-Effects of dietary electrolyte balance and addition of electrolyte-betaine supplements in feed or water on performance, acid base balance and water retention in heat stressed broilers

Sayed, M.A.M., and J. Downing

Abstract:

The effects of dietary electrolyte balance (DEB) and electrolyte-betaine (El-Be) supplements on heat-stressed broiler performance, acid-base balance and water retention were evaluated during the period 31-40d of age in a 2x3 factorial arrangement of treatments. A total of 240 broilers were assigned to 6 treatment groups each with 8 replicates of 5 birds per cage and were exposed to cyclic high temperature (32-24 +/- 1 degrees C). Birds were provided with diets having DEB of either 180 or 220mEq/kg. El-Be supplements were either added to the diet, water or not added to either of them to complete the array of 6 treatment groups. An additional 80 birds were kept at thermoneutral temperature (20 +/- 1 degrees C) and were provided with tap water and diets with DEB of either 180 or 220mEq/kg to serve as negative controls. Exposure to high temperature depressed growth performance, increased rectal temperature and decreased potassium (K+) retention. In high-temperature room, birds fed on diets with DEB of 220mEq/kg tended to increase BW from 35-40d of age. However, at thermoneutral temperature, broilers fed on diets with DEB of 220mEq/kg increased K+ retention. Adding El-Be supplements in feed or water improved feed conversion ratio (FCR), enhanced water consumption and increased K+ and sodium (Na+) retention. Interactions between DEB and El-Be supplements tended to affect body weight gain and FCR during the periods 35-40 and 31-40d of age, respectively. It is suggested that when using a diet with DEB of 180mEq/kg, adding the El-Be supplements in drinking water was more beneficial than in feed. Adding the supplements in feed or water was equally useful when using DEB of 220mEq/kg.

Keywords:

HIGH AMBIENT-TEMPERATURES; ENVIRONMENTAL-TEMPERATURE; SODIUM-BICARBONATE; PLASMA ELECTROLYTES; GALLUS-DOMESTICUS; MINERAL BALANCE; DRINKING-WATER; CHICKENS; BLOOD; EXPOSURE

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