

**STRAIN DIFFERENCES AND HERITABILITY ESTIMATES OF
FOOT PAD DERMATITIS AND HOCK BURN IN BROILERS
SUGGEST GENETIC SELECTION CAN IMPROVE WELFARE**

Joergen B. Kjaer^{1,2*}, Guosheng Su¹, Poul Sørensen¹, and Birte L. Nielsen³

¹**Dept. of Genetics and Biotechnology, Danish Institute of Agricultural Sciences,
Denmark.**

²**Inst. for Animal Welfare & Husbandry, Federal Agricultural Research Centre,
Germany**

³**Dept. of Animal Health, Welfare & Nutrition, Danish Inst. Agricultural Sciences,
Denmark.**

Foot pad dermatitis (FPD) is an important aspect of animal welfare that in severe cases can cause pain resulting in unsteady walk or hobbling gait. The open wounds can be gateway for bacteria that may spread hematogenously and can cause joint lesions and impaired product quality. Closely related to FPD are hock burn (HB). The skin of the hock becomes dark brown, and in severe cases scabs can be seen. The objectives of the present study were to study the development and severity of FDP and HB in relation to time and genotype as well as to estimate genetic parameters of these traits.

A total of 1920 birds from two strains were allocated to 12 groups. Feet and hocks were investigated at 6 (fast growing strain) or 10 wk (slow growing strain). Lesions were classified from 1 (no lesion) to 9 for FPD and from 1 (no lesion) to 3 for HB. Variance and covariance components were analyzed using a multivariate animal model, where FPD and HB were transformed into logarithmic scale. The analyses were carried out using REML.

FPD or HB were never found in chickens of the slow growing strain. In the fast growing strain the first FPD and HB were seen in week 2 and from then on they increased exponentially (FPD) or peaked in wk 5 (HB).

Heritability for FPD was estimated to 0.31 ($P < 0.01$), for HB to 0.08 (ns) and for body weight to 0.38 ($P < 0.01$). Genetic correlations among these traits were low and non-significant. Phenotypic correlations between HB and FPD respectively body weight were low (0.14 and 0.17, $P < 0.05$).

These estimates of heritability of FPD and HB, based on offspring of 35 sires, are the first to be reported in the literature. The relative high magnitude of the heritability of FPD and the low genetic correlation to body weight suggest that genetic selection for resistance to FPD should be possible without negative effects on body weight gain.

Keywords: Broiler welfare, foot pad dermatitis, hock burn, additive genetic variance