

Feather pecking in laying hens, is selected breeding the answer?

By Katrina Goldsmith

Introduction

As an increasing proportion of laying hens are being housed in systems alternative to cages, the issues of feather pecking and cannibalism have become of an increasing concern as both economic and welfare problems. Over the past ten years considerable studies have been conducted into causes and factors influencing the frequency of this damaging behaviour. Recently there has been significant research into the genetic component and heritability of this trait. This essay will deal with the feasibility of using selective breeding as a means of decreasing the occurrence of these behaviours within intensive egg production systems.

Feather pecking: What is it and why is it a problem?

Feather pecking is a behavioural disorder in poultry that involves a hen pecking at or pulling out the feathers of another hen. Kjaer, Sorensen and Su, (2001), and McAdie and Keeling, (2000), further separated this behaviour into two distinct forms of feather pecking; gentle pecking, where the feathers are nibbled at but not pulled out, and severe pecking, where the hen pulls at a feather or a number of feathers possibly resulting in removing one or more of the feathers. Both studies regarded the gentle pecking to be a redirected exploratory behaviour, and the feather pulling to be an abnormal behaviour. Klein, Zeltner and Huber-Eicher, (2000), demonstrated that foraging behaviour could be redirected towards feather pecking by observing feather pecking behaviour in enriched and restricted environments.

Feather pecking is considered to be a welfare problem due to the pain experienced when feathers are being pulled out and also due to the increased likelihood of cannibalism resulting (McAdie et al. 2000). Kjaer et al. (2001), defines cannibalism as pecking resulting in skin or other tissues being damaging and suggests that this may occur as the final stage of severe pecking. While McAdie et al. (2000), found no correlation between hens involved in feather pecking behaviour and cannibalism they conclusively showed that feather pecking was likely to increase the incidence of cannibalism in a flock. The study showed that areas of bare skin, which could be produced by feather pecking, acted as a stimulus for cannibalistic behaviour.

Feather pecking is of particular concern in loose-housing systems due to the fact that the misdirected pecking by one hen can affect a greater number of birds than in caged systems, (McAdie et al. 2000). Kjaer, (2000), suggests that the incidence of these damaging behaviours in loose-housing systems may offset the benefits gained from this type of housing, such as wing flapping, flying, running, exploration, scratching, dustbathing and nesting that is not possible within the confines of a caged system. It is therefore necessary to find ways of decreasing feather pecking in hens to enable them to be housed in an environment that satisfies their behavioural needs.

Is there genetic variation in feather pecking behaviour between commercial strains?

Kjaer, (2000), showed statistically significant differences in feather pecking behaviour and plumage quality in four strains of commercial layers. This study observed feather pecking behaviour over a 7hr time period in 10 min time periods in Lohmann Selected Leghorn, Norbrid, Lohmann Brown and ISA Brown. A qualitative study was also done on plumage quality at various time intervals. The results showed a statistically significant difference in the number of pecks and bouts of pecks observed per hour between the different strains indicating a genetic component to the behaviour. (A bout is a series of pecks directed at an individual hen at a particular time.) The study also showed a statistically significant difference in plumage condition at 29, 42, 51 and 69 weeks. However differences in plumage quality did not correlate with the incidence of pecking indicating that, according to this study, plumage

quality is not an accurate indicator for the frequency of feather pecking behaviour within a population.

Klein et al. (2000), showed that there were genetic differences in both foraging behaviour and feather pecking behaviour between Lohmann Selected Leghorn and Dekalb. In contrast to Kjaer, (2000), this study used only behavioural observations to determine feather pecking behaviour. The differences in behaviour due to environmental influences were shown by a comparison of enriched and restricted environments. When placed in an impoverished environment the two strains developed feather pecking at different intensities, indicating that there was a difference between the strains in feather pecking behaviour and their response to changes in environment. While this study showed that there is a statistically significant genetic component to feather pecking behaviour, it also demonstrated that environmental factors were more influential to this behaviour than breed differences.

Can selective breeding be used to produce a low pecking strain?

Having just said that environmental factors such as enriched environments are significantly better at reducing feather pecking behaviour, (Klein et al. 2000), it may be considered somewhat futile to attempt to use genetic means to decrease feather pecking behaviour. However, commercial viability is an unfortunate necessity of any attempt to reduce this behaviour and it is therefore necessary to consider all options of decreasing this behaviour and providing a way to increase the welfare of these birds in an economically sustainable way. Kjaer et al. (2001), utilised divergent selection over 6 hatches in 3 generations to produce statistically significantly divergent strains. In this selection experiment estimated breeding values were calculated for individual birds on the basis of the number of bouts per hour. While the selection was obviously effective in changing feather pecking behaviour, with an estimated heritability of 0.2, there was no effect on the amount of aggressive behaviour found. This agrees with the finding of McAdie et al. (2000), that hens exhibiting cannibalistic tendencies were not associated with feather pecking. Kjaer et al. (2001), found a positive correlation between plumage quality and pecking behaviour in contrast to the previous study, Kjaer, (2000).

Conclusions

Due to the differences in feather pecking between different strains of laying hens, and the significant divergence between strains demonstrated by Kjaer et al. (2001), it appears that selective breeding against feather pecking behaviour may provide an economically viable means of increasing the welfare of these birds. Further studies are needed into the effect this selection will have on production levels. Klein et al. (2000), demonstrated the superiority of environmental influences on feather pecking behaviours. Thus manipulation of environmental conditions would be needed in conjunction with genetic selection to provide the best possible welfare conditions.

Bibliography

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