Genetic parameters of white striping in relation to body weight, carcass composition and meat quality traits in broiler chickens

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White striping (WS) is an emerging meat quality defect of increasing importance for the industry. The genetic determinism of this defect is still unknown so, the purpose of the present study was to shed some light on the heritability (h2) of WS and its genetic correlations (rg) with other traits of interest. The analyzed database contained 10451 records measured on two lines of broilers selected divergently on the ultimate pH (pHu) of breast muscle (pHu+, pHu-) for 6 generations. WS scores were recorded only on the last two generations (n=1348) as 0 (NORM), 1 (MOD) and 2 (SEV). The incidence in the measured population was 36.7% of MOD and 14% of SEV totaling to 50.7% and it was higher in the pHu+ line than in the pHu- line (65.8 vs. 35.15% respectively, $P < 0.0001$). A strong genetic determinism for WS ($h2 = 0.65 \pm 0.08$) was evidenced. WS was significantly correlated with body weight ($rg = 0.33 \pm 0.15$), breast meat yield (0.68 ± 0.06), but not with the percentage of thigh + drumstick or abdominal fat. In both lines, increased body weight, muscle mass and yield were significantly associated with increased severity of WS. Significant rg were observed between WS and breast (0.21 ± 0.08) and thigh (0.32 ± 0.11) pHu and cooking loss (0.30 ± 0.15) but not with drip loss and curing cooking yield. Globally, severely affected breast fillets exhibited a paler color and higher drip and cooking losses. In conclusion, genetics seems to be a major determinant of WS. This condition appears to be more affected by the rate of muscular development and meat yield than by body weight. In addition, its impact on meat quality is limited but not negligible.

Keywords: Genetic parameters, white striping, broiler