Scratch the surface: Histopathology of foot-pad dermatitis in turkeys (Meleagris gallopavo)

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Foot-pad dermatitis (FPD) is an important indicator of animal welfare in turkeys (Meleagris gallopavo). The present study aimed to evaluate the reliability and validity of a commonly used five-point visual score (VC), assessing FPD based on lesion size by implementing histopathological analysis. In 100 turkey feet (20 per scale scored by the VC), the size of both the foot-pad and the alteration were measured. Subsequently, a histopathological analysis was performed, examining the occurrence and severity grade of different parameters. The study addressed three main goals: (i) examining the reliability of the scoring system concerning the evaluated size of FPD; (ii) assessing histopathological parameters to analyse patterns, reflecting the categories of the scoring system; and (iii) finding threshold values to avoid the occurrence of ulcerations. The study found good observer reliabilities for the VC, but measuring the relative size of alterations resulted in divergent values according to the original specifications. With regard to the histopathological parameters, no clear patterns were found in the respective VC scoring levels. However, ulcerations revealed a significant effect on the size of the alteration, showing a greater grade of severity with increasing lesion size. Regarding the occurrence of ulcerations, optimum threshold values could be identified even in very small lesions. This study helps contribute to a better understanding of the pathophysiology of FPD. It also raises the question as to whether, in light of animal welfare concerns, threshold values of visual systems should be adjusted to avoid ulcerations, considering the outcome of our histopathological assessment.

Keywords: animal welfare, foot-pad dermatitis, FPD, histopathology, scoring systems, turkeys

Introduction

Foot-pad dermatitis (FPD) is one of the most important indicators for monitoring the welfare of poultry. The prevalence of FPD in turkeys (Meleagris gallopavo) throughout Europe is high. Krautwald-Junghans et al (2011) surveyed 66 flocks (11,860 animals in total) in Germany and found a prevalence of 34% in males and 60% in females in the 16th week of life. Allain et al (2009) detected severe foot-pad lesions, with a prevalence of 41% in French flocks. In Swedish populations, Berg (1998) found prevalences of 20 and 78% for severe and mild lesions, respectively. She also surveyed Swedish broiler farms and documented a prevalence of 5–10% for severe lesions and 10–35% for mild lesions (Berg 1998). While for broilers (Gallus gallus domesticus), FPD is an acknowledged welfare indicator (with 18 states requesting the recording of FPD by national law [Report from the Commission to the European Parliament and the Council 2018]), the evaluation of FPD in turkeys is voluntary. However, the apparent incidence of FPD in turkeys, means comparable regulations regarding turkeys can soon be expected to be adopted (Hocking et al 2017).

The absence of legal standards for turkey production throughout Europe (Allain et al 2013) means that each country has its own regulations for turkey husbandry, based mostly on recommendations and voluntary actions. In Germany, beyond the regulations of the German Animal Welfare Act (Status 2006, TierSchG) and the German Order on the Protection of Animals and the Keeping of Production Animals (Status 2006, TierSchNutzV), the ‘National Parameters for Voluntary Agreements for the Keeping of Turkeys’ (Status 2013, German designation: Bundeseinheitliche Eckwerte für eine freiwillige Vereinbarung zur Haltung von Mastputen) serves as a guideline for turkey husbandry (Bergmann et al 2013). In this guideline, the evaluation of foot-pad health is a major parameter to ensure adequate animal-keeping. Furthermore, quality assurance programmes require the evaluation of foot-pad health and the provision of feedback to both the farmer and the control organisations when slaughter capacity exceeds 500 animals per hour (QS; Qualität und Sicherheit GmbH, Germany 2019). Therefore, the scoring of FPD is established in most German slaugh-