

Barrier perches and density: effects on perching, leg condition and foot health in broilers

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Deterioration of leg and foot health is a main welfare concern facing modern broiler production, particularly when birds are kept at high densities. It has been argued that environmental enrichment may help resolve these issues. We hypothesized that access to barrier perches across a range of densities may improve leg and foot health by providing perching opportunities. To assess this, 2,088 day-old broiler chicks were randomly assigned to one of the following barrier and density treatment combinations over four replications: simple barrier, complex barrier, control (no barrier) and low (8 birds/m²), moderate (13 birds/m²), or high (18 birds/m²) density. Perching data were collected from 4-6 weeks of age by recording the number of individuals perching on barriers at each observation period. At the end of rearing, data were collected on average tibia width (TW) and length (TL), fluctuating asymmetry of TW and TL, footpad and hock lesions, feed conversion, mortality, and final body weight. Perching data were analysed with a mixed model ANOVA with week as the repeated measure, mortality with the GLM procedure, and footpad and hock lesion scores using 967; 2 analysis. All other data were analysed with a mixed model ANOVA. Results revealed a strong age:density effect on perching ($P<0.0001$). Perching decreased in all density treatments over time ($P<0.0001$), but the decline occurred earlier in high density as compared to low and moderate density pens ($P<0.0001$). A maximum mean perching of 21% was observed in low density pens in week 4. High density increased the severity of footpad ($P<0.0001$) and hock lesions ($P<0.0001$). Tibias were also longer ($P<0.0001$) and less symmetric in length at higher densities ($P<0.05$). In contrast, tibia width was more symmetric as density increased ($P<0.05$). Birds raised in complex barrier pens tended to show more symmetry in tibia length compared to controls ($P=0.056$). While barrier treatment had no effect on hock burn ($P>0.05$), simple barriers significantly reduced the severity of footpad lesions ($P<0.05$). Final body weight, feed conversion, and mortality were not affected by any treatment combination ($P>0.05$). As observed previously, high densities had a negative impact on behaviour and leg health. The observed high perching and improvement in foot health suggests that simple barriers may provide key welfare benefits to birds.

Keywords: broiler, barrier perch, welfare, density