

## Maternal care and selection for low mortality affect serotonergic activity and corticosterone response to manual restraint

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Feather pecking and cannibalism are major welfare problems in laying hens. The likelihood of a bird developing feather pecking is influenced by its personality traits, for instance by how an animal copes with fear and stress. Genetic selection and early rearing conditions can affect these personality traits, and in this way also affect feather pecking and cannibalism. Therefore, the aim of the present study was to investigate the effect of maternal care and of selection for low mortality on personality traits. Birds in the experiment originated from the same population and were either selected for low mortality in groups (low mortality line) or randomly selected (control line) for two generations. Fourteen groups of 10 birds from each line were used. Within each line, seven groups were brooded by a foster mother and seven groups were non-brooded. At 33 weeks of age, seven birds from each group were tested in a manual restraint test. They were restrained for five minutes, during which their behavioural response (number of struggles) was studied. After manual restraint, birds were placed individually in a crate for 10 minutes. After 10 minutes, blood samples were drawn for assessment of plasma corticosterone and whole blood serotonin (5-HT) concentration. For half of the birds, i.e. 16 birds per treatment, also platelet 5-HT uptake velocity was determined. Data were analysed using a GLM-procedure, testing effects of line, mother and their interaction. In the low mortality line, 80% of the birds struggled and vocalised versus 72% in the control line (NS). Birds from the control line had a stronger corticosterone response to manual restraint (7.7 vs. 6.0 nmol ml<sup>-1</sup>; F<sub>1, 19</sub> = 5.79; P < 0.05). Furthermore, birds from the low mortality line that were reared without a mother had a higher 5-HT concentration in their blood than birds from the other treatments (48 vs. 45 nmol ml<sup>-1</sup>; F<sub>1, 19</sub> = 5.51; P < 0.05). Within the groups reared with a mother, there was a tendency for a lower 5-HT uptake velocity in the low mortality line compared with the control line (571 vs. 749 pmol/109 thr/min; F<sub>1, 19</sub> = 3.33; P < 0.10). These results imply that maternal care and selection for low mortality affect serotonergic activity and corticosterone response to restraint. These factors may be involved in a reduced propensity to develop feather pecking and cannibalism.

**Keywords:** genetic selection, feather pecking, cannibalism, corticosterone, serotonergic system