

Evaluation of agroforestry as a sustainable, and welfare friendly, free-range egg production system

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The focus of modern farming is changing with a stronger emphasis on biological sustainability, efficient use of natural resources and minimising the release of pollutants into the environment. One avenue for sustainable intensification of agriculture is the integration of livestock and crop operations into complete production systems. This review evaluated the current scientific knowledge on the integration of free-range egg production and agro-forestry, including studies on the suitability of habitat (for expression of natural behaviour); of (range) feed sources, environmental aspects and health and welfare problems. Agro-forestry offers a suitable habitat for chickens as it resembles their natural environment. The introduction of agro-forestry systems can lead to an increase in the biodiversity of invertebrates and arthropods, providing additional feed sources. Tree cover can stimulate ranging behaviour as trees offer protection from wind and sun. The range offers opportunities for the expression of species-specific behaviours such as roosting and dust-bathing. The management of agro-forestry may require the use of biocides (for weed control), but hens may be used to control herbage below trees in the early stages of growth rather than using herbicides. Hens may eat new buds on growing trees. The risk of range pollution is low because the majority of the manure will be deposited in the poultry houses. Manure inputs on the range may even be beneficial for the trees. Mechanical damage to trees can occur when using machinery for management (e.g. daily egg collection). Health and welfare risks will be similar to those in other outdoor systems (e.g. feather pecking, parasite burden). There may be an increased risk of predation as forests can provide a habitat for predators. A greater number of wild birds have been observed in agro-forestry. Hens may be able to cope better with predation risks as they can take shelter in or under trees and shrubs. Information on different types of agro-forestry systems will be presented (fruit orchards, short rotation coppice plantations). Integrated agro-forestry systems offer a suitable habitat for laying hens by providing tree cover, additional feedstuffs from the range and the opportunity to express species-specific behaviour. Knowledge on environmental aspects and potential health and welfare problems for poultry is still limited.

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