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BROILER PERFORMANCE AND MEAT QUALITY OF TWO ITALIAN LOCAL BREEDS IN ALTERNATIVE TO ROSS 308 STRAIN REARED UNDER DIFFERENT CLIMATIC CONDITIONS

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ABSTRACT: The genetic selection for growth rate in poultry production has determined the loss of biodiversity, while high performance strains (HPS) show health problems, metabolic disorders, muscle abnormalities, besides poor adaptability under unfavourable ambient conditions. Thus, the present study aimed at evaluating growth performance and meat quality of two local breeds (LB), *Bionda piemontese* (BP) and *Robusta maculata* (RM), and one HPS (*Ross 308*), reared under thermoneutral conditions (22.4±2.1°C) or submitted to high temperature (27.8±1.8°C) until slaughtering (98 d for LB, 42 d for HPS). A total of 90 BP, 68 RM and 96 *Ross 308* chicks of both sexes were housed in 24 pens (8-12 birds per pen) according to a tri-factorial arrangement (3 genotypes × 2 temperatures × 2 sexes). The HPS chickens reached the highest final live weight, BP had the lowest, whereas RM achieved an intermediate weight (2852 vs 1771 vs 2216 g, respectively; P<0.001). The same figure was recorded for daily weight gain, feed intake and feed conversion ratio in the trial period (P<0.001). High temperature conditions reduced final live weight of the animals (-18.8% on average) with a greater effect on HPS compared to LB (-25.1% and -14.3%, respectively), i.e. significant interaction temperature × genotype (P<0.001). In all genotypes, male chickens showed higher final live weight, daily weight gain and feed intake, and a better feed conversion compared to females (P<0.001). The HPS chickens showed higher carcass weight (2133 vs 1391 g), carcass yield (74.7% vs 68.6%) and breast yield (41.1% vs 26.4%), and lower wings and hind leg yield than LB. At 24 h after slaughter, HPS exhibited higher *P. major* pH (5.97 vs 5.85), lightness index (52.5 vs 46.5) and cooking losses (41.9% vs 33.0%) than LB (P<0.01), whereas muscle shear force was not affected by genotype. No myopathy was found in LB. Contrariwise, 85% of HPS animals were affected by myopathies, i.e., white striping, wooden breast, or spaghetti meat. White striping and spaghetti meat were more frequent in HPS animals reared under thermoneutrality than high temperature conditions (78.4% vs. 53.8% and 43.1% vs. 21.1%, respectively; P<0.01). In conclusions, HPS chickens had better performance compared to LB animals but a lower capability to cope with the temperature challenge. HPS also showed breast myopathies, especially under thermoneutral conditions. Differently, breast myopathies were absent in LB.

Keywords: High temperature, breast myopathies, rearing conditions, strains

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