

Zinc amino acid complexes improve performance of broilers in heat stress conditions

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Abstract

Heat stress (HS) is a common problem in (sub)tropical and temperate countries during summer months. Higher metabolic body heat generation and increased susceptibility to HS is the result of intensive selection for increased production. HS impairs animal welfare, performance and meat quality, which results in large economic losses in the poultry industry. Nutritional interventions through supplementation of minerals or vitamins (e.g. zinc or vitamin E (VE)), might alleviate the negative impact of HS. This study aimed to compare the effect of supplying Zn either from ZnSO₄ or from zinc-amino-acid complexes (ZnAA) in a chronic cyclic HS model (32°C±2°C, 55-65% RH, 6h daily) which was applied from d28-36. A 2x2 factorial design was used with 9 replicates of 34 male broilers (ROSS 308) per treatment. Birds were fed a wheat-rye based diet supplemented with 60 ppm zinc either as ZnAA or as ZnSO₄ combined with a normal (50IU/kg) or high level (100IU/kg) of VE from d1-36. Performance and meat quality were assessed. Broilers supplemented with ZnAA and a normal level of VE showed a significantly increased body weight (p=0.02) and showed a trend for increased growth (p=0.06) at slaughter age and a lowered FCR (p=0.09) during HS (d28-36) compared to the three other groups. Breast meat yield was increased (p=0.02) in broilers supplemented with ZnAA. Meat derived from birds that were fed a diet supplemented with ZnAA was characterized by decreased drip loss (p=0.03) and thawing loss (p=0.03), indicating improved meat quality. This study shows that providing Zn as ZnAA instead of ZnSO₄ improved performance and meat quality parameters when subjected to chronic cyclic HS for the last 9 days of the grow-out period, while supplementing higher levels of VE didn't show a positive impact.

Keywords: Heat stress, broilers, zinc supplementation, performance, meat quality