The effect of floor heating and feed protein level on the incidence of footpad dermatitis in turkey poults

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Introduction

Footpad dermatitis, also known as plantar pododermatitis, is a condition characterized by lesions on the ventral foot-pads of poultry. It is a type of contact dermatitis. In an early stage, discolouration of the skin is seen. Hyperkeratosis and necrosis of the epidermis can be seen histologically. In severe cases, the erosions can be developed into ulcerations with inflammatory reactions of the subcutaneous tissue. The ulcerations are often covered by crusts formed by exudate, litter and faecal material. The lesions are commonly referred to as "ammonia burns", but nowadays the dermatitis is thought to be caused by a combination of wet litter and irritating factors from the birds' droppings. Although not primarily caused by any particular microbiological agent, the lesions often become infected by a variety of bacteria, especially *Staphylococcus spp*.

In severe cases, the footpad lesions most likely result in pain and walking difficulties, although rarely in obvious lameness. It has been demonstrated that birds with footpad dermatitis show poorer weight gain than unaffected birds. This might be a result of pain-induced reduced appetite, poorer feed conversion or a reluctance to move resulting in lower feed consumption. It has also been shown that flocks with a high incidence of footpad dermatitis often also display high incidences of hock burns and breast blisters, leading to downgradings and rejections.

Anything resulting in wet litter can be regarded as a risk factor for footpad dermatitis. Examples of factors that might increase the risk of wet litter are poorly designed drinkers, too high water pressure, too deep layers of litter, poorly absorbing litter material, intestinal diseases leading to wet droppings, poor feed composition resulting in wet droppings, overstocking, poor ventilation and difficult climatic conditions. Also, dietary deficiencies can be relevant, but should not be seen in commercial flocks. Excess nitrogen in the droppings is another risk factor, which has only partly been investigated in turkeys.

In temperate climate where fattening turkeys are reared in climate-controlled houses efforts are made to keep the litter dry to minimize the risk of footpad dermatitis. Nevertheless, footpad dermatitis is a considerable bird welfare and product quality problem for many producers. This study aimed at evaluating the effect of using floor heating to decrease the

prevalence of footpad dermatitis by improving litter quality, and also the effect of lower protein levels on the prevalence of footpad dermatitis, via the correlation with nitrogen levels in the droppings.

Materials and methods

The study was carried out on a commercial turkey farm, where the birds in two large compartments (one housing males and one females) where divided into three sections each. The sections were subjected to the following treatments: 1) Floor heating (FH+) or no floor heating (FH-) during 5 weeks; 2) Feed crude protein levels: 23.5% (*a*), 24.0% (*b*) and 25.0% (*c*) during 3 weeks. After that, all birds were given the same feed (27.5%). None of the birds were de-beaked, as this procedure is banned by the Swedish animal welfare legislation.

The prevalence of footpad dermatitis was recorded by examining 100 birds per section, classifying the feet as having no lesions, mild lesions or severe lesions. This was done once weekly for 8 weeks (slaughter age). The experiment was replicated once, this time shifting the sex of the birds between the compartments.

Results

There was a significantly lower prevalence of footpad dermatitis with floor heating at time of slaughter (8 weeks of age) (FH+ 21.5±3.7%, FH- 45.0±7.1%, $p<0.05$) (Figure 1). The incidence gradually increased during the last weeks of the rearing period. There was also a significantly ($p<0.05$) lower prevalence of footpad dermatitis with low (23.5%) or medium (24%) levels of crude protein, up to 3 weeks of age. At three weeks of age, the prevalence of severe FPD was 14.0%, 7.5% and 6.5% in the three feed groups respectively ($p<0.05$ for *c* versus *a* and *b*). This difference later decreased (Figure 2). However, the low and medium protein groups in the first replicate suffered an increased early mortality due to cannibalism, mainly directed at the wings. This aspect will have to be further investigated.

Conclusions

From these results we conclude that there is a positive effect of floor heating on the prevalence of footpad dermatitis, and that lower levels of crude protein in the feed during the first weeks of life has a positive but rather short effect on turkey foot health .

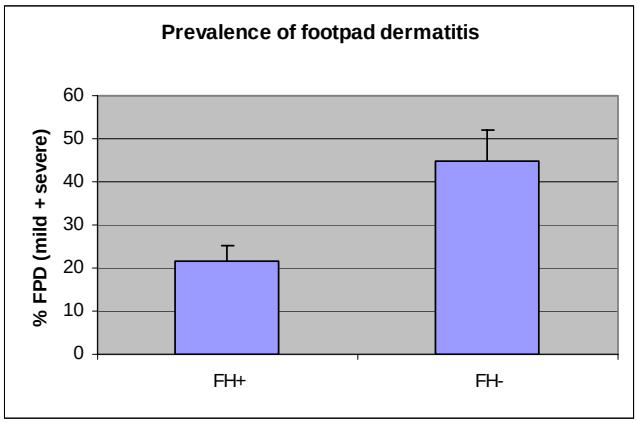

Figure 1. Point prevalence of footpad dermatitis in turkeys at 8 weeks of age, reared with (FH+) and without (FH-) floor heating.

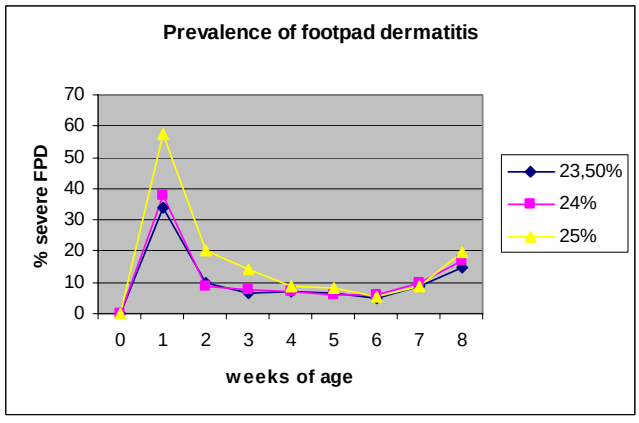

Figure 2. Prevalence of severe footpad dermatitis in turkeys from dayold to 8 weeks of age. The groups received different levels of feed crude protein (23.5%, 24% and 25% respectively) during their first 3 weeks, and later all groups were given the same feed.