

# Feather pecking in laying hens

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## Introduction

Feather pecking in laying hens, ranging from gentle nibbling to vigorous pulling and removal of feathers, remains a serious problem in the egg industry (Savory, 1995). It causes reduced welfare of the birds and increased economical losses due to increased mortality, reduced egg production, and increased food consumption because of defeathering (Kuo et al., 1991; Lee & Craig, 1991). Several factors involved in the development of this behaviour have been documented in previous studies. The causes include high light intensity, poor ventilation, high stocking density, large group size, and stress (El-lethey et al., 2000); while genetic variation in the behaviour also exists (Kjaer et al., 2001). In recently published articles, it has been claimed that early substrate exposure, social transmission, and dietary protein sources are additional factors influencing the behaviour of feather pecking. Therefore this paper summarises the aims, methods, results, limitations, and animal welfare implications of these studies.

## Discussion

McAdie and Keeling (2002) investigated whether feather pecking is transmitted from an experimental strain of high feather peckers (HFP) to an experimental strain of low feather peckers (LFP) when housed together. Four hundred and twenty chicks were housed in either cages or pens in one of three treatment groups: all HFPs, all LFPs, and a mixed group of half HFPs and half LFPs. Behavioural observations and feather plumage scoring were made at different age intervals, during the rearing and laying phases. There was a higher frequency of feather pecking and a lower plumage condition score in cages than in pens. Furthermore, in cages during the laying period, birds of the LFP strain gave significantly more gentle feather pecks when housed with birds of the HFP strain, and birds of the HFP strain gave significantly fewer gentle feather pecks when housed with birds of the LFP strain. However, this effect was not apparent for any birds in the pens. Therefore, there is some social transmission of gentle feather pecking behaviour in cages, but not in pens, possibly through stimulus enhancement or imitation. This suggests that type of housing may have a greater effect on the incidence of feather pecking than social transmission alone, as mechanisms required for the spread of feather pecking, such as attention to the behaviour of other birds, may be reduced in such an environment where more alternative behaviours are available. Moreover, the presence of feather peckers may have caused an additional stress over and above the stress of living in the cage environment, and so cause other non-feather peckers to develop the feather pecking behaviour. Although gentle feather pecking does not lead to plumage damage, this transmission of behaviour means that social influences are pivotal considerations in the study of feather pecking.

Nicol et al. (2001) examined whether early substrate exposure has durable effects on the subsequent behaviour of adult hens. From days one to 210, 144 laying strain birds were housed in pairs in pens with wire floors. The floors were replaced with solid floors covered in wood shavings at different ages and for different durations by allocation to one of 12 treatments. Further, from day 221, all hens were given shavings or straw, presented alternately for five 24 h sessions over ten consecutive days. Adult birds that had never experienced shavings performed significantly more feather pecking than birds in any other treatment, while birds with minimum exposure to shavings of ten days showed significantly less feather pecking behaviour. However, current substrate was of such importance that adult birds housed on shavings performed significantly less feather pecking than birds on wire, regardless of previous experience. This suggested that birds are highly adaptable and are able to accept and use substrates that they have not experienced during early development. Moreover, on days 211 and 212, birds immediately accepted straw as a foraging substrate, and foraging occurred with equal frequency on straw and shavings, indicating that hens rapidly adjust to novel substrates and that foraging behaviour is not influenced by previous

experience. Whilst early substrate imprinting directs juvenile behaviour, and birds revise their substrate preferences, so that adult foraging behaviour is guided by preferences acquired after the early "sensitive" period. However, the experiment was not designed to test specifically when this sensitive period occurs. Therefore, it is recommended that a suitable substrate be provided at all time, in order to prevent birds from developing alternative preferences for pecking at feathers.

McKeegan et al. (2001) investigated experimentally whether dietary protein source has any effect on the development of feather pecking and cannibalism in commercial layer pullets, by rearing birds on isonitrogenous and isocaloric diets based on either plant protein (mainly soyabean meal) or animal protein (containing fishmeal). One hundred and forty-four pullets were allocated at random on the day of hatch into 12 groups of 12 chicks, with six groups per treatment. The effects of dietary protein source were determined, from two to 24 weeks of age. Time spent on bird to bird pecking (aggressive and non-aggressive) was significantly higher in plant protein groups between six to ten weeks of age, and the counts of vigorous pecks/pulls were significantly higher in plant-protein groups at 13 to 16 weeks. This suggests that damaging pecking is promoted by plant-protein-based diets. However, it remains unclear whether the observed effects on pecking behaviour were due to the absence of something beneficial in animal protein or the presence of detrimental substance in plant protein. Therefore, whether animal protein sources can be totally excluded in the diets of commercial layers with plants being the only protein sources still remains a question.

## Conclusion

Early substrate exposure, social transmission, and dietary protein source have been shown to affect the behaviour of feather pecking in laying hens in the three recently published papers. However, the exact influences of these factors on the behaviour are not clear, because of the limitations of the experiments. Therefore, further studies on this issue should be carried out, in order to promote the welfare of commercial laying hens, by modifying the current husbandry systems.

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