

Environmental enrichment for ruminants and equines: the basics



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 2008/119/EC specifies that calves must have visual and tactile contacts and must be kept in group from the age of 8 weeks.

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



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.



Examples of enrichments and expected impacts

See species-specific factsheets on cattle, sheep, goats and equines for further details

Physical enrichment

- **Access to an exercise area:** increases locomotion and exploration; decreases body and joint lesions
- **Access to pasture:** increases time spent walking, foraging and feeding; decreases agonistic behaviour, lameness, and skin lesions
- **Visual barriers or platforms:** allows isolation, hiding and escaping, especially in case of threat or conflict

Occupational enrichment

- **Objects to suckle and play:** promotes positive emotions, especially in newborns; reduces boredom
- **Substrate to roll-in:** promotes grooming; helps thermoregulation and protects against parasites
- **Work to access resources:** promotes psychological wellness

Sensory enrichment

- **Tactile stimulations:** (brushes, trees): promotes grooming; decreases aggressive and stereotypic behaviour
- **Taste stimulations:** increases consumption in case of attractive flavours; decreases stress
- **Acoustic stimulations:** (context-dependent) promotes positive emotions; decreases aggressive and stereotypic behaviour

Feeding enrichment

- **Feed diversity (at the same time) and variety (in time):** stimulates feeding; offers freedom to choose and pleasure
- **Changing the location of feeding points or spacing them out:** increases time spent foraging; decreases aggression, abnormal and stereotypic behaviour as well as health disorders
- **Slow-feeders:** increases time spent feeding
- **Edible litters:** stimulates foraging; reduces stereotypic behaviour



Relational enrichment

- **Contacts between dam and offspring:** allows dam-offspring interactions; increases play; improves social skills; reduces stress
- **Group housing:** offers possibility for interactions and bonding; improves social skills
- **Tactile and visual contacts in animals housed individually:** makes animals calmer
- **Positive contacts from handlers:** creates a positive relationship; reduces stress during handling

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.)

Council directive 2008/119/EC of 18 December 2008 laying down minimum standards for the protection of calves

`(...)
(a) no calf shall be confined in an individual pen after the age of eight weeks, unless a veterinarian certifies that its health or behaviour requires it to be isolated in order to receive treatment. (...)
Individual pens for calves (except those for isolating sick animals) must not have solid walls, but perforated walls which allow the calves to have direct visual and tactile contact; (...)'
(Article 3, Paragraph 1.)

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>

