

# **Welfare of Layer Hens: Recent Developments and Implications for Free-range Production**

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## **Introduction**

The welfare of layer hens is a highly publicised issue and consumers are pressing for improvements in housing standards and removal of intensive cage systems. The Australian egg production industry is responding and in 2008 the standards set by the Model Code of Practice for the Welfare of Animals became enforceable by law, including that a minimum 550cm<sup>2</sup>/hen be provided (Department of Primary Industries, 2011). The European Union (EU) is further ahead in that a complete ban of battery cages will come into effect by 2012 (Fossum *et al.*, 2009; Petek & McKinstry, 2010). Consumer preference for free-roaming systems has its drawbacks, since with freedom of movement and ability to express natural behaviours comes greater chance of injury due to complexity of housing, disease, nutritional deficiencies, piling and feather pecking (Lay *et al.*, 2010). This paper will review research into recent findings related to the issue of feather pecking and improving psychological wellbeing within layer flocks.

## **Discussion**

Current global trends toward free-roaming housing systems have highlighted the need for better knowledge about hen behaviour, as the removal of cages may increase the problem of feather pecking and cannibalistic behaviour in flocks. The transfer from battery cages to litter-based systems in Sweden in 2001-2004 saw increased risks of cannibalistic behaviour in laying hens in the new systems (Fossum *et al.*, 2009). Beak trimming is banned in several EU countries and is currently being phased out elsewhere. Since this is a control measure for injurious pecking it is important to understand why feather pecking occurs and investigate alternative prevention options (Petek & McKinstry, 2010).

A study by Lambton *et al.* (2010) aimed to identify important contributing risk factors to the development of gentle and severe feather pecking in free-range systems. A total of 119 flocks were observed from 62 farms, with the majority free-range and organic systems. Flocks were visited at 20-30 and 35-40 weeks old to observe behaviour, plumage condition and farm management. Gentle feather pecking (GFP) occurred more often in beak-trimmed birds, in housing with no perches and at higher stocking densities, while it decreased with increased flock ranging. More importantly, severe feather pecking (SFP) occurred more in flocks that had not been beak trimmed, had exhibited feather pecking when transferred, and when feed was in pelleted form and was spread on the floor.

To improve welfare, management strategies should be implemented to reduce feather pecking. Lower stocking densities would increase flock range of movement, and perches would provide escape routes. Providing foraging motivation would direct attention to foraging rather than feather pecking, and feather-pecking histories could be documented to pre-empt any SFP outbreaks. A limitation to this research was that observations only started at the beginning of lay. Including rearing methods and pre-laying behavioural observations could help provide greater insight into feather-pecking motivations.

While feather pecking can be attributed to environmental conditions, it has also been connected to certain psychological characteristics such as fearfulness in chicks (Rodenburg *et al.*, 2004). This has important implications in rearing, as certain stimuli may increase fearfulness traits in chicks. Edwards *et al.* (2010) investigated the effects of human handling on physiological stress and behaviour of laying hens, to determine the effects of additional contact (AC) or minimal contact (MC) during rearing, handling quality in adulthood and the handling proximity in adulthood. A total of 288 birds were sampled and divided into 2 groups, AC and MC. Responses to positive and negative handling and handling proximity (as near, middle and far) were measured. Responses involved avoidance movements and stress responses measured through

corticosterone concentrations. Less avoidance was recorded in AC birds than MC birds during the approaching-human test, while greatest avoidance behaviours were observed in the far handling-proximity group. Corticosterone concentrations were found to be lower in positively treated hens compared to negatively treated hens following contact with humans.

The most significant determinants for reducing avoidance of humans in birds were additional human contact in rearing and close proximity in handling as an adult. The lower stress hormone response in positively handled hens demonstrated the importance of quality handling and how it can reduce fear responses. Farmers could implement additional positive handling routines into management procedures to improve flock welfare. To extend these findings to free-ranging systems, the method would need to include a free-roaming sample group, as this study included only caged hens' fear responses.

Productivity and welfare can both be affected by stress in the flock and the focus of Ghareeb's (2010) research was to determine if males had a positive effect on reducing flock fearfulness. Ghareeb used tonic immobility, or "death feigning" as it is known, and social reinstatement as measures of fearfulness among the sample groups. Two lines of laying hens were used with birds divided into an all-female group of 50 hens for each line and a mixed group of 50 females and 5 males for each line. Hens of both lines from the mixed-sex group showed shorter time spent in tonic immobility compared to those in the all-female group. Social reinstatement measurements also showed hens from the mixed group were less fearful of exploring an unfamiliar runway and quicker to reunite with a familiar hen at the end of the runway. These results demonstrate reduced fearfulness when flocks include males. Integration of males into flocks by farmers could improve welfare, as sociality would improve and stress would be reduced.

## Conclusion

The results of these studies show that the major welfare issue of feather pecking can be influenced by multiple factors relating to housing and management (Lambton *et al.*, 2010). Flock fearfulness and stress can be reduced through increased positive human interactions (Edwards *et al.*, 2010) and strategic use of males within the laying flock (Ghareeb, 2010). To improve layer hen welfare, further research is required to apply management strategies on a large scale to test the effectiveness of their use for commercial poultry farms.

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