

Needs: generalities

Nutritional needs are derived from the energy they expend according to how their organism functions: energy components, proteins, minerals, vitamins and water.

Your horse's diet must, therefore, be carefully considered in order to ensure that its needs are covered by the intake of feed.

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Technical level   



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Types of needs

Maintenance needs

These needs are related to the **body's energy** needs to **keep itself alive**, without any variation in weight and without reproducing. They correspond to vital functions: breathing, blood circulation, spontaneous movement, combating the cold, etc. These needs increase with the weight of the horse.



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There is also a variation between animals according to sex, breed, temperament, individual processing of the ration, climate, general condition, etc. All these aspects must therefore be taken into account when preparing the feed ration.

Example: an adult gelding who is not working only needs to follow a maintenance diet.

Reproductive needs



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These depend on the **nature and intensity of the reproductive process**: muscle work, foetal development, milk production, growth, fattening, etc.

Example: A lactating brood mare has high reproductive needs.

Maintenance and reproduction needs are added together: **Total needs = maintenance needs + reproductive needs**

Types of needs

Energy



Energy is essential for muscular effort

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Energy is your horse's true fuel. It is **essential for the body to function, for muscular work, for the development of tissues** and products such as milk or muscles.

The energy needs of horses are expressed in **HFUs**: Horse Feed Units. This unit corresponds to the net energy value of one gross kilogramme of barley: **1 HFU = 2,250 Kcal.**

These needs are presented in the tables of recommended daily allowances published by INRA, according to the type of horse and its reproductive needs.

- *Example1: A saddle mare with a live weight of 500 kg on a maintenance diet requires 4.1 HFU/day.*

- *Example2: A saddle mare with a live weight of 500 kg and producing an average of 15 kg of milk per day during the first month of lactation has a total daily energy requirement of 8.5 HFU. This is equal to the sum of 4.1 HFU for maintenance + 4.4 HFU for milk production.*

There are other ways of expressing energy needs in horses around the world. For example, the NRC system developed by the National Research Council (NRC) in the United States.

Proteins

Proteins are one of the **main constituents of the body** (muscles, hormones...).

They are brought into the body, via digestion, in the form of amino acids. These are necessary for the functioning of the body and the synthesis of its own proteins. Certain amino acids, known as indispensable or essential, cannot be produced by the horse and must therefore be provided by their diet. For example, lysine, threonine, etc.

Nitrogen needs are expressed in **MADC** (Digestible Nitrogenous Matter in Horses), which is an assessment of the amount of amino acids digested per kg of feed.

These needs are presented in the tables of recommended daily allowances published by INRA according to the type of horse and its reproductive needs.

- *Example1: A saddle mare with a live weight of 500 kg on a maintenance diet requires 296 g MADC/day.*
- *Example2: A saddle mare with a live weight of 500 kg and producing an average of 15 kg of milk per day during the first month of lactation requires 956 g of MADC per day. This is equal to the sum of 296 g MADC for maintenance + 660 g MADC for milk production.*

As with energy, there are other systems for assessing protein needs around the world.

Minerals

There are two types of minerals:

Macro-elements

These make up the tissues and needs are expressed in grams.

- **Calcium** (Ca) and **phosphorus** (P) are particularly important for bone development, milk secretion, muscle contraction, etc. It is necessary to ensure a balance between Ca and P intake to avoid pathologies due to

a lack of or excess of phosphorus in relation to calcium such as osteofibrosis. **The Ca/p ratio is between 1.5 and 1.8.**

- **Sodium** (Na) intake for working horses must be controlled as their needs are 2 to 3 times higher than those of horses on a maintenance diet. The permanent availability of a salt stone (NaCl) enables the horse to cover its needs, as it self-regulates its salt consumption.

Example: A 500 kg saddle horse on a maintenance diet has a daily requirement of 20 g Ca, 14 g P and 10 g Na.

Trace elements

Present in small quantities, they are **essential to the functioning of the body**. These are for example **iron** (Fe), **copper** (Cu), **iodine** (I)... Daily needs are expressed in **milligrams**.

The trace element needs of horses are not well known. They are largely deducted from the accepted standards for other species.

Vitamins

The vitamin needs of the horse and their coverage are not well known. Apart from B vitamins and vitamin D, the horse is unable to synthesise vitamins. These must therefore be provided by the feed in the ration. The INRA tables present the recommended daily intakes.

- **Vitamin A** has multiple physiological actions, some of which are essential for reproductive function and growth. The daily requirement for a 500 kg horse is 25,000 to 50,000 IU (international units).
- **Vitamin D** is involved in bone development and also plays a role in correcting phosphocalcic imbalances. The requirement for a 500 kg horse is 5,000 to 10,000 IU/day.
- **Vitamin E** contributes towards protecting the organism, protects fat reserves from deteriorating and is involved in the energy mechanisms. The daily requirement for a 500 kg horse is 500 to 800 IU.
- **Vitamin K** helps blood clotting. The requirement is 1 mg/day for a 500 kg horse.
- **Vitamins in the B group** each play a specific role: muscle contraction for B1, energy metabolism for B2 and PP, as well as an anti-anaemic action for B12.
- **Vitamin C** is not essential but can be used in sport horses to stimulate muscle metabolism.

Water



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The water needs of the horse are covered by both the drinking water and the water contained in the feed. Water consumption depends on the dry matter content of the ration. It can vary from **20 to 60 l/horse/day**. It increases with physical activity, depending on the physiological state (lactating mare) or the ambient temperature.

Focus on needs in terms of fibre



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Nutritional fibres include all the carbohydrates in plant cell walls, mostly processed by the microbial flora in the large intestine.

The minimum requirement in terms of fibre (pectin, cellulose, lignin...) is estimated to be **between 15 and 18%** of the ration (expressed in raw cellulose).

Fibre is indispensable to the horse because it fulfils several functions:

- **Your horse's well-being:** By increasing the duration of ingestion, fibre contribute towards keeping the horse busy and calm. Under natural conditions, the horse spends 15 to 19 hours a day eating. It is therefore necessary to provide a daily ration of at least 5 kg of dry fodder (or equivalent) for a 500 kg horse. The minimum recommended amount is 1 to 1.5% DM of the horse's live weight.
- **Wear on teeth:** Horses chew forage (hay) more than they chew concentrated feed. In this way, they regulate the length of their teeth, especially premolars and molars.

- **Effect of filling food:** fibres stimulate transit. They are therefore essential for the digestive health of your horse and help to prevent certain digestive disorders (diarrhoea, colic, indigestion, laminitis, etc.)
- **Nutritional value:** hay with a good feed value can thus cover all the needs of a horse/pony with a maintenance diet or undertaking moderate work.

Things to remember



- Correctly estimating your horse's needs is essential to preparing a good diet.
- Beware of overfeeding!
- To cover its needs as precisely as possible, without excess or deficiency, balance your horse's ration.

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