

Genetic analysis of individual nesting and free-range behaviour traits in layers

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Data regarding free-range, nesting behaviour and laying performances of each individual hen were automatically recorded from three flocks of different strains (N = 256 to 337) in an aviary system. The technical equipment which was used for this automatic data recording is the Weihenstephan Funnel Nest Box and Electronic Pop Hole (Thurner, 2006). Two different strains were tested: two brown layer flocks (Lohmann Silver, LS), and one white layer flock (Lohmann Selected Leghorn, LSL). There were differences in nesting behaviour between these strains. Compared to the LSL hens, the LS hens started laying eggs up to two hours earlier in the morning and more widely spread throughout the day. One to two hours after onset of light, up to 37 % of the hens went out to the adjacent winter garden before coming in again to lay their eggs. Without any significant differences between the strains, the average frequency of passages varied from 13 to 19 times per hen and day. Genetic analysis showed moderate heritabilities for the nesting behaviour traits: duration of stay with oviposition ($h^2 = 0,27$) and oviposition time ($h^2 = 0,23$). Estimated negative genetic correlations between the duration of stay in the single nest box and the frequency of passages, showed that hens which spent a longer time for laying an egg in the nest box, paid lesser visits to the winter garden and did not spend so much time outdoors. In addition, it seems that these hens have a slightly better laying performance due to a negative genetic correlation between the frequency of passages and the egg number which has to be confirmed in further analysis with a higher number of tested hens.

Keywords: layers, nesting behaviour, free-range