Effect Of Shadowed Areas On Smothering Risk In Layer Hens

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Abstract

Smothering is a multi-factorial problem influenced by bird behaviour, flock dynamics, and environmental factors. While identifying the risk factors for smothering in Australian free-range layer poultry, flock managers consistently reported higher likeliness of outdoor smothering in shaded areas.

We tested the hypothesis that outdoor smothering deaths were more common in shaded areas of the range. This study used data from a three-year prospective cohort of 84 free-range layer flocks across three commercial organizations in eastern Australia. Digital models of the physical structure of poultry sheds were constructed using a Geographic Information System. The time (in 60-minute increments) in which each cell of a regular 1 metre^2 grid extending to 25 metres around each shed's boundary was in shadow was calculated using geometric shadow estimation procedures. The ratio of incidence rate of smothering deaths in shadow-positive and shadow-negative grid cells was calculated to provide an estimate of the unconditional strength of association between a shadow area and smothering death incidence rate. A mixed-effects Poisson regression model was used to control for the confounding effect of season.

For all three organisations the number of smothering deaths per 10,000 shadow positive grid cell hours was 1.8 (95% CI 1.8 to 1.9) times that of the number of smothering deaths per

10,000 shadow negative grid cell hours. The strength of the association between shadowed areas and outdoor smothering risk varied by each of the three organisations and shed within organisation.

Outdoor smothering control measures should be developed on an individual shed level basis.