**Individual non-essential amino acids fortification of a low-protein diet for broilers under the hot and humid tropical climate**


ABSTRACT

A study was conducted to investigate the effects of feeding low-protein diets fortified with individual non-essential amino acids (NEAA) on growth performance, serum metabolites (uric acid, UA; triglycerides, TG; total protein, TP; and albumin, Alb), organ weight, breast yield, and abdominal fat weight in broiler chicks raised under the hot and humid tropical climate. Eight isocaloric (3,017 kcal/kg) experimental diets were formulated and fed to male broiler chicks from d 1ï 21 as follows: 1) 22.2% crude protein (CP) (positive control; PC); 2) 16.2% CP + mixture essential amino acids (EAA) to meet or exceed the National Research Council (1994) recommendations (negative control; NC); 3) NC + glycine (Gly) to equal the total glycine + serine level in the PC; diets 4 through 7 were obtained by supplementing NC diet with individual glutamic acid, proline, alanine, or aspartic acid (Glu, Pro, Ala, or Asp, respectively); 8) NC + NEAA (Gly + Glu + Pro + Ala + Asp) to equal the total level of these NEAA in the PC. Fortifying NC diet with mixture NEAA resulted in a similar growth performance as PC. However, fortification of low-CP diet with individual NEAA failed to improve body weight (BW) ($P < 0.0001$), feed intake (FI) ($P = 0.0001$), and feed conversion ratio (FCR) ($P = 0.0001$). Serum uric acid (UA) was lower ($P = 0.0356$) in NC birds and NC diet supplemented with individual NEAA birds, whereas serum triglyceride (TG) ($P = 0.007$) and relative weight of abdominal fat ($P = 0.001$) were higher in these birds. In conclusion, no single NEAA fortification may compensate the depressed growth performance attributed to a low-CP diet. However, fortification with Gly may improve FCR. There is a possibility that broilers raised under the hot and humid climate require higher Gly fortification than the level used in this study.



**Keyword:** Low protein diet; Nonessential amino acids fortification; Broiler chickens; Heat stress