

Welfare Issues in Free-range Laying Systems

Explores the risk factors associated with feather-pecking in free-range systems and strategies to reduce its prevalence.

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Introduction

Injurious pecking in laying flocks is the major welfare concern of the egg industry (Lambton *et al.*, 2015). This includes severe feather-pecking (SFP), vent pecking (VP) and cannibalism. SFP reduces a bird's feather coverage, removing her insulation and leading to an increase in feed intake to maintain body temperature (Blokhuis *et al.*, 2007). SFP is painful for the victim (Lambton *et al.*, 2015) and, in severe cases such as cannibalism, can lead to death. Multiple factors in the rearing and laying periods predispose free-range laying hens to these behaviours. An understanding of these will assist in developing specific management strategies that reduce this behaviour and improve hen welfare. Current research focuses on providing enrichment to alleviate feather-pecking, as it is thought to be a re-directed foraging behaviour (Daigle *et al.*, 2014).

Discussion

Management during the rearing period has an impact on the prevalence of feather-pecking during laying. De Haas *et al.* (2014) studied 35 flocks of laying hens from rearing to 40 weeks of age. The flocks were reared on commercial farms using both aviary and floor systems. These styles of housing utilised different amounts and types of litter substrate, depending on the rearing farmer's preference. Rearing factors contributed to 34.3% of feather-pecking development later in life. One of the main factors contributing was availability of litter, a form of enrichment. Chicks housed with litter limitation for the first four weeks of life had higher incidences of SFP at five weeks of age, which were associated with high levels of SFP during the laying period. This strong correlation shows that management needs to be appropriate during early life to reduce incidences of SFP and improve hen welfare.

Lambton *et al.* (2015) investigated the risk factors for VP, SFP and cannibalism in a variety of commercial free-range and organic farms. Farmers reported incidences of cannibalism and VP, in conjunction with behavioural assessments made by the researchers, at 25 and 40 weeks of age for each flock. From this, a number of risk factors related to housing were associated with forms of injurious pecking. Perches more than 50cm high were consistently associated with the observation of VP within a flock. Previously, the opposite had been found in relation to both VP (Bilčík & Keeling, 2000) and SFP (Lambton *et al.*, 2010), suggesting that high perches discouraged these behaviours. But perch arrangement was also found to be a factor, with many farms placing perching chickens at head height of other birds. This arrangement stimulates the birds to peck at cloacal regions (Bilčík & Keeling, 2000). De Haas *et al.* (2014) found that the style of shed was another important factor in the development of feather-pecking. Birds in level systems sustained more feather damage than those in aviary systems. In contrast, multi-level aviary housing provides the hens with more routes of escape from aggressive conspecifics (De Haas *et al.*, 2014).

Lambton *et al.* (2015) also found that age was a significant factor in feather-pecking. Cannibalism had its highest prevalence just after the commencement of lay, suggesting that the physical demands of beginning to lay increases the risk of cannibalistic pecking. VP was also higher at this time. Small hens are predisposed to showing cloacal mucosa during laying, increasing their risk of being pecked by conspecifics. The prevalence of cannibalism and VP increases when SFP is present in a flock. To reduce the occurrence of these destructive behaviours sheds need to be set up appropriately, minimising risk factors for SFP, to improve hen welfare.

Contrary to De Haas *et al.* (2014), Hartcher *et al.* (2015) did not see any reduction in feather-pecking when enrichment, in the form of deep litter, scattered oats and pecking strings, was provided. In this study, enrichment was provided from 12 days of age. Differentiated litter depth and whole oat provisions were ceased from 15 and 20 weeks of age, respectively. De Haas *et al.*, (2014) showed the importance of the first 4 weeks of life on the development of feather-pecking. Hartcher's late onset of enrichment may have missed part of the critical development period, increasing birds' propensity to feather-peck. The removal of enrichment from 15-20 weeks correlated with the beginning of the laying period. Lambton *et al.*, (2015) described this as a period of high demand for the birds, resulting in a lowered threshold for feather-pecking

to begin. This study might have achieved more constructive results for hen welfare if it had incorporated these established risk factors.

Enrichment has long been used to entertain zoo animals whose environments don't allow them to fulfil their natural drives (Shepherdson *et al.*, 1998). This same principle could be used in the housing of agricultural animals to provide a biologically appropriate living space that could improve the welfare of its inhabitants by reducing aggression among conspecifics. With an understanding of the risk factors, strategies can be implemented to reduce them and provide hens with more suitable living quarters. Daigle *et al.*, (2014), provided groups of hens with different sources of enrichment. Bales of hay weighing 5kg (hay) provided reward for their pecking efforts, while plastic boxes, of similar dimension to the bales, containing loose hay (box) resulted in no reward. There was also a control group with no enrichment. Bird behaviour in the pen was observed via ceiling-mounted video cameras and the number of pecks directed at either conspecifics or enrichment was recorded. The amount of SFPs towards conspecifics in the "hay" pens was lower than the amount recorded in control pens. The "hay" hens also directed more pecks towards their enrichment than conspecifics. The viability of this enrichment needs to be investigated further to prove its usefulness in free-range systems.

Conclusion

Enrichment provided throughout the rearing and laying periods may be an alternative means of mitigating SFP in free-range systems (De Haas *et al.*, 2014; Daigle *et al.*, 2015). With the main preventative treatment, beak trimming, facing a ban in the UK from 2016 (Lambton *et al.*, 2015), effective management strategies must be identified and implemented to improve laying-hen welfare.

References

- Bilčík, B., Keeling, L.J., 2000 Relationship between feather pecking and ground pecking in laying hens and the effect of group size. *Applied Animal Behaviour Science*, 68, 55-66.
- Blokhuis, H.J., van Niekerki, T., Bessei, W., Elson, A., Guemene, D., Kjaer, J.B., Levrino, G.A.M., Nicol, C.J., Tauson, R., Weeks, C.A., van de Weerd, H. 2007 The LayWel project: welfare implications of changes in production systems for laying hens. *World's Poultry Science*, 63, 101-114.
- Daigle, C.L., Rodenburg, T.B., Bolhuis, J.E., Swanson, J.C., Siegford, J.M. 2014 Use of dynamic and rewarding environmental enrichment to alleviate feather pecking in non-cage laying hens. *Applied Animal Behaviour Science*, 161, 75-85.
- De Haas, E.N., Bolhuis, J.E., de Jong, I.C., Kemp, B., Janczack, A.M., Rodenburg, T.B. 2014 Predicting feather damage in laying hens during the laying period. Is it in the past or is it in the present? *Applied Animal Behaviour Science*, 160, 75-85.
- Hartcher, K.M., Tran, M.K.T.N., Wilkinson, S.J., Hemsworth, P.H., Thomson, P.C., Cronnin, G.M. 2015 Plumage damage in free-range laying hens: behavioural characteristics in the rearing period and the effects on environmental enrichment and beak-trimming. *Applied Animal Behaviour Science*, 164, 64-72.
- Lambton, S.L., Knowles, T.G., Yorke, C., Nicol, C.J. 2010 The risk factors affecting the development of gentle and severe feather pecking in loose housed laying hens. *Applied Animal Behaviour Science*, 123, 32-42.
- Lambton, S.L., Knowles, T.G., Yorke, C., Nicol, C.J. 2015 The risk factors affecting the development of vent pecking and cannibalism in free-range and organic laying hens. *Animal Welfare*, 24, 101-111.
- Shepherdson, D.J., Mellen, J.D., Hutchins, M. 1998 Second nature: environmental enrichment for captive animals. *Smithsonian Institution Press*, Washington, D.C., USA.