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Comparison of Live Body Weight, Fluctuating Asymmetry, and Location Effect on Behavior in Laying Hens Reared on Litter Floor with or without Access to Different Plant Compositions

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Abstract

In this study, Lohmann LSL Classic and Lohmann Sandy strains were housed in litter floor pens without (LF: four replicate pens per strain) or with access to outside pens covered with *Petroselinum crispum* (PC), *Mentha piperita* (MP), and *Medicago sativa* (MS): three replicate pens per strain. LF hens stayed completely indoors from 4 to 52 weeks of age. For the PC, MP, and MS groups, accessibility to outdoor pens began from 12 to 52 weeks of age, daily and continuous between 8:30 a.m. and 15:30 p.m. Live body weight (LBW) data was obtained after weighing birds (n = 52) at 31, 42, and 52 weeks of age. Behavior observation was conducted at 32, 42, and 52 weeks of age, but the data was pooled for a more precise estimate. Fluctuating asymmetry (FA) in bilateral traits was assessed at 52 weeks of age (n = 52). LBW was increased with the aging of birds ($P<0.001$), higher in LS strain than LW strain ($P<0.001$), but similar among the housing environments ($P>0.05$). FA of all the 13 measured bilateral traits was similar between strains ($P>0.05$), but a larger FA of face length in MP hens than in other groups was observed ($P = 0.012$). Also, the strain*housing system interaction effect nearly reached a significant level ($P = 0.064$) for face length, with larger FA in LW hens housed in the MP environment than in other groups. The percentage of birds that were standing, walking, foraging, dust bathing, pecking objects, stretching and wing flapping was higher outside than inside. However, more pecking of other hens and preening behaviors were expressed inside than outside ($P<0.01$). This research confirms strain differences in live body weight and location effect on the expression of many behavioral repertoires in birds. It, however, demonstrates no strain and housing environment disparity in the fluctuating asymmetry of bilateral features.

Key Words: behavior, housing environment, layer chicken, welfare, bilateral traits