Measuring foot-pad lesions in commercial broiler houses. Some aspects of methodology

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Abstract

For monitoring purposes there is a need for a protocol to measure foot-pad dermatitis (FPD) on-farm. Therefore, we studied the effect of number of birds sampled, number of locations sampled and sampling location in a broiler house on the accuracy of measurement, in order to construct a protocol that can be applied in practice. Samples were taken from eight commercial flocks (Ross 308) at up to ten locations with up to 25 birds sampled per location. Foot-pad lesions were scored in all birds for both feet using the Swedish scoring method. No significant differences in FPD score were found between the first five birds and all birds sampled at a particular location. Although locations near the walls did not differ in FPD score from locations in the central area of a house, the severity of foot-pad lesions was unevenly distributed over the house. A model was constructed showing the inaccuracy related to the number of locations sampled in the house and the number of birds sampled per location. The model shows that in situations with at least five locations differences in inaccuracy are relatively small when a total of 100 birds or more is sampled. Inaccuracy is largest in a flock with variation in foot-pad scores, as compared to flocks with little variation. The results of this experiment can be used to determine the optimal sample size in a commercial broiler house.

Keywords: animal welfare, broiler, foot-pad dermatitis, inaccuracy, on-farm monitoring, sampling method

Introduction

Foot-pad dermatitis (FPD) in broilers, also called pododermatitis or foot-pad lesions, is a contact dermatitis of the plantar surface of the birds’ feet (Greene et al. 1985). Foot-pad dermatitis is usually associated with wet litter (Shepherd & Fairchild 2010) in combination with high concentrations of ammonia (Greene et al. 1985). FPD is characterised by inflammation and necrotic lesions, ranging from superficial to deep in the plantar surface of the feet and toes. Deep ulcers may lead to abscesses and thickening of the underlying tissues (Greene et al. 1985; Shepherd & Fairchild 2010). It is likely that FPD causes pain and therefore has a negative effect on bird welfare, but because of its association with litter quality it also reflects other welfare aspects (Haslam et al. 2007).

The welfare of broilers is receiving increasing attention in Europe, which is illustrated by the European Council Directive laying down minimum rules for the protection of chickens kept for meat production (Council Directive 2007/43/EC 2007). Besides requirements on administration, light intensity and duration, air quality and training of the farmer, for example, the Council Directive restricts the maximum stocking density for broiler chickens. If all requirements are fulfilled and the mortality is kept below the maximum level stated in the Directive, farmers are allowed to keep their birds at a stocking density of 42 kg m⁻² if national legislation so permits (Council Directive 2007/42/EC 2007). Individual countries may choose to include additional welfare measures to the Broiler Directive in their national legislation. For example, in The Netherlands, foot-pad dermatitis will be included as an additional welfare indicator for broilers from 2012 onwards (Anonymous 2009). Denmark and Sweden already included foot-pad dermatitis as welfare indicator in their own broiler welfare legislation (Berg & Algers 2004; Pedersen, VFL, Denmark, personal communication 2011). In Denmark and Sweden, FPD is assessed at the slaughter plant by trained veterinarians or by assistants under veterinary supervision. A sample of 100 feet per flock is assessed according to a three-point scale, discriminating between no or very small lesions (score 0), mild and superficial lesions (score 1) and severe, deep lesions (score 2) (Ekstrand et al. 1998; Pedersen, VFL, Denmark, personal communication 2011). Assessing FPD at the slaughter plant has several advantages as compared to assessing FPD at broilers on-farm. The assessment does not cause stress to the birds as FPD is assessed at the plant after killing. As the feet have passed the scalding tank most of the litter and manure is removed, in contrast to rather dirty feet in commercial broiler houses. In addition, light conditions are often better and can easily