

DEFICIENCIES IN HORSES

ETIOLOGY

The main cause of deficiency is malnutrition or underfeeding. The horse is simply not getting enough or not at all of one or more nutrients, be it calories, protein, minerals or vitamins.

All horses that do not require feed, or receive less than the manufacturer's recommended amount, should receive at least one supplement of minerals and vitamins.

Other factors can also interact with nutrient absorption, such as excess of iron or sulfur in the water, which can block the absorption of trace elements.

Certain foods or plants can also decrease the absorption of nutrients, such as horsetail and eagle fern which cause vitamin B deficiency, or whole soy bean and its antitryptic effect.

SYMPTOMS

- Lack of energy, apathetic, little resistance to work
- Poor hoof quality (cracking hooves, soft sole, slow growth)
- Dull, unkempt coat, poor shedding, poor quality and grows hair
- Deficient muscle mass
- Low body condition scoring
- Predisposition to rhabdomyolysis
- Deficient immune system
- Reproduction issues (lack/decreased fertility, death of the foal due to white muscle disease, etc.), growth (bones' formation, contractures of tendons, OCD, etc.) and performance (lack of resistance, poor recovery after exercise, etc.).

DIETARY RECOMMENDATIONS

Serve quality hay in sufficient quantity, containing a good level of calories and protein and low in lignin in order to help the body condition and muscle mass.

- Hay cannot provide all the nutrients essential to the health and survival of the horse.

In Canada, it contains no selenium, low trace-elements and quickly loses its vitamin content after mowing

- To supplement hay, a feed will be served to increase the amount of calories and protein served as needed.
- A supplement will be served to increase the content of minerals, vitamins and / or protein
- Serving a well-balanced ration as needed throughout the year will prevent variations in its health status
- In addition to the amount of minerals and vitamins served, the ratios between the different minerals must be respected in order to avoid bad interactions.

For example, the Ca/P ratio should be around 2/1 for foals, and between 1/1 and 5/1 in adults, while the Zn/Cu ratio should be around 3/1.

- Serve quality hay in sufficient quantity, which means that the horse should receive a minimum of 1.5% of its weight per day in long fiber (at least $\frac{3}{4}$ " or 2 cm). On average, horses consume 2.5% of their weight per day.
- Have the hay analyzed, in order to know its content and balance the rest of the ration according to the result and the horse's needs.
- Serve calories, protein, minerals and vitamins depending on the horse's weight, body size, muscle mass, level of exercise and life stage (foal, broodmare, etc.)
- Offer a balanced ration throughout the year, and adjust it quickly if the requirements are changing
- Make any feed change gradually over a 7 to 10 days period.
- Offer source of salt (NaCl) daily as well as plenty of fresh and clean water at all times.
- Daily ration should be divided into 2 and preferably 3 separate feedings or more.
- Use a scale to weigh the feed so you know exactly how much the horse is being fed. Do not feed by volume.

DAILY REQUIREMENTS FOR A HORSE AT MAINTENANCE LEVEL (OR LIGHT EXERCISE)

MINIMUM REQUIREMENTS ACCORDING TO THE NRC GUIDE (2007)

Horse's weight	Selenium	Vitamin A	Vitamin D	Vitamin E	Zinc	Copper	Manganese
400 kg	0.8 mg	12 000 UI	2 640 UI	400 UI	320 mg	80 mg	320 mg
450 kg	0.9 mg	13 500 UI	2 970 UI	450 UI	360 mg	90 mg	360 mg
500 kg	1 mg	15 000 UI	3 300 UI	500 UI	400 mg	100 mg	400 mg
550 kg	1.1 mg	16 500 UI	3 630 UI	550 UI	440 mg	110 mg	440 mg
600 kg	1.2 mg	18 000 UI	3 960 UI	600 UI	480 mg	120 mg	480 mg

SUPERIOR REQUIREMENTS ACCORDING TO THE MOST RECENT RESEARCH

Horse's weight	Selenium	Vitamin A	Vitamin D	Vitamin E	Zinc	Copper	Manganese
400 kg	1.6 mg	12 000 UI	2 640 UI	440 UI	512 mg	128 mg	480 mg
450 kg	1.8 mg	13 500 UI	2 970 UI	495 UI	576 mg	144 mg	540 mg
500 kg	2 mg	15 000 UI	3 300 UI	550 UI	640 mg	160 mg	600 mg
550 kg	2.2 mg	16 500 UI	3 630 UI	605 UI	704 mg	176 mg	660 mg
600 kg	2.4 mg	18 000 UI	3 960 UI	660 UI	768 mg	192 mg	720 mg

In addition to the minimum or superior amounts of minerals and vitamins to be served, it is important to respect certain ratios as mentioned, especially in growing foals.

Indeed, a ratio of 2/1 must be respected for the Ca/P.

For adult horses, the ration can go from 1/1 to 5/1.

For Zn and Cu, the ratio should be as close to 3/1 as possible.

SUGGESTED PURINA PRODUCTS

Recommended:

In order to increase only minerals and vitamins, without changing the protein and calorie content:

**EZ BALANCE
EQUI-EEZ
EQUI-22**



Recommended:

In order to balance the ration in minerals, vitamins and protein:

EQUILIZER

when the hay contains approximately 12% protein or more;

OPTIMAL

when the hay contains around 12% protein or less, or if you want to increase muscle mass (topline)



Recommended:

In order to increase calories and protein, you can increase the amount of feed served if it is less than the manufacturer's recommendations, or add extra fat and protein:

PUR-ATHLETE



FEED RATE PROTOCOL NOTICE

This feeding protocol described here pertains only to Cargill Limited Horse Feeds. There is not established feeding protocol that all feed companies must follow. Purina provides two feeding rates on their tag a "Minimum" and a "Purina Superior". The "Minimum" meets the levels established by the NRC Nutrient Requirements of Horses (2007), which will prevent all classic nutritional deficiencies. The "Purina Superior" is a greater level of fortification that promotes an optimal level of performance and immunity. By no means does that imply "Minimum" is subpar, and for the non-competitive horse, that stays home year round and has no health issues there is probably no need to exceed this level. However, if you are feeding a true equine athlete, with all the immune stresses associated with that level of competition, then the "Purina Superior" level is paramount to ensure an optimal level of performance and immunity.