Development of perching behaviour and its impact on feather pecking and floor laying

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Individual development of perching behaviour in chicks reared in enriched environment

Behaviour problems in loose housing systems for laying hens may originate from the rearing period, although the actual problems occur mostly during the laying period. Early access to perches facilitates the use of three-dimensional space and therefore allows escape from threatening situations. Aim of our first study was to investigate individual differences in perching behaviour and if environmental enrichment enhances perching at an early age.

Ninety LSL-chicks (day-old) were randomly allocated into 18 pens which had a similar perch arrangement and were either A) controls, or had B) floor enrichment [four wooden blocks (400*100*50mm) on the floor located so that chicks were unable to jump straight from the blocks to the perch] or C) hanging enrichment (four objects hanging from the roof so that chicks could interact with them). The behaviour of the chicks was observed directly for 6 weeks, 12 times a day. Data was analysed with a mixed model ANOVA and a survival analysis.

It appeared that the chicks in group B started to perch earlier (13.8d) than in groups A (17.3d) and C (16.6d), although the difference was not significant (p = 0.12). Time spent under the perches was negatively related to the day when chicks were first observed on a perch (p < 0.05), whereas interacting with other chicks was positively related (p < 0.05) to that day.

Chicks tended to start perching earlier if they were able to train the rise with the wooden blocks. They started to perch earlier if they spent more time under the perches during the first weeks investigating the pen environment instead of just being under the heating lamp. Interestingly, the less a chick interacted with other chicks the earlier it was found perching, supporting the fact that a fearful chick considers the perch as a safe place to escape from threatening situations.

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Effect of light source and day length on diurnal behaviour of chicks

One reason for variable night-time perch use in commercial layer hens might be the short light-period during the rearing period. Growing chicks may prefer to rest on the floor during the night-time, if they do not have enough time to feed during the day-time. In organic egg production, natural light is compulsory during the laying period. However, there is little knowledge about the effect of different light sources on behavioural development. The aim of the second experiment was to study the effect of different light rhythms and light sources on the diurnal time budget of the layer chicks.

126 LSL-chicks were divided into 3 treatments (in total 18 pens): 1) A8: 8 hours artificial light + 16 hours dark, 2) A16: 16 hours artificial light + 8 hours dark and 3) N8: 8 hours natural daylight + 16 hours dark. Chicks were video recorded between 6 and 12 weeks of life. Perching and feeding data were scored using scan sampling (5 min interval). The age of onset of night-time perching in the groups was analysed by Cox proportional hazards modelling, and daytime and night-time feeding behaviour in the groups were analysed by one-way ANOVA.

There was a tendency of N8-birds starting night-time perching earlier than A8-birds (P=0.056; hazard ratio=8.5). No significant difference in perching onset between A8- and A16-birds was found. A8 and N8-birds did not differ in their feeding behaviour, whereas the mean proportion of A16-birds feeding was 0.056 lower than in A8-birds in daytime (P=0.0004) and 0.019 lower in night-time (P<0.0001).

These results suggest that chicks can change their diurnal feeding behaviour depending on day length, but that 16 hours of darkness might be too long without feeding. The total amount of time used for daytime feeding appeared to be unaffected by the time available for feeding. Natural daylight was found to precipitate the start of night-time perching.

Light source preferences in laying hens

The effect of early exposure to natural light may have an effect on the later preference of light type and on the behaviour of the birds after transferred to the laying facilities. The aim of the third experiment was to study the light type preference in laying hens reared in either artificial or natural light.

126 LSL-chicks were divided into 3 light treatments (6 groups each): 1) A8: 8 hours artificial light + 16 hours dark, 2) A16: 16 hours artificial light + 8 hours dark and 3) N8: 8 hours natural light + 16 hours dark. At the age of 14 weeks, the birds’ light type preference was tested on group level. Birds were video recorded;
for 4 hours before reversing the sides of light sources and recording for another 4 hours.

N8, A8 and A16 birds chose natural light 37, 15 and 11% of the time, respectively. Thus, birds reared in natural light chose natural light most often, but in none of the treatments, the birds chose natural light more often than artificial light. Birds in treatment A16 and A8 spent significantly more time in artificial light in the test, i.e. the proportion of birds preferring artificial light differed significantly from 0.5 (P<0.0001 and P=0.0002, respectively). Furthermore, it was found that birds reared in natural light did not show a significant preference for daylight compared to artificial light, although they had a 2.7 times higher probability to choose natural light (p=0.02) compared to birds reared in artificial light (A8).

These results imply that pullets for organic egg production with access to daylight should be reared with access to daylight, and that birds reared with access to natural light might be more adaptable to a changing light environment. However, long-term studies of development of the light preference of laying hens has to be done in order to draw general conclusions about how the light during rearing is influencing the adult hen.

Effect of early access to perches on later behaviour in commercial conditions
In the last part of our studies, the effects of early access to perches on the floor laying, perching behaviour and feather condition of the chicks in a commercial setting were investigated.

Altogether, 7200 birds (study included LSL-, LB- and LT-birds) were used in the study. Birds were on the study from one-day old until they were 32 weeks old.

Each batch (altogether 3 batches) of chicks was divided into six groups, from which half was reared in a control environment and half with perches. Between 6 and 17 weeks of age, all groups were treated the same way. From 17th week onwards, all groups had also access to nest boxes.

During the pullet rearing (6-17 weeks of age), we were looking at the night-perching every third week. Night-perching observations were continued during the laying period (17-35 weeks of age). We were also looking at the prevalence of mislaid eggs (floor eggs), which should be greater in control groups, since it might be more difficult for control birds to use the elevated nest boxes. We were also able to compare the treatments in upper nest box use (nest boxes are provided in two tiers in some of the pens), which might indicate the ability of hens to use
three-dimensional space. At the age of 32 weeks, we conducted a hen scoring for 20 hens per group to see if the treatment had a positive effect on the feather condition. Results of this last study part are yet to be analysed.

References


Heikkilä M., Gunnarsson S. and Valros A. Effect of day-length and natural vs. artificial light on the diurnal rhythm of layer chicks. Manuscript.