Can substrate in early rearing prevent feather pecking in adult laying hens?

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Abstract

In The Netherlands, laying hen chicks are often reared without litter on the raised slatted area of a barn system or confined in the aviary system during the first two to five weeks after hatching, with chick paper or chicken wire on the floor. In the absence of a suitable pecking substrate, chicks may redirect their pecking behaviour to other birds, which possibly increases the risk of developing feather-pecking behaviour. The aim of this study was to determine whether housing on wood-shavings (WS treatment; n = 15 groups) as compared to housing on chicken wire (CW treatment; n = 15 groups) between day 1–20 could reduce feather pecking in adult birds. After day 20, all chickens were allowed wood-shavings as litter. Behavioural observations showed that CW chicks performed significantly less ground-pecking behaviour compared with WS chicks up to day 20. More CW chicks showed gentle feather pecking at day 7 and 14 as compared to WS chicks, and more CW chicks pecked at the feeder or drinker than WS chicks up to day 20. CW chicks showed rebound behaviour: the day after they were introduced to wood-shavings they displayed more ground-pecking behaviour compared to the WS chicks. Later on in the rearing period no noticeable differences between treatments were found in frequency of gentle and severe feather-pecking bouts. During laying, more gentle feather-pecking bouts were observed in CW than in WS groups but no differences in severe feather-pecking bouts were observed, nor in feather damage at the end of the trial. The results indicate that hens can display substantial flexibility in their pecking behaviour and that, despite more gentle feather pecking in CW hens in laying, the absence of substrate in early rearing does not increase the risk of developing severe feather-pecking behaviour when adult.

Keywords: animal welfare, feather pecking, ground pecking, laying hens, ontogeny, substrate

Introduction

A substantial body of research has been carried out on management practices that reduce the risk of feather pecking in commercial laying hen systems. Beak trimming (eg Lambton et al 2010) and reducing the light intensity (eg Drake et al 2010) are often used to control feather pecking in commercial flocks. However, very low light intensities impair eye development and visibility (eg Kjaer & Vestergaard 1999; Prescott et al 2003). Hot-blade beak trimming raises welfare problems in its own rights, such as being painful and causing morphological changes (eg Freire et al 2011) and infra-red beak trimming, although considered more welfare-friendly as compared to hot-blade trimming, can be further optimised (Dennis & Cheng 2012). Several studies stressed the importance of rearing conditions in the development of feather pecking in adult hens (eg Van de Weerd & Elson 2006; Bestman et al 2009). A reduced stocking density, availability of litter of good quality and environmental enrichment in rearing reduce the risk of development of feather pecking (eg Van de Weerd & Elson 2006; Bestman et al 2009). In the laying period, for example, range use, the type of breed, feed form and access to litter have been identified in epidemiological studies as important factors in the development of feather pecking (eg Green et al 2000; Nicol et al 2003; Lambton et al 2010).

Although risk factors have been identified, research is ambiguous on the influence of the effect of substrate in the early rearing period. It has been suggested that the substrate used during early rearing may affect the risk of development of feather pecking when adult (Johnsen et al 1998; Dixon 2008). In particular, it has been suggested that substrates which promote foraging may reduce the risk of feather pecking. Huber-Eicher and Wechsler (1997) showed that providing chicks with a dustbathing substrate (sand) did not prevent feather pecking, but providing sand as well as long straw (dustbathing and foraging substrate) did prevent feather pecking, although observations were only given up to week 7. Hens reared in aviaries that had substrate (wood-shavings, straw) in the first two weeks showed less feather pecking at 5 and 14 weeks compared with hens that were housed on wire in the first two weeks, however, no observations were performed in adult hens (Huber-Eicher & Sebő 2001). Chicks raised in exploratory stimuli-rich environments in the first five weeks of life also showed reduced...