Can Changes in Housing Conditions Reduce the Incidence of Feather-pecking in Laying Hens?

By Monika Ling

Word count: 979

Introduction

Feather pecking (FP) in laying hens involves pecking at or plucking the feathers of conspecifics. The behaviour is a major welfare issue since it can lead to injury, feather damage, denuded skin areas, and cannibalism (Jones *et al.*, 2004). Current research has focused on identifying the motivation of hens to perform FP, in order to determine whether certain housing conditions increase the likelihood that hens will perform the behaviour (Dixon *et al.*, 2008; Shimmura *et al.*, 2008a). It is hoped that identifying factors that predispose hens to FP can lead to appropriate improvements in housing conditions, thereby reducing the incidence of the behaviour and improving hen welfare.

Discussion

Feather pecking is an abnormal activity thought to stem from the inability of hens to express normal foraging behaviour when housed in commercial cages (Jones *et al.*, 2004). Dixon *et al.* (2008) aimed to study the motivation behind FP by comparing the morphology and motor patterns of different types of pecks. The authors videoed the behaviour of 60 caged chickens and categorised pecks as either dustbathing, foraging, object pecking, feeding, or FP. Pecks were classified according to duration of head fixation, duration from fixation to contact, and duration of the whole peck. A comparison of the morphology between different pecking types revealed that feather pecks closely resemble foraging pecks in relation to duration of the whole peck and time of contact with the stimuli, but significantly differed from all other pecking types. The close morphological resemblance of FP and foraging in each hen in the study suggests that the two behaviours derive from the same underlying motivation. The authors thus proposed that FP is a form of redirected behaviour that is performed when hens are unable to satisfy their motivation to forage (Dixon *et al.*, 2008). From a welfare perspective, this would imply that the incidence of FP could be reduced if hens were housed in an environment that allows full expression of natural behaviour; for example, by providing hay, silage and plant material to encourage fulfilment of their motivation to forage.

Shimmura *et al.* (2008a) confirmed the hypothesis that environmental enrichment reduces the incidence of FP. They aimed to evaluate the effects of outdoor pasture on pecking patterns, by comparing functional behaviour of 144 hens kept in single-tiered aviaries and free-range systems. Environmental enrichment was incorporated in the free-range systems through provision of an outdoor area containing plant forage and clover. Different pecks were classified in each system using a combination of quantified measurements of position in the cage, head position, and contact with other birds. The incidence of FP was significantly lower in flocks kept in free-range systems with forage than in the aviaries, confirming the hypothesis that hens kept in cages and aviaries compensate for a lack of foraging opportunities by performing FP (Shimmura *et al.*, 2008a). This implies that the behaviour could be reduced by housing poultry in free-range conditions with an outdoor area, thereby improving hen welfare. Van Krimpen *et al.* (2008) also suggest that providing low-energy coarsely ground polysaccharides in the diet may reduce the incidence of FP. They hypothesise that hens have a reduced motivation to FP when provided with opportunities to spend time feeding and foraging.

Group size is said to be an additional factor influencing the incidence of FP (El-Lethey *et al.*, 2000). Shimmura *et al.* (2008b) tested this theory by comparing the beak-related behaviours of hens in different housing systems. In the study, 284 hens were separated into six different environments: small and large conventional cages, small and large furnished cages, single-tiered aviaries, and free-range runs. Visual scans recorded the behaviour and type of beak use of birds in each housing system, twice daily over 40 weeks. It was found that the

frequency of beak use was the same in each type of housing system, but FP occurred significantly more frequently in pens containing larger numbers of hens compared with cages housing smaller numbers. This might be due to lower levels of aggression when there are fewer hens per group, and further research is needed to understand the reasons behind the relationship between lower flock numbers and reduced levels of FP. Nonetheless, results of this study alone suggest that the risk of FP in poultry can be lessened by reducing the number of hens per enclosure (Shimmura *et al.*, 2008b).

The tendency to feather peck is also thought to be influenced by space allowance and stocking density in poultry housing (Jones *et al.*, 2004). Sarica *et al.* (2008) investigated the effects of different stocking densities on plumage condition, mortality and feather loss in hens kept in battery cages. Pullets (n=300) were separated into cages with densities of 2000, 1000, 667 and 500cm^2 per hen, and plumage scores were graded over 35 weeks according to feather loss caused by FP. Results showed that FP and pecking-related mortalities occurred significantly more frequently in cages with high stocking density and reduced space allowance. The highest degrees of plumage damage from FP and the highest pecking-related mortalities were recorded in the cages allowing 667 and 500cm^2 per hen, whereas there were no instances of mortality and lower levels of plumage damage in hens housed in 2000 and 1000cm^2 cages (Sarica *et al.*, 2008). From a welfare perspective this suggests that laying hens should be provided with more floor space and housed in lower stocking densities to reduce the incidence of FP. Further research is needed to precisely determine the optimal space allowance per hen.

Conclusion

Current research suggests that FP in laying hens can be reduced through changes in housing conditions, notably by providing forage in a free-range system, reducing hen numbers per housing group, and increasing space allowance per hen. These changes improve the welfare of laying hens by providing them with opportunities to perform natural behaviours and maximise levels of health and survivability by reducing the likelihood of FP.

References

Dixon, L., Duncan, I., Mason, G. (2008) What's in a peck? Using fixed action pattern morphology to identify the motivational basis of abnormal feather-pecking behaviour. *Animal Behaviour* 76, 1035-1042.

El-Lethey, H., Aerni, V., Jungi, T., Wechsler, B. (2000) Stress and feather pecking in laying hens in relation to housing conditions. *British Poultry Science* 41, 22-28.

Jones, R., Blokhuis, H., de Jong, I., Keeling, L., McAdie, T., Preisinger, R. (2004) Feather pecking in poultry: the application of science in a search for practical solutions. *Animal Welfare* 13, 215-219.

Sarica, M., Boga, S., Yamak, U. (2008) The effects of space allowance on egg yield, egg quality and plumage condition of laying hens in battery cages. *Czech Journal of Animal Science* 53:8, 346-353.

Shimmura, T., Suzuki, T., Hirahara, S., Eguchi, Y., Uetake, K., Tanaka, T. (2008(a)) Pecking behaviour of laying hens in single-tiered aviaries with and without outdoor area. *British Poultry Science* 49:4, 396-401.

Shimmura, T., Suzuki, T., Azuma, T., Hirahara, S., Eguchi, Y., Uetake, K., Tanaka, T. 2008(b)) Form but not frequency of beak use by hens is changed by housing system. *Applied Animal Behaviour Science* 115, 44-54.

Van Krimpen, M., Kwakkel, R., Van der Peet-Schwering, C., Hartog, L., Verstegen, M. (2008) Low dietary energy concentration, high nonstarch polysaccharide concentration, and coarse particle sizes of nonstarch polysaccharides affect the behaviour of feather-pecking-prone laying hens. *Poultry Science* 87:3, 485-496.