

INFLUENCE OF THE NAKED NECK GENE ON HEAT TOLERANCE OF SLOW GROWING BROILERS ON GROWTH, BODY COMPOSITION AND MEAT QUALITY

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Influence of the Naked Neck gene, *Na*, on heat tolerance has been evaluated in slow growing meat-type male chickens, representative of "label rouge" production, in which the *Na* gene was segregating. In addition, standard male Ross broilers were used as rapid growth controls. Chickens were reared either in "hot" or "normal" conditions, from 3 weeks of age to slaughter. Fluctuating temperature was used to simulate day-night variations, i.e. 17°C to 23°C in normal conditions and 27°C to 33°C in hot conditions. As the aim was to study the effect of heat on a final product of 2 kg, animals were slaughtered when they reached this weight, i.e. at different ages. Chickens were weighed twice a week, and Gompertz function was fitted to our data. These growth curve parameters were used to calculate the theoretical age at 2 kg. After slaughter, chickens were dissected and carcass, abdominal fat, breast and leg yields were measured (CY, AFY, BRY, and LY). Meat quality was evaluated 24 h post-mortem with pH and colour (L, a*, b*) of the breast, and 72 h post-mortem with breast meat drip loss (DL). Rectal temperature was measured at the maximum and minimum ambient temperature (Δ BTS).

Significant genotype by environment interactions was found only for CY, LY, yellowness and pH of breast meat, and Δ BTS. CY increased in hot conditions for broilers only, but decreased in *Na/Na* birds, and did not change in *Na/na* and *na/na* birds. Heat affected LY only in label chickens (+2.3% vs. +0.5% in broilers) and pHu only in broilers (+0.17 vs. +0.04 in label). Yellowness of meat was less in label than in broilers, only in normal conditions. Finally, body temperature variation was not different under normal or hot conditions in *Na/Na* birds, whereas it increased for other genotypes under hot conditions (+0.5 for label and +0.8 for broilers).

Temperature effect was significant for all traits except for BRY and breast meat colour. Theoretical age at 2 kg was reached earlier in normal than in hot conditions (60.5 d vs. 63.7 d). AFY, and LY were higher under hot conditions (2.84% vs. 2.50% for AFY, 32.3% vs. 30.4% for LY), but BRY was unaffected by temperature. Breast meat was slightly less acid (+0.07 for pH) and had higher drip loss (-1.21 vs. -0.90) under hot conditions, but breast meat colour did not change with temperature. Δ BTS was greater under hot conditions than normal conditions (0.42°C vs. 0.90°C).

Homozygous and heterozygous naked neck birds tended to reach the weight of 2 kg 3.3 d sooner than normally feathered birds. The difference between broiler and label chickens was 29.8 d. Furthermore, CY of *Na* birds was higher than for normally feathered birds (81.6 % vs. 80.0 %) within the slow-growing line. Broilers were less fat than label chickens (2.4% vs. 2.8%). Broilers showed higher BRY and lower LY than label chickens (19.0% vs. 16.9-17.5% and 29.6% vs. 32.0%). Broilers had a paler, less red and yellower breast meat than label chickens (49.2 vs. 46.3 for L, 0.16 vs. 0.54 for a*, and 12.6 vs. 11.3 for b*), but *Na* genotype did not affect meat colour. Breast pH and drip loss were different between broilers and label chickens, but not within genotypes of label (pH= 5.80 and 5.67, drip loss= -1.5 and

0.92 for broilers and label chickens, respectively). The same remark holds for body temperature variation (1.02 for broilers vs. 0.54 for label chickens).

Keywords: heat, label chicken, growth, meat quality, naked neck gene