



Question raised by requestor

What is the maximum period of time an equine can be kept without access to roughage, in regards to its physiological needs and workload? Is a maximum period of 4 hours scientifically based, as described in the Guides to good animal welfare practice for the keeping, care, training and use of horses, donkeys and donkey hybrids made by the Voluntary initiative group on equines of the EU Platform on Animal Welfare?



Answer

European legislation on equine feeding

The EU Directive 98/58/EC on animals kept for farming purposes (1) states that animals must be fed with a diet appropriate to their age and species, in sufficient quantity to satisfy their nutritional needs and maintain a good health, without causing unnecessary suffering or injury, and that animals must have access to feed at intervals appropriate to their physiological needs.

Equine feeding behaviour

Equines forage for 14–18 hours per day, and more often at dawn and dusk (2,3). In temperate climate zones (i.e. when grass is available the majority of the year), they may graze less in summer and more the night (if temperatures are high during the day) (4). The feeding behaviour of equines is organised in meals, with periods in between meals during which they don't feed (5).

Equines maintain a high level of gut fill by avoiding long intervals between meals. In natural conditions, the median fasting interval is 45 minutes during the cooler weather (between approximately 6 and 13°C (monthly average) (6)), and 90 % of intervals are less than 2 hours, and none are more than 3.5 hours (feral (Camargue) horses in France) (5). During the cooler weather, meals are longer during the day than during the night. As the length of meals tend to decrease during the day in hot weather, the longer fasting interval was observed in June and lasted approximately 4.2 hours. There is a correlation between the length of fasting intervals and the length of meals: long fasting intervals are followed by long meals, probably to reach satiety (5).

External factors such as weather conditions, workload, flies, lactation and social composition of the group can affect the pattern of feeding behaviour. For instance, hot weather conditions (7) or flies (5) can reduce feed intake at pasture during daylight, thus increasing fasting intervals. Regarding workload, the more an equine will have to work, the more energy it requires. Consequently, if a working equine does not have *ad libitum* access to roughage (during a work pause), the number and length of fasting intervals will have an impact on its health and welfare (8).

Good practices regarding feeding intervals

A diet based on roughage is required for a good welfare, whereas diets low in roughage and long fasting intervals (related to the rapid ingestion of concentrates) is associated with health issues such as colic, stomach ulcers, laminitis, and stereotypic behaviours (3,9,10).

When equines do not have access to pasture, hay should be provided *ad libitum*, taking care, however, to provide a balanced diet to prevent health issues. If the hay is provided in several meals, slow-feeders can be used to increase the time spent foraging (11), resulting in shorter fasting intervals between meals. However, horses with access to *ad libitum* hay (either provided loose or in a slow-feeder) spent approximately 12–13 hours feeding per day and displayed less abnormal and agonistic behaviours than horses provided with 6 hay meals of 1 hour per day, even with only 3 hours intervals between meals (12). The use of slow-feeders should not therefore replace a high level of roughage provision. Finally, precautions must be taken with the use of slow-feeders due to the risk of dental injuries.

Short answer to the question raised by requestor

Based on EU legislation stating that feeding intervals must be appropriate to animals needs, on the scientific literature on equines' needs, and on the complexity of factors influencing foraging and feeding behaviour it is not possible to give a precise recommendation regarding the maximum period of time an equine can be kept without access to roughage. As a general recommendation a maximum of 4 hours without roughage during daytime seems appropriate.



References

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