



Environmental enrichment for equines



What is an enrichment?

In natural habitats, animals receive many stimuli that vary in place and time. In such habitats, they can express a wide range of behaviours that define the species' behavioural repertoire. Farming or captive environments are designed to meet biological basic needs (e.g. for rest, feeding), but are far less complex than "natural" habitats. When performed, some behaviours may procure positive emotions (e.g. play in young, control of the environment). In poor environments, animals are not able to express some of the behaviours from their repertoire and lack stimulation. As a consequence, they may be frustrated, lack positive emotions, or experience boredom.

Enriching the environment requires understanding the animals' needs and preferences, which depend on the individual and its different characteristics (e.g. species or breed, experience, developmental stage). As a starting point, a good knowledge of the species, their behaviour and biology, is essential to investigate and potentially implement relevant enrichments.

The concept of environmental enrichment refers to a wide range of modifications to the environment of captive or farmed animals that offer adequate stimulation and facilitate the expression of highly motivated behaviour thus promoting positive emotions and improving the animal's welfare. Environmental enrichments can be classified into five (non-exclusive) categories:

- **Physical enrichments** that include the complexity of the animal's enclosure and the provision of additional elements (e.g. hiding places);
- **Occupational enrichments** that promote physical and/or psychological activities by providing

opportunities to exercise or to engage in cognitive tasks;

- **Sensory enrichments**, designed to stimulate one or several senses of the animal, and include visual, auditory, olfactory, tactile and taste stimulations;
- **Feeding enrichments** that promote foraging and feeding behaviour by providing new or varied foods, or feed delivery methods or tools;
- **Relational enrichments** that embrace social contacts, development of safety feeling, social facilitation or learning in diverse situations, and specific bonds with conspecifics or individuals of other species (including humans).



Legal requirements

The EU legislation to protect farm ruminants and equines does not mention enrichment. Council Directive 98/58/EC for the protection of farmed animals nevertheless mentions ethological (behavioural) needs.

Council Directive 2010/63/EU for the protection of animals used for scientific purposes mentions enrichment, in reference to the expression of behaviour and the reduction of stress.

There is no reference to the provision of specific enrichments for equines.



Additional considerations

Enrichment is only considered to be enriching if it is perceived as such by the animal, i.e. providing opportunities to fulfill behavioural needs and experience positive emotions and good welfare. Housing supplementations (i.e. adding a few elements to suboptimal environments) that decrease poor welfare in the short term but are not sufficient to promote good welfare are thus not considered as enrichments.

Equines and their farming systems

For inspection recommendations, see the **Indicator Factsheet 'Environmental enrichment for ruminants and equines'**

Equines behaviour and sensory abilities

- Equines distinguish some colours (dichromatic vision) and hear sounds from 50 Hz to 33.5 Hz. The Pryer reflex, enables equines to orientate the pinna (ears) towards a sound without moving the head. They have good olfactory abilities allowing them to distinguish complex odours and emotional states of conspecifics, very good taste perception and a developed tactile sense.
- Equines (horses, donkeys and their hybrids) form herds and relationships with their conspecifics. Separation from conspecifics is a source of social stress.
- At pasture and during daylight, equines spend around 70% of their time feeding, 20% resting, 5% walking and 5% involved in other behaviours like social interactions, drinking or self-grooming. Equines permanently housed indoors may experience and perhaps express a frustration linked to the lack of opportunity to forage.
- Equines have a very diversified fiber-based diet and actively choose their food. A lack of food diversity as well as a high amount of concentrate increases the risks of frustration and metabolic disorders.



Richness of equines environment in the main European farming systems

- In the European Union many horses, donkeys and their hybrids are kept by private owners.
- The European equine industry is divided into several sectors differing in animal management and purpose:
 - Sports and race horses i.e. athletes are mostly housed in single boxes or sometimes tied in individual stalls with little or no social contact and spatial resources. In general they are fed two to three meals of high energy concentrate food per day and a limited amount of hay.
 - Leisure equines are often housed individually as above but may sometimes be kept in groups, with or without daily access to paddocks or pastures. They are often fed larger amount of grass and roughage, with occasional provision of concentrate food.
 - Horses used for breeding, work or production are far less numerous. They are mostly kept in relatively stable groups, outdoors with stabling or shelter to protect against adverse weather conditions. They are mainly fed grass or roughage with concentrate supplementation when necessary.
- Donkeys are mostly distributed across leisure, equine-assisted activities (human therapy), working (i.e. traction) and production (e.g. milk) sectors.
- Mules are mostly used for leisure and working.

Examples of enrichments and impacts on welfare

Legend: ↗ = Increased, ↘ = Decreased, ⚠ = Attention point



Physical and occupational enrichment

Enrichments	Positive effects on welfare
Access to pasture	↗ foraging activity, free movement ↘ aggressive behaviours, physical injury, lameness ⚠ inappropriate food provision (surplus or deficiency), insufficient water provision/shelter/surveillance
Access to an exercise area	↗ free walking, relaxed behaviour when stabled ↘ prevalence of stereotypic behaviours back in the stable
Shelters (natural or artificial)	↗ protection against adverse weather and insects ↘ thermal stress ⚠ design of artificial shelter can impede air circulation
Sand/dirt to wallow and roll	↗ self-grooming, thermoregulation, protection against insects
Cognitive challenges (e.g. working for food)	↗ learning opportunities ↘ boredom ⚠ frustration if not adapted (e.g. if the task is too difficult)



Sensory enrichment

Enrichments	Positive effects on welfare
Brushes, trees and human stroking	↗ grooming of body regions that are hard to reach, positive emotions ↘ aggressive and stereotypic behaviours
Friendly human voice	↗ positive emotional state ↘ fear of people
Music or radio broadcast	↗ positive social interactions ↘ stereotypic behaviour, stress-induced vocalisations ⚠ some contradictory results, animals can prefer silence to music

Examples of enrichments and impacts on welfare

Legend: ↗ = Increased, ↘ = Decreased, △ = Attention point



Feeding enrichment

Enrichments	Positive effects on welfare
Feed diversity and variety	↗ ingestion, possibility to select appropriate feed ↘ stress
Increased feed delivery frequency	↗ feeding, access to feed for subordinates individuals
Slow-feeder	↗ feeding time



Relational enrichment

Enrichments	Positive effects on welfare
Group housing with familiar conspecifics for adults and young Young raised with their dam	↗ social affiliative behaviours, social learning, growth, play behaviours ↘ stress and fear △ social space required to support group stability and avoid agonistic behaviour
Companion from another species when individually housed (e.g. with goats)	↗ agitation △ separation anxiety when separated from the stable companion
Companion during isolation (e.g. transport)	↘ stress
Regular, predictable and positive contacts with humans (e.g. talking, feeding, stroking)	↗ positive relationship, approach towards humans ↘ avoidance of humans △ humans should consider individual variability (animal's personality) when establishing the contact

Complexity and agency

Giving access to a variety of enrichments in place and over time (i.e. increasing the complexity of the environment and exposing animals to changing environments) while avoiding overstimulation, and allowing animals to behave as an active agent in their environment (i.e. allowing choice between items used for enrichment and control over situations) is generally highly valued by animals.

Legal requirements

Requirements listed are extracted from EU legislation at the date of publication of the present document. National legislation can be more stringent.

Council directive 98/58/EC of 20 July 1998 concerning the protection of animals kept for farming purposes

`(...)
[The principles of the Directive] include the provision of housing, food, water and care appropriate to the physiological and ethological needs of the animals, in accordance with established experience and scientific knowledge; (...)'
(Recital)

`(...)
Where an animal is continuously or regularly tethered or confined, it must be given the space appropriate to its physiological and ethological needs in accordance with established experience and scientific knowledge.'
(Annex, Paragraph 7.)

'Animals kept in buildings must not be kept either in permanent darkness or without an appropriate period of rest from artificial lighting. Where the natural light available is insufficient to meet the physiological and ethological needs of the animals, appropriate artificial lighting must be provided.'
(Annex, Paragraph 11.)

Directive 2010/63/EU of the European Parliament and of the Council of 22 September 2010 on the protection of animals used for scientific purposes

`(...)
(b) Enrichment
All animals shall be provided with space of sufficient complexity to allow expression of a wide range of normal behaviour. They shall be given a degree of control and choice over their environment to reduce stress-induced behaviour. Establishments shall have appropriate enrichment techniques in place, to extend the range of activities available to the animals and increase their coping activities including physical exercise, foraging, manipulative and cognitive activities, as appropriate to the species. Environmental enrichment in animal enclosures shall be adapted to the species and individual needs of the animals concerned. The enrichment strategies in establishments shall be regularly reviewed and updated. (...)'
(Annex III, Section A, Paragraph 3.3)



References

- Botreau, R., Lesimple, C., Brunet, V., & Veissier, I. (2023). Review – Environmental enrichment in ruminants and equines: Introduction. EURCAW Ruminants & Equines. <https://doi.org/10.5281/zenodo.7685132>
- Botreau, R., Brunet, V., & Lesimple, C. (2023). Review – Physical and occupational enrichment in ruminants and equines. EURCAW Ruminants & Equines. <https://doi.org/10.5281/zenodo.7687759>
- Brunet, V., Botreau, R., Veissier, I. (2023). Thematic factsheet – Environmental enrichment for ruminants and equines: the basics. EURCAW Ruminants & Equines. <https://doi.org/10.5281/zenodo.7760722>
- Ginane, C., & Rørvang, M.V. (2023). Review – Sensory and feeding enrichment in ruminants and equines. EURCAW Ruminants & Equines. <https://doi.org/10.5281/zenodo.7687769>
- de Oliveira, D., & Boivin, X. (2023). Review – Relational enrichment in ruminants and equines. EURCAW Ruminants & Equines. Manuscript in preparation.