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Original Article



Effect of Environmental Enrichment on Behaviour and Welfare of Farm Animals

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ABSTRACT

Environmental enrichment, which is a process of increasing the behavioural diversity of farm animals, is regarded as a successful strategy compatible with the intensive production of animals. Intensive animal husbandry has negative effects on the ethology of animals that lead to frustration, animal welfare issues, fear, stress, boredom, and abnormal behaviours. Environmental enrichment offers a possibility for animals to express their species-specific behaviours that are by some means prevented in the intensive system of farming. Studies have shown that the application of environmental enrichment has positive effects on the behaviour, physiology, affective processes and welfare of farmed animals. The effectiveness of the implementation depends on the type of enrichment, its arrangement, duration and frequency and specific specie's needs. Environmental enrichment promotes exploratory, social, alimentary and locomotor activities and the overall level of animal welfare. Particular attention is paid to reviewing the general behavioural, physiological and welfare-related findings about the use of environmental enrichment for animals in farm settings. The discussion emphasizes the role of providing species-specific environments through the use of environmental enrichment to improve animal welfare.

Keywords: *Animal welfare, Behaviour, Environmental enrichment, Livestock, Stress*

INTRODUCTION

Under natural conditions, animals have a wide range of opportunities in expressing their species-specific behaviours. This freedom is restricted in intensive farming systems exposing animals to various welfare concerns, including frustration, loss of natural behavioural patterns, and abnormal repetitive stereotyped activity (Botreau *et al.*, 2023). Environmental enrichment involves provision of additional resources to the animals by purposeful changes in their environment to promote the species-specific display of their natural behavioural patterns and improve their welfare status (Madhavatar *et al.*, 2024). The concept of environmental enrichment is closely connected to the fulfilment of the five welfare domains, specifically the animals' freedom to exhibit normal behaviour and absence of fear and distress (Madhavatar *et al.*, 2024).

Types of Environmental Enrichment

Generally, there are five broad categories of environmental enrichment, namely physical, social, sensory, occupational and nutritional enrichment (Botreau *et al.*, 2023; Madhavatar *et al.*, 2024).

- **Physical enrichment** provides an opportunity to increase the space or offer supplementary perches and materials.
- **Social enrichment** offers opportunities for social interactions with other members of the species or humans.
- **Sensory enrichment** focuses on providing sensory experiences such as sounds, smells and visual stimuli.
- **Occupational enrichment** aims at encouraging the animals to perform species-specific activities and games.
- **Nutritional enrichment** focuses on providing alternative feeding methods.

Effects on Behaviour

Less abnormal behaviour

Animals managed in infertile environments usually display abnormal repetitive behaviours. Abnormal repeated behaviours decrease when animals are given appropriate environmental enrichment. Provision of manipulable materials to pigs, for example, reduces tail biting and aggressive behaviour (Godyń *et al.*, 2019).

Enhanced species-specific behaviours

Environmental enrichment promotes species-specific behaviours such as investigative activity in animals such as cattle, pigs and poultry (Botreau *et al.*, 2023). Provision of grooming objects to cows, for instance, promotes self-grooming and alleviates discomfort (Chen and Ogura, 2017). In addition, enrichment encourages normal play and investigative behaviours in young animals (Botreau *et al.*, 2023).

Improved physical activity

Provision of perches, objects for pecking and manipulation, and other structures improves locomotor activity and reduces sitting time for animals. For example, broiler chickens exposed to various forms

of environmental enrichment reported increased levels of activity and decreased sitting time (Yenilmez *et al.*, 2025).

Effects on Stress and Fear

Improved physiological function

Environmental enrichment can reduce stress markers such as decreased levels of corticosterone and heart rate in chickens (Yildirim and Taskin, 2017).

Improved fearlessness

Animals exposed to environmental enrichment report improved ability to cope with new environments, reduced fearful responses, enhanced ability to handle stress and improved social interactions. This is particularly important in poultry farming, where reduced fearfulness by the birds is associated with easier handling and improved welfare (Yildirim and Taskin, 2017).

Effects on Health and Physical Status of Animals

Improved bone structure and integrity

The provision of perches and encouraging physical activity to broiler chickens, for instance, improves bone growth preventing leg deformities (Yenilmez *et al.*, 2025).

Improved litter and housing

Environmental enrichment can improve the quality of litter, especially through encouraging physical activity thus minimising wet litter and disease transmission (Yenilmez *et al.*, 2025).

Improved immune function and production

Reduced physiological stress and improved welfare status generally contribute to the enhancement of the immune function and by extension, improved production. In addition to the physiological benefits discussed above, environmental enrichment has a positive effect on reproductive performance and general health. For example, enriched pigs report less lameness and better body weight at first mating (Madhavatar *et al.*, 2024).

Environmental Enrichment in Different Farm Animals

- **Poultry:** Broiler chickens' benefit from the provision of perches, manipulable materials, and increased levels of exploratory activity promoting welfare and reducing stress (Yenilmez *et al.*, 2025; Yildirim and Taskin, 2017).
- **Cattle:** Environmental enrichment in cattle involves provision of objects for tactile investigation, social housing and improved animal-friendly husbandry practices promoting comfort and reducing stress (Chen and Ogura, 2017).
- **Pigs:** Pigs require manipulable materials to promote investigational activity and prevent boredom and associated detrimental effects such as aggressive behaviour (Godyń *et al.*, 2019).

Challenges of Environmental Enrichment

Although beneficial, provision of environmental enrichment requires careful consideration as inappropriate interventions can cause more harm to the animals than good (Botreau *et al.*, 2023).

Moreover, the cost-benefit analysis of different enrichment interventions as well as the level of knowledge among farmers may constrain the widespread adoption of the interventions (Botreau *et al.*, 2023).

CONCLUSION

Environmental enrichment is generally beneficial to most farm animals by promoting species-specific behaviours improving welfare and reducing stress, including abnormal behaviours. The beneficial effects of environmental enrichment have been demonstrated across animal species including poultry, pigs, cattle and others. Therefore, livestock farmers should consider adopting appropriate environmentally enriching interventions to promote animal welfare while benefiting from the associated production advantages.

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