CERTIFICATE OF ATTENDANCE

This is to certify that

ABOLGHASEM GOLIAN

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Influence of broiler breeder age on transfer of amino acids to the progeny

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We aimed to quantify the transfer of amino acids to the progeny at different stages of broiler breeder life. A commercial nucleus composed by six sheds of Hubbard breeders was evaluated at 32, 42 and 52 weeks of age. At each age, four feed samples per shed were collected and 60 eggs were selected from a total of 460 eggs to obtain the yolk, as the rest were sent to incubation. After hatching, 30 newly hatched chicks were euthanized to obtain the yolk sac samples which, as the egg yolk samples, were lyophilized and sent to the laboratory, with feed samples, for amino acid quantification. Data were submitted to ANOVA by SAS statistical software, and Tukey test were applied at 5% of probability to compare the means. Breeder age influenced ($P<0.05$) the percentages of threonine, tryptophan, leucine, phenylalanine, glycine, serine, proline, alanine and glutamic acid. All these amino acids but tryptophan were highest found in the feed directed to the birds at 32 weeks of age, a result that was already expected since the birds feed undergoes nutritional adjustment according to the phase of the production cycle. Egg yolks at 42 weeks of age had lowest ($P<0.05$) percentages of methionine, cystine, methionine + cystine, threonine, tryptophan, arginine, isoleucine, valine, phenylalanine, glycine, serine, alanine, aspartic acid and glutamic acid, with lysine being the only amino acid to be found in the highest amount at this age when compared to 32 and 52 weeks old ($P<0.05$). Chicks from younger breeders showed in their yolk sac greater amounts of all of the evaluated amino acids ($P<0.05$). In general, regarding the analyzed nutrients, younger breeders showed more efficiency in transferring them to the egg. After hatching, the progeny from younger breeders were also more efficient in the absorption of these amino acids, considering the similarity of these nutrients quantities found in the different evaluated feed.

Guanidinoacetic acid supplementation improves feed conversion in broilers subjected to heat stress

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Guanidinoacetic acid (GAA) is synthesized from Gly and Arg and the immediate precursor of creatine. The creatine (Cr) and creatine phosphate (PCr) system plays a critical role in energy metabolism. It is hypothesized that dietary supplementation with GAA will be beneficial to heat stressed finishing broilers. A total of 720 one-day-old male Ross 308 broilers were allocated to 3 dietary treatments with 12 replicates (20 birds each). Treatments were either 0, 0.6 or 1.2 g/kg GAA added to a corn/SBM diet and fed for 39 d. A chronic cyclic heat stress model (34 °C/50-60% rh for 7 h daily) was applied in the finisher phase (d25-39). One bird per pen was sampled on d26 (acute heat stress) and d39 (chronic heat stress) to determine levels of GAA, Cr and Arg in blood, and Cr, PCr and ATP in muscle. GAA at 1.2 g/kg decreased F:G compared to control in the grower phase (d10-25) (1.32 vs 1.35; $P<0.05$). In the heat stressed finisher period, 0.6 and 1.2 g/kg GAA reduced feed intake by 1.1 and 3.3% respectively and improved F:G (1.76, 1.66 and 1.67 for control, 0.6 and 1.2 g/kg GAA respectively, $P<0.05$). Examination of breast meat samples revealed at both sampling days significant ($P<0.05$) increases of PCr, Cr, and PCr:ATP ratio with increasing dietary GAA. GAA and Cr in blood were increased with increasing dietary GAA ($P<0.05$) at d26 and d39. Blood Arg increased with increasing dietary GAA (+18.2 and +19.9% for 0.6 g/kg GAA on d26 and d39, respectively, and +30.8 and +33.6% for 1.2 g/kg GAA, $P<0.05$) suggesting enhanced availability of Arg for other metabolic purposes than de-novo GAA formation.