Commercial laying hen chicks experience continuous light for up to 24 h/day in the first week of life. Under these conditions, active chicks disturb, and may direct feather pecks towards resting ones. Previous experimental work with small groups showed that both problems were reduced in chicks brooded by dark brooders (heaters). The current study aimed to extend these small-scale trials by examining the use of dark brooders on two commercial rearing farms. Each farm contributed two identical houses, one of them equipped with dark brooders and the other with regular brooders. The experiment comprised five replicates, each consisting of one dark brooder flock and one control flock (total of 10 flocks). Each flock contained 2000 Columbian Blacktail chicks with intact beaks, which were reared to organic standards. Observations took place three times during the rearing period at 1, 8 and 16 weeks and three of the five replicates were also followed into lay, with observations at 25 and 35 weeks. Bird weights, the evenness of body weight, mortality at the end of rear, feather pecking, the percentage of the flock with missing feathers and individual feather scores were measured, as well as the flock’s reaction to a novel object and an approaching human in selected areas of the house. Apart from mortality, which was analysed as a paired t-test in PASW Statistics 18, data were ordered in three (or four) levels (visits within (flock within) replicate within farm) and were analysed using the multilevel statistical software MLwiN 2.25. Treatment and age were entered in the model as explanatory variables. On average, across observations taken at all ages, dark brooder flocks performed significantly less severe feather pecking than control flocks ($\chi^2 = 12.215$, df = 1, $P = 0.0005$) and had a significantly lower percentage of birds with missing feathers ($\chi^2 = 7.380$, df = 1, $P = 0.007$). Individual feather condition deteriorated faster in the control treatment (treatment $\times$ age2: $\chi^2 = 12.148$, df = 1, $P = 0.0005$). There was also an interaction between treatment $\times$ age for weight ($\chi^2 = 11.087$, df = 1, $P = 0.0009$) which meant that dark brooded birds ended up slightly heavier than birds from the control treatment. Mortality at the end of rear, gentle feather pecking and evenness of the weight were not measurably affected by treatment. The novel object and human approach test gave mixed results. In conclusion we found no detrimental effects of dark brooding on commercial farms and suggest this is a promising approach to reducing problems with feather pecking and generally improving the welfare of commercial pullets.


Abstract Although the rearing period has an important influence on the development of feather pecking in laying hens, few studies have quantified the risk factors operating on commercial farms during this time and identified their long-term impact. Our aim was to conduct a longitudinal study to investigate the effect of rearing environment on feather pecking in young and adult laying hens. Thirty-four flocks from 29 rearing farms were recruited and visited at the beginning, middle and end of the rearing period and once at lay (35 weeks). Twelve flocks were dark brooded. Information on rearing environment was used to create models predicting feather pecking and plumage damage during rear and lay, using the multilevel statistical software MLwiN 2.25. Across all flocks, gentle feather pecking (GFP) was observed during 94% of the visits at both rear and lay, at 1.3 and 1.0 bouts/bird/h respectively. Severe feather pecking (SFP) was observed during 27% of the visits during rear and during 65% of the visits at lay, with a mean rate of 0.4 pecks/bird/h during rear and 1.9 pecks/bird/h at lay, across all flocks. The mean percentage of the flock with missing feathers was 12% at 16 weeks and 49% at lay. The mean individual feather score at lay was 21 (range 6–24 (best)). The study confirmed that feather pecking and feather damage occur during the rearing period. Statistical modelling further showed that the percentage of the flock with missing feathers was significantly lower and individual feather scores significantly higher (better) at lay, in flocks where feather pecking had not started at the end of rear. The three models on the effect of rearing environment on GFP, SFP and the percentage of the flock with missing feathers during rear contained 21 significant variables. Approximately a third of those related to house climate (temperature, humidity, sound, light and dust levels), while another third related to foraging. Foraging itself appeared in all three models, confirming that good foraging is one of the major factors in reducing feather pecking. The four models on the effect of rearing environment on GFP, SFP, the percentage of the flock with missing feathers and individual feather scores at lay contained 17 significant variables and sound level was significant in three of the four. The analysis further indicated that experienced rearing staff was protective against feather pecking at both rear and lay and that feather pecking increased with an increasing number of diet changes during rear.


Several studies have shown that the tendency to feather peck is influenced by events early in life and preventive measures should therefore be introduced at hatching. Separating inactive chicks from active chicks by providing dark electrical brooders was predicted to reduce the risk of chicks developing pecking preferences for conspecifics. Twelve groups of 15 layer hen chicks (Lohmann Tradition) were reared in pens (2.55 m$^2$); during the first 5 weeks after hatching six pens were provided with dark brooders and six pens with heating lamps. All pens were observed continuously for...
Injurious pecking remains one of the biggest animal welfare and economic challenges for free-range egg producers. This prospective epidemiological study investigated the development of vent pecking (VP) and cannibalism in 62 free-range and organic UK farms (119 flocks). Flocks were visited at 25 ± 5 and 40 ± 5 weeks of age. Rates of VP were recorded and farmers were asked whether they had observed cannibalism in their flocks. Environmental factors were collected for each flock. Risk factors associated with these behaviours were modelled using MLwiN. VP was observed in 19.5 and 29.9% of flocks, at mean rates of 0.35 and 0.21 bouts per bird per h, at 25 and 40 weeks, respectively. Cannibalism was reported at 22.6% of visits. The odds of flocks showing VP or cannibalism increased with rate of severe feather pecking (SFP). VP was more likely to be observed in laying houses with more and/or longer pop holes and where feed was scattered on the floor. Providing more aerial perch length, or perches > 0.5 m in height, was associated with increased risk of VP. Providing more aerial perch length, or perches > 0.5 m in height, was associated with increased risk of VP. When SFP was excluded from the model, likelihood of VP was higher in flocks fed pelleted feed. All of these may provide a useful basis from which to derive management strategies to reduce the risk of VP and thus improve the welfare of laying hens. However, it is important to remember that this study does not elucidate the causal relationships between these variables, and further work is needed to understand the mechanism behind these associations.


Movement (frequency of changes) between inside and outside housing areas, time spent in each area, tonic immobility (TI) and differential blood cell counts were studied in relation to feather condition in laying hens of two genotypes, white (LSL) and brown (LT). From 18 weeks of age, LSL and LT were kept in 4 groups of 50 birds in a poultry house with passages to a roofed scratching room and a grassland area with a stocking density of one bird/10 m<sup>2</sup>. All birds had transponders to record the movements of each hen between inside and outside areas and the time spent in each area during 24 h. Feather scoring was carried out at 6 ages from 20 to 48 weeks. At 44 weeks of age, TI reactions of 40 hens (20 from each genotype) were quantified and blood smears from 20 hens (10 from each genotype) were analysed for differential leukocyte counts. LSL hens moved more frequently to outdoor areas than LT hens (44.66 <i>vs</i> 28.78 least square/d). However, the proportion of time spent on grassland was greater in LT than in LSL hens, whereas time (%) spent by LT hens in the roofed scratching area was less than for LSL hens. In LT hens TI was shorter while heterophil/lymphocyte ratio and basophilia were greater than in LSL hens. Total body feather score was poorer in LSL than in LT hens. Incidence of footpad inflammation was higher in LSL than LT hens. There was a positive association between TI and footpad inflammation. The percentage of time spent on grassland and feather damage were inversely correlated. More movement between the areas, as in LSL hens, was positively associated with fearfulness, whereas longer periods on grassland, as in LT hens, were associated with indicators of increased stress. The negative correlation between feather damage and time spent outside suggests that feather pecking risk decreases in birds attracted to grassland.

aviaries or percheries. There is a continuous effort of many research teams in Europe and elsewhere to expand our knowledge of this behavioural disturbance and maximize the chances to solve the problem. In this review we have attempted to summarise the present status of knowledge about feather pecking. Hypotheses on causation (redirected ground pecking or dustbathing), environmental factors (feeding, lighting, housing, group size, density) and endogenous factors (sex, age, genetic factors, physiological control mechanisms) are discussed and possible ways of prevention via changing environment, management practices or genetic selection are pointed out.