AGRICULTURAL

MU Guide

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Feeding Horses

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In balancing rations for horses, the goals are to furnish horses with a daily supply of nutrients in the correct amounts to prevent digestive upsets and to use feedstuffs that are palatable, easily obtained and economical.

Horses are, by nature, consumers of forage. Under natural conditions, they spend several hours a day grazing. Basing rations on adequate amounts of good quality roughage will minimize digestive disturbances such as colic. We can supplement hay or pasture with the correct amount of the right concentrates to meet requirements for energy, protein, minerals and vitamins.

Determining correct nutrient levels

Feeding horses is both an art and a science. Individual horses vary considerably in their nutrient requirements, but a table of these requirements forms a useful basis for formulating rations.

All horses require nutrients to maintain body weight and to support digestive and metabolic functions. In some cases they need additional nutrients for growth, work, reproduction or lactation.

Tables of nutrient requirements for horses are expressed in two ways:

- Daily nutrient requirements.
- Nutrient concentration in the feed. This may be expressed on an as-fed basis or on a dry-matter basis.

Most horses receive their daily ration in two parts: roughage (hay or pasture) and concentrates. The concentrate portion contains grain and may include a protein supplement, minerals and vitamins. It may also include bran, cane molasses, dehydrated alfalfa or other feedstuffs.

Our problem, then, is as follows:

- To decide how much and what kind of roughage to feed.
- To decide on the correct concentrate mixture and the amount of it we need to supply the nutrients not present in adequate amounts in the roughage.

Roughage for horses

Adequate amounts of roughage in the ration decrease the risk of colic and laminitis. Roughage also helps maintain the correct calcium-to-phosphorus ratio, because grain is low in calcium and because roughages — especially legumes — are high in calcium. Rations should always contain more calcium than phosphorus. Calcium:phosphorus ratios between 1.1:1 and 2:1 are within an acceptable range. Even higher calcium levels can be tolerated; but when phosphorus levels are higher than calcium, severe skeletal abnormalities may result.

Adequate hay in the ration of horses kept in stalls also is beneficial because they eat it over a longer time span than grain. It aids in preventing vices such as wood chewing, which horses do when bored or when they lack roughage.

A good rule of thumb is to feed at least 1 pound of hay per day for every 100 pounds body weight of the horse. A 1,000-pound horse would be fed about 10 pounds of hay per day. Mature, idle horses in good condition, fed excellent hay in increased quantities (about 2 pounds per 100 pounds of body weight) may do well without grain added to their ration. Growing or working horses, mares during late pregnancy and mares during lactation need grain and other concentrates in addition to the roughage.

Alfalfa, red clover and lespedeza are examples of legume hays you can feed to horses. Brome, orchardgrass and timothy are examples of nonlegumes (grasses).

Fescue hay infected with the endophyte fungus *Neotyphodium coenophialum* causes reproductive problems in mares if fed during late pregnancy. It is also low in energy unless it is harvested before it becomes mature. If harvested before it gets too mature, however, it usually works for mature geldings or open mares, providing they have adequate supplementation.

Concentrates for horses

Historically, oats have been the first choice of feeds. Oats are medium in energy, require little or no processing and have more protein than most grains. However,

Table 1. Daily nutrient needs, 1,100-pound mature weight (as-fed basis).

Class	Digestible energy (DE)	Crude protein (CP)		Calcium (Ca)		Phosphorus (P)	
	Mcal	percent	pounds	percent	grams	percent	grams
Mature horses at maintenance	16.40	7.20	1.44	0.21	20	0.15	14
Mares, last 90 days of gestation	18.50	9.00	1.80	0.39	35	0.30	27
Lactating mare, first 2 months	28.30	14.00	3.14	0.50	56	0.40	36
Lactating mare, 3 mo. to weaning	24.31	12.00	2.31	0.47	36	0.30	22
Creep feed (supplemental)		16.00	–	0.80	32	0.50	20
Weanling – 4 mo.	14.40	13.10	1.59	0.62	34	0.34	19
Weanling – 6 mo.							
Moderate growth	15.00	13.00	1.65	0.55	29	0.28	29
Rapid growth	17.20	13.10	1.89	0.55	36	0.30	20
Yearling – 12 mo.							
Moderate growth	18.90	11.30	1.87	0.48	36	0.21	29
Rapid growth	21.30	11.30	2.10	0.48	40	0.22	34
Long yearling – 18 mo.							
Not in training	19.80	10.10	1.97	0.31	27	0.17	15
In training	26.50	10.80	2.63	0.32	36	0.18	20
2-year-old							
Not in training	18.80	9.40	1.76	0.31	24	0.17	13
In training	26.30	10.10	2.46	0.32	34	0.18	19
Mature working horses							
Light work	20.50	8.60	1.81	0.30	25	0.19	18
Moderate work	24.60	8.60	2.17	0.30	30	0.22	21
Intense work	32.80	8.60	2.89	0.30	40	0.23	29

Source: Adapted from Nutrient Requirements of Horses, Fifth Revised Edition. Committee on Animal Nutrition, National Research Council, 1989.

they are variable in energy content. You should avoid oats with a light weight per bushel because of their low energy and high fiber content. The best oats usually come from the north central states such as Minnesota, North and South Dakota and northern Iowa.

Corn is fine for feeding horses, but is highly concentrated in energy. You must take care not to overfeed it. Wheat and grain sorghum (milo) are less suitable for feeding horses. Wheat is especially dangerous because it causes colic by impacting in the gastrointestinal tract.

A 50:50 ratio of corn and oats combines the safety of oats with the economy of corn. It is often recommended for horses.

Some horse feeding/management recommendations

- Feed only quality feeds.
- Feed balanced rations.
- Feed half the weight of the ration as quality hay.
- Feed higher protein and mineral rations to growing horses and lactating mares.
- Feed legume hay to young, growing horses, lactating mares and out-of-condition horses.
- Use non-legume hays for adult horses doing light work or no work.
- Regulate hay-to-grain ratio to control condition in adult horses.
- Feed salt separately, free-choice.
- Feed a free-choice mineral mix unless minerals are included in the concentrate mix.
- Keep teeth functional. Horses 5 years old and older should be checked annually by a veterinarian to see if their teeth need floating (filing).
- See that stabled horses get exercise. Horses will eat better, digest food better and be less likely to colic.
- Feed according to the individuality of horse. Some horses are hard keepers and need more feed per-unit of body weight.
- Feed by weight, not volume. A gallon of different grains may vary 100 percent in nutrient yield.
- Minimize fines in a prepared ration. If a feed is ground fine, horses will be reluctant to eat it and the chances of colic will increase.
- Offer plenty of good water, no colder than 45 degrees F. Free-choice water is best. Horses should be watered at least twice daily.
- Change feeds gradually. When changing from a low-density (low-grain), high-fiber ration to one of increased density, change gradually over a period of a week or more.
- Start on feed slowly. Horses on pasture should be started on dry feed gradually. Start this on pasture if practical and gradually increase the feed to the

Ration No. 1. Foal creep ration (MU tests).

Crude protein = 18% Calcium = 0.88% Phosphorus = 0.60%

Ingredients	½ ton	1 ton
Oats, crimpled or crushed	440	880
Corn, coarsely cracked	220	440
Soybean meal, 44 percent	240	480
Molasses, liquid	70	140
Dicalcium phosphate	15	30
Limestone	10	20
Salt, trace mineral	5	10
Vitamin premix[1]	1	2
Total, pounds	1,001	2,002

[1]A premix furnishing 8 million I.U. of vitamin A, 1 million I.U. of vitamin D and 150,000 I.U. of vitamin E per ton of feed.

Please note:

Feed this grain ration free-choice with good legume hay to foals from two weeks of age to weaning or to early weaned foals from 3 to 8 months of age.

Do not continue weaned (or older) foals on this feed because it is too high in protein and calcium unless fed with non-legume hay up to a year of age at which time (or sooner) it should be replaced with MU Ration No. 2 for weanlings.

Be sure preparation of the ration does not result in dust or "fines."

Ration No. 2. Weaning horse ration (MU tests).

Crude protein = 16.31% Calcium = 0.75% Phosphorus = 0.55%

Ingredients	½ ton	1 ton
Oats, crimpled or crushed	440	880
Corn, coarsely cracked	270	540
Soybean meal, 44 percent	190	380
Molasses, liquid	75	150
Dicalcium phosphate	10	20
Limestone	5	10
Salt, trace mineral	5	10
Vitamin premix[1]	1	2
Total, pounds	1,001	2,002

[1]A premix furnishing 8 million I.U. of vitamin A, 1 milliion I.U. of vitamin D and 150,000 I.U. of vitamin E per ton of feed.

Please note:

Feed this grain ration to weanlings. Add good legume or at least half legume hay at 1 to 1½ pounds of grain per 100 pounds of body weight. Feed hay free-choice.

Do not stuff weanlings with 15 to 20 pounds of any grain feed.

If you "cut" this ration by feeding half oats or half corn with it, the level of calcium will be too low unless excellent alfalfa hay is fed free-choice.

Change to MU Ration No. 3 by 14 to 16 months of age for better growth and economy.

Ration No. 3. Yearling, 2-year-old, late pregnancy and lactating mare ration (MU tests).

Crude protein = 14.3% Calcium = 0.61% Phosphorus = 0.43%

Ingredients	½ ton	1 ton
Oats, crimpled or crushed	440	880
Corn, coarsely cracked	340	680
Soybean meal, 44 percent	130	260
Molasses, liquid	70	140
Dicalcium phosphate	5	10
Limestone	10	20
Salt, trace mineral	5	10
Vitamin premix[1]	1	2
Total, pounds	1,001	2,002

[1]A premix furnishing 8 million I.U. of vitamin A, 1 million I.U. of vitamin D and 150,000 I.U. of vitamin E per ton of feed.

Please note:

Feed this ration at the beginning of the yearling year with good legume or at least half legume hay or good pasture. Regulate intake to control the desired degree of condition. Four to eight pounds daily should suffice.

As growing horses approach 18 months of age, non-legume hay is sufficient with adequate grain to maintain condition.

Feed mares in late pregnancy and early lactation 6 to 10 pounds of grain as needed to regulate condition and sustain good milk production. If no pasture is available, feed good mixed hay free-choice.

If mares are obese in late pregnancy, they need no grain but may be maintained on quality legume or mixed or nonlegume hay.

Ration No. 4. Adult horse, early pregnancy and late 2-year-old ration (MU tests).

Crude protein = 11.0% Calcium = 0.43% Phosphorus = 0.36%

Ingredients	½ ton	1 ton
Oats, crimpled or crushed	500	1,000
Corn, coarsely cracked	390	780
Soybean meal, 44 percent	30	60
Molasses, liquid	65	130
Dicalcium phosphate	3	6
Limestone	7	14
Salt, trace mineral	5	10
Vitamin premix[1]	1	2
Total, pounds	1,001	2,002

[1]A premix furnishing 8 million I.U. of vitamin A, 1 million I.U. of vitamin D and 150,000 I.U. of vitamin E per ton of feed.

Please note:

This ration is designed for adult and 2-year-old idle and working horses and for mares until the last three months of pregnancy. It may be fed with either legume or non-legume, but non-legume hay will result in fewer digestive upsets with hard working horses consuming large amounts of grain.

This ration is too low in protein, calcium and phosphorus for weanlings and lactating mares and is marginal in these nutrients for mares in late pregnancy (see Rations 2 and 3).

desired amount in a week to 10 days.

- Do not feed grain until tired or hot horses have cooled and rested, preferably one or two hours. Instead, feed hay while they rest in their blankets or are out of drafts.
- Feed before work. Hungry horses should finish eating at least an hour before hard work.
- Feed all confined horses at least twice daily. If horses are working hard and consuming a lot of grain, three times is mandatory.
- When feeding hay, give half the hay allowance at night, while horses have more time to eat and digest it.

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