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البحث الرابع

عنوان البحث باللغة الانجليزية : Effects of In Ovo Methionine-Cysteine injection on embryonic development, antioxidant status, IGF-I and TLR4 gene expression, and jejunum histomorphometry in newly hatched broiler chicks exposed to heat stress during incubation.

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ABSTRACT

Sulfur amino acids are typically the first-limiting amino acids (AA) used in protein metabolism in poultry. Therefore, we hypothesized that their utilization in the pre-hatch period would affect embryonic development, IGF-I and TLR4 gene expression, antioxidant status, serum biochemical profile, and jejunum histomorphometry of newly hatched Ross broiler chicks incubated under heat stress conditions. A total of 150 fertile broiler eggs were subjected to heat stress (39.6 C for 6 h/d) from d10 until d18 and injected at d 17.5 of incubation with methionine and cysteine (Met-Cys) at a dose of 5.90 mg L-methionine plus 3.40 mg L-cysteine. The effects of Met-Cys administration were examined and compared with the control (Non-injected group) and 0.75% NaCl injected group. The results showed that no significant differences among all groups in serum protein profiles (total protein, albumin, globulin, and albumin/globulin ratio) and creatine kinase were observed. The level of heat shock protein-90 was decreased with Met-Cys *In ovo* injection. *The In ovo* injection of Met-Cys also improved the values of total antioxidants capacity and glutathione in examined tissues. At the same time, an increase in fold change mRNA abundance of IGF-I and TLR4 was observed after Met-Cys injection in tested tissues. Finally, an increase of 29% in villus area was found after Met-Cys injection compared to the control group. In conclusion, the *In ovo* injection of Met-Cys resulted in improved embryonic development, IGF-I and TLR4 gene expression, antioxidant status and jejunum histomorphometry of newly hatched broiler chicks exposed to heat stress during incubation.