

## Effects of early life experience on the adaptation capacity during infectious challenges; laying hens as a model animal

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The aim of this study was to investigate whether the adaptation capacity of rearing hens during infectious challenges can be influenced by manipulation of early life conditions. Chicken embryos (Lohmann Brown) were exposed to either an egg shell temperature (EST) of 36.7°C in wk1, 37.8°C in wk2 and 38.9°C in wk3 of incubation (standard incubation; n = 176) or an EST of 37.8°C continuously (optimal incubation; n = 176). After hatch, chicks from the optimal incubation treatment were transported to a room at 34°C, with access to feed and water, while standard incubated chicks remained in the incubator to simulate commercial circumstances. All chicks were vaccinated against infectious bronchitis (IB) and Newcastle Disease (NCD). Until week 7, half the chickens of both incubation treatments were reared in cages (conventional treatment), the other half in floor housing with litter and perches (enriched treatment). Housing conditions were equal from week 7 until 15. All chickens were challenged with a coccidiosis and infectious bronchitis infection at 8 and 13 weeks of age, respectively. Read-out parameters were intestinal lesions due to coccidiosis and IB antibody titres. Data was analyzed using a Chi-square and GLM procedure respectively. Results demonstrated that an enriched environment significantly decreased the severity of intestinal lesions ( $P < 0.05$ ) and IB antibody titre ( $P < 0.05$ ). These data suggest that the adaptation capacity during infectious challenges can be influenced by early life rearing conditions, possibly due to early stimulation of the immune system by micro-organisms already present in an enriched environment.

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