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Effect and interactions of dietary sodium and chloride on broiler starter performance (hatching to twenty-eight days of age) under subtropical summer conditions FREE

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Abstract

One-day-old Starbro male broiler chicks (n = 360) were used to determine the effect of increasing levels of Na⁺ and Cl⁻ above the NRC (1994) recommendations for growing broilers diets (hatching to 28 d) in extremely hot weather. The average maximum and minimum temperatures recorded were 39 and 32 degrees C, respectively. An average relative humidity was 58.2% during the experimental period. Three levels of dietary Na⁺ (0.20, 0.25, and 0.30%) and Cl⁻ (0.30, 0.40, and 0.50%) were used in 3 x 3 factorial arrangement while maintaining a dietary electrolyte balance (DEB) of 250 mEq/kg. Higher weight gain (P < 0.002) and maximum water consumption (P < 0.05) were observed for birds fed diets containing 0.25 and 0.30% Na⁺, respectively. Litter moisture was significantly higher (P < 0.05) for birds fed diets containing 0.25% Na⁺ and 0.40 and 0.50% Cl⁻. High dietary Na⁺ (0.30%) tended to increase breast yield (P < 0.003) and decreased abdominal fat (P < 0.001). There was no effect of Na⁺ on blood pH or serum HCO₃⁻. Diets containing 0.40% Cl⁻ increased the dressing percentage (P < 0.001) and leg yield (P < 0.001) and decreased serum HCO₃⁻ (P < 0.001). There was no effect of dietary Cl⁻ on blood pH, feed intake, weight gain, feed:gain, water intake, water:feed intake, or mortality. Significant dietary effect of Na⁺ x Cl⁻ was noted only for litter moisture (P < 0.001), dressing percentage (P < 0.05), breast (P < 0.05) and leg (P < 0.001) yields, abdominal fat (P < 0.002), and serum HCO₃⁻ (P < 0.001). Birds fed diet containing 0.25% Na⁺ and 0.30% Cl⁻ performed as well as those fed other diets when the cyclic temperature ranged from 32 to 39 degrees C.

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