

**Light & larvae as early-life interventions to prevent feather pecking in laying hens**

Saskia Kliphuis<sup>1\*</sup>, Maëva WE Manet<sup>1</sup>, Vivian C Goerlich<sup>1</sup>, Rebecca E Nordquist<sup>1</sup>, Frank AM Tuytens<sup>2,3</sup>, T Bas Rodenburg<sup>1,4</sup>

<sup>1</sup> *Animals in Science and Society, Department of Population Health Sciences, Faculty of Veterinary Medicine, Utrecht University, Utrecht, Netherlands*

<sup>2</sup> *ILVO, Mellebeke, Belgium*

<sup>3</sup> *Faculty of Veterinary Medicine, Ghent University, Ghent, Belgium*

<sup>4</sup> *Department of Adaptation Physiology, Wageningen University & Research, Wageningen, Netherlands*

\*Presenting author: [s.kliphuis@uu.nl](mailto:s.kliphuis@uu.nl)

Severe feather pecking, the pulling out of feathers of conspecifics, is a maladaptive behaviour shown by laying hens, and causes significant welfare issues in commercial laying hen farming. Possible underlying causes are fearfulness and lack of foraging opportunities. As early life is a crucial stage for behavioural development, adapting the incubation and rearing environment to the birds' behavioural needs may prevent the occurrence of feather pecking. In a 2\*2 factorial design study, we investigated the effect of a green light-dark cycle throughout incubation, resembling more natural incubation circumstances, and of foraging enrichment with live larvae during rearing on fearfulness and feather pecking. As green light during incubation was shown to reduce fearfulness in broilers, and enrichment with larvae could fulfill the birds' behavioural need to forage, we hypothesized that chickens receiving both light and larvae would be the least fearful and show the least feather pecking compared to no light and no larvae. Divided over two rounds of experiments, 1100 ISA Brown eggs were incubated either under 12:12h or 0:24h light-dark conditions. After hatch, 400 female chicks were housed in 44 pens (8 to 10 chicks per pen). During the entire rearing phase, half of the chicks received black soldier fly larvae in a food puzzle as enrichment. Treatments were not mixed within pens. To assess fear of humans, we carried out an approach test on pen level at 10 weeks of age. To assess feather pecking, we performed home pen observations at 5 weeks and scored feather damage at 16 weeks of age. Data were analyzed using means per pen. A Cox regression with factors light, larvae and interaction showed no effect of lighted incubation (HR=1.957, p=0.117) nor of larvae provisioning (HR=2.182, p=0.077) on latency to approach. No interactions were found between treatments. A GLM with light, larvae and round as fixed factors showed that feather damage was not affected by light (F=1.063, p=0.309) nor larvae (F=0.742, p=0.394). Treatments did not significantly affect the number of feather pecking bouts (Kruskal Wallis: H(3)=3.001, p=0.392). In conclusion, the present study showed little effect of light during incubation or larvae enrichment during rearing so far, but analysis of additional behaviour tests is still ongoing. This experiment was part of PPILOW (Poultry and PIg in Low-input and Organic production systems' Welfare, [www.ppilow.eu](http://www.ppilow.eu)). The PPILOW project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement N°816172.