) must be increased and to what degree. For example, riding a horse 2–3 hours a day (light work) increases the animal's need for energy about 30 percent over maintenance, and 4–5 hours of normal riding increases energy needs 65–70 percent. Even more striking, when ridden hard (for polo, jumping, etc.) a horse may use as much energy in one hour as he requires for 24 hours of maintenance and six times more than for light work. However, protein requirements do not increase significantly with exercise. A mare during the last quarter of her pregnancy needs about 20 percent more protein than she requires for maintenance, but her energy requirement increases only slightly.





Without exception, all these examples call for greater nutrient concentrations in the diet as shown in **Table 2**. Don't attempt to memorize all the figures, but do remember the major points such as: work doesn't increase protein needs; lactation is a critical time for all nutrients, etc.

To determine the specific amount of a nutrient your 1100-pound horse needs and how to provide it, use the ration concentration data from **Table 2** and the amount of daily feed from **Table 3** to arrive at the specific daily amounts of nutrients required. **Table 3** is an excellent guide, but horse feeding still involves some art. Individual horses vary considerably and should be fed accordingly. To accommodate for deviation, horse owners may have to provide 10-15 percent more nutrients than the amounts given in **Table 3**.

Table 3. Daily Feed and Nutrient Requirements of 1100-pound Horse at Various Production Stages

	Weight lb	Daily Grain lb	Daily Feed lb	Concen-trate %	Rough-age %	Digestible Energy Mcal	TDN lb	Crude Protein lb	Calcium g	Phos-phorus g	Vitamin A 1000 IU/ lb Body Wt.
Maintenance	1100	0	16.4	0	100	16.4	8.2	1.4	20	14	15
Gestation, Last 90 Days	1200	1.2	16.8	25	75	18.4	9.2	1.8	35	23	30
Lactation, First 3 Months, 33 lb Milk	1100	0	23.9	50	50	28.3	14.1	3.1	56	36	30
Lactation, 3 Months to Weaning, 22 lb Milk	1100	0	22.3	25	75	24.3	12.2	2.3	36	22	30
Suckling Foal, 3 Months	340	2.6	-	75	25	14.0	7.0	1.7	33	20	8
Weanling Foal, 6 Months	475	1.8	13.8	70	30	17.2	8.6	1.7	36	20	10
Yearling, 12 Months	715	1.3	15.8	50	50	19.0	9.5	1.9	34	19	15
Long Yearling, 18 Months	880	.8	15.1	40	60	20.0	10.0	2.0	36	20	18
Two-year-old	990	.44	14.5	30	70	20.0	10.0	1.8	24	13	20
Two-year-old In Training	1000	.44	14.5	50	50	26.3	13.2	2.5	34	19	20

Tables of this type have been worked out for horses of various weights. For brevity's sake, only the nutrient requirement for an 1100-pound horse is presented. **Table 3** shows that the energy requirement of an 1100-pound mare during the last quarter of gestation amounts to only 1 pound more TDN (2 pounds of

hay equivalent) than the amount required to maintain a non-pregnant mare of the same weight. Proper nutrition for horses is especially vital during lactation and early growth. Note that the amount of protein needed during lactation is twice that required for maintenance (3.0 pounds vs. 1.4 pounds), and that considerably more TDN is required for lactation than for pregnancy (14.1 pounds vs. 9.2 pounds). Calcium and phosphorus needs also are more critical for lactation and growth. Vitamin A requirements during the last quarter of pregnancy are twice those needed for maintenance or for light work, and calcium and phosphorus requirements are likewise increased during lactation.

Two big eaters—the smaller overo yearling needs a ration more concentrated in nutrients (12 percent protein and 40-50 percent grain) due to her age and smaller amount of feed capacity. The big eight-year-old Shire x TB gelding has reached his mature size, has great feed capacity and is less energetic. Obviously he needs more feed daily than the overo, but could exist largely on good quality hay.

You may be dismayed at the number of values given in the tables, but if you are concerned with an 1100-pound horse during only one stage of production, the figures should not be overwhelming. If all horse owners consistently fed corn and timothy always of the same quality, we would utilize very simple tables. Because the kind and quality of feeds used vary tremendously, and a given-size horse is expected to perform a specific task and therefore has definite nutrient requirement, we need tables to provide information about those requirements and what feeds will best supply them.

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