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Space needs of broilers

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Abstract

There is continuing debate about the space needs and requirements of broiler chickens, The aims of this study were to measure the amount of floor area a six-week-old broiler occupies for different behaviours and to use the obtained results in two models to estimate the number of birds that can be kept per m^2 in large flocks simulating different levels of behavioural synchronisation. Photographs were taken of overhead projections of broilers (2.468 kg on average) kept in floor pens of 1 m^2 with either eight (low density) or 16 birds (high density) per pen. Individual body space was measured from these photographs for seven behaviours. Posture and density affected body space of the behaviours idle, drinking, and ground pecking. The first model, computing space needed per bird performing a behaviour in relation to flock size, showed that 15.3–15.7 birds m^{-2} (37.8–38.7 kg m^{-2}) can be housed maximally, based on low density measurements and 18.5–19.4 birds m^{-2} (45.7–47.9 kg m^{-2}) based on high density measurements. The second model, computing stocking density based on synchronisation of behaviour and body space, showed that 13.7–15.9 birds m^{-2} (33.8–39.2 kg m^{-2}) can be housed maximally based on low density measurements and 15.4–18.6 birds m^{-2} (38.0–45.9 kg m^{-2}) based on high density measurements. Results based on high density measurements implied that birds are compressed. Given the restrictions of a limited number of behaviours and no inclusion of movement and social interactions in the models of this study, stocking density in large flocks should not exceed 16 birds m^{-2} (39.4 kg) because that would lead to compression of birds which will suppress opportunities for behavioural expression and therefore impair welfare.

Keywords: *animal welfare, behaviour, broiler chicken, modelling, space occupation, synchronisation*