

Feeding behaviour of grazing horses

Understanding the feeding behaviour of grazing horses is important in order to optimise the proportion of grass in the horses' diet. As a staple food for domestic herbivores, grass is the primary nutritional resource available for raising and maintaining horses in temperate zones. Marked by its richness and balance of energy and protein, this forage provides a food supply at lower production costs compared to other foods.

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Technical level   



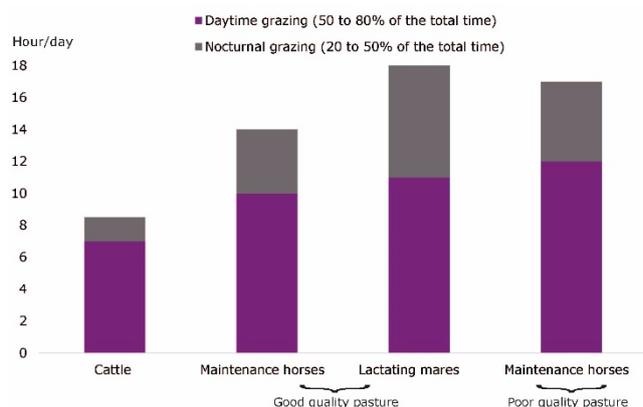
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Feeding: horses' main activity

A real ability to adapt

On average, horses spend 15 hours a day feeding, about twice as long as cattle. This feeding time is possible due the rapid digestive transit as a result of their lack of rumination. It determines how much the animals ingest and depends on their nutritional requirements. When the availability of grass decreases or

when the quality of vegetation is poor, horses can increase their grazing time to up to 19 hours per day to cover their nutritional needs.



Source: based on INRA, 1984

The feeding activity is organised into **3 to 5 meals** per day during which time the whole herd grazes for several hours. The two longest meals are at daybreak and at nightfall.

In contrast to ruminants, horses also graze at night, for 3 to 7 hours. In warm weather, which encourages the presence of biting insects, daytime grazing time is reduced and night-time grazing increases.

GLOSSARY



- DM = Dry Matter ⇒ on average, grass consists of 15% DM LW = Live Weight (weight of the animal)
- MAT = Total Nitrogenous Matter
- NDF = Neutral Detergent Fibre (% cellulose, hemicellulose and lignin in the plant)

Quantities of grass ingested

Ingestion of grazing horses

Little information is available regarding the ingestion of horses on pasture (Table 1)

Table 1: Quantities of dry matter ingested by horses on pasture (according to Edouard et al. 2009 and Collas et al., 2013)

		LW (in kg)	Ingestion (in gDM/kg LW/d)	Pasture	Meadows
Maintenance horses	Draft horses	674	34	Ongoing	Natural humid pasture (Marais Poitevin, France)

		LW (in kg)	Ingestion (in gDM/kg LW/d)	Pasture	Meadows
	Przewalski	279	35	Ongoing	Natural reed pasture (Austria)
Lactating mares	Selle	560	24	Ongoing	Temporary (New Zealand)
	Selle	590	25	Rotating	Fertile permanent pasture (Corrèze, France)
	Camargue	372	38	Ongoing	Natural wetlands (Camargue, France)
Growing foals	Selle (1 year old)	350	20	Rotating	Temporary (New Zealand)
	Selle (1 year old)	266-355	12-16	Ongoing	Natural ± fertilised (Australia)
	Selle (1-2 years old)	340-480	19-23	Rotating	Temporary meadows (Corrèze and Normandy, France)
	Selle (2 years old)	477-514	21-24	Rotating	Temporary meadows (Corrèze, France)
	Draft horses (2-3 years old)	719-742	19-33	Rotating	Natural wetlands (Marais Poitevin, France)
	Draft horses (2-7 years old)	410-850	26-32	Ongoing	Natural wetlands (Marais Poitevin, France)

In animals on a maintenance diet

The values measured in maintenance animals grazing in humid pastures (draft mares) or natural pastures and reed pastures (Przewalski's horses) - on average 34 gDM/kgLW/d - are much higher than those recorded in geldings on a maintenance diet that are trough-fed with green or dry natural grass forage freely available (19 to 23 gDM/kgLW/d).

In lactating mares

The values measured in lactating Camargue mares grazing on natural pastures (on average 38 gDM/kgLW/d) are also higher compared to the results obtained with trough-fed animals (31 to 34 gDM/kgLW/d). While Selle mares at the same stage of lactation either grazing on temporary meadows in New Zealand or on fertile permanent pastures in France only ingested 24-25 gDM/kg LW/d.

In growing horses

In growing foals, daily intake values relative to live weight are systematically higher for draft animals (19 to 33 gDM/kg LW/d) than for saddle horses (12 to 24 gDM/kg LW/d). As shown in trough-fed foals, age-related variations in intake are small when compared to the live weight of the animals.

Need for further studies and research



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These studies on grazing were carried out under a wide variety of conditions: types of animals, types of vegetation cover and using different methodologies. Comparative studies, conducted under controlled conditions, are absolutely necessary to understand the origin of the observed variations in feed intake and to clarify the ability of different types of horses to cover their needs in different grazing situations.

Studies conducted in growing saddle horses have clarified **the impact that the height and quality of the plant cover can have on grazing ingestion**. They showed that the quantities of grass ingested (on average 21 gDM/kgLW/d) and the growth of these animals remained stable when the height of the plant cover (good quality plant cover; MAT=18% DM; NDF=49% DM) decreased from 17cm (200 gDM/m²) to 6cm (71 gDM/m²).

In a comparable situation, cattle are disadvantaged further by the reduction in the height of plant cover due to their inability to graze short plants and to graze for a long period of time. When the authors of this study allowed the highest plant cover to mature (80cm; 830gDM/m²; MAT=7% DM; NDF= 62% DM) and the animals were offered these plant covers at 6, 13 and 80cm high in binary choices, their daily intake also remained constant (24 gDM/kg LW/d).

Due to their digestive physiology, compared to cattle, horses are able to consume larger quantities of forage, especially roughage which is more mature and therefore less rich (in energy and especially protein). Thus, studies on forage at the budding or flowering stage when freely provided in a trough, have shown that the high levels of intake by working mares enabled them to maintain a positive energy balance whatever their physiological stage. Conversely, cows and ewes did not meet their pregnancy and lactation needs with the same forage.

On pasture, draft foals grazing on humid grass also ate one and a half times more than young cattle grazing the same plant cover (29gDM/kgLW/d versus 19gDM/kgLW/d).



Things to remember: grazing horses are highly adaptable in response to variations in accessibility and nutritional value of the grass on offer. They can process roughage as a result of their high intake and are also efficient at eating short plant cover because of their double row of incisors and their ability to graze for a long time.

Food choices

Varietal species

Horses are relatively discerning about grass. Nevertheless, when the availability of grass decreases due to high grazing pressure or in winter, for example in the wild, horses are able to considerably expand their diet.

There has been little in the way of studies into horse's preferences when it comes to plant species. In a study analysing grass preferences, horses consumed more red fescue (*Festuca rubra*) and tall fescue (*Festuca arundinacea*) while common ryegrass (*Lolium perenne*), meadow foxtail (*Alopecurus pratensis*) and meadow fescue (*Phleum pratense*) were less preferred. A preference for hybrid ryegrass (*Lolium italicum* × *Lolium perenne*) was also noted.

Preference for "young" grass

Among domestic herbivores, horses are known to graze areas of short grass within the ground cover and to avoid areas of tall grass where they concentrate their waste. This behaviour has long been justified as a strategy to avoiding the larvae of gastrointestinal parasites present in the vicinity of dung.

More recently, work has shown that horses' selection of high nutrient value grazed areas may be more appropriate as a strategy to maximise digestible protein intake. It has been shown that:

- When faced with a choice between good quality ground cover, growing saddle horses systematically select the tallest plant cover:
- They preferred a good quality short ground cover (MAT=14% DM; NDF=55% DM) to a taller cover that has gone to seed with lower nutrient value (MAT=7% DM; NDF=62% DM). The animals ate the short ground cover for 70% of their daily feeding time.

Physiological status

The modulation of equine feed choices according to the specific characteristics of the animals has received very little attention. However, authors showed that lactating donkeys and Shetland ponies selected areas of short ground cover more than their non-lactating counterparts. This confirmed that the consumption of digestible nitrogen is a major determinant of equines' food choices.

Social influence

The **influence of the social environment of animals** has been more widely studied. Social facilitation accelerates **learning processes** by enabling the development of **preferences and avoidances** more quickly than by trial and error. Adult horses would be capable of such learning, although some studies point to the limits of these abilities.

Influence of the mother

In ruminants, the mother's influence on juvenile food preferences is well established. The only study carried out on horses did not show that the diet of Camargue foals was influenced by that of their mother or peers with whom they grazed.

In herds

Within a herd, agonistic interactions (aggression, negative relationships) between individuals in the same group modify the behaviour and diet of subordinates who no longer have access to certain rare and preferred resources.

Large herds

In the Camargue, mares grazing in large groups showed more agonistic interactions that resulted in more frequent interruptions of their grazing phases than when they were in small groups. During collective displacements, stallions have often been described as pushing mares accompanied by their young to encourage them to change feeding sites

Things to remember



- Horses are relatively discerning when it comes to grass.
- In spite of their ability to eat older grass, horses graze on short grass, i.e. grass in a young vegetative stage which has a higher nutritional value. This behaviour appears to be consistent with a strategy of maximising digestible protein intake.
- The social environment in the herd (aggression, dominance, leadership) seems influence the behaviour and diet of horses, but the results need to be confirmed.

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