



### البحث الثالث

عنوان البحث باللغة الانجليزية :

**Elnesr, S. S.,** Elwan, H. A. M., Xu, Q. Q., Xie, C., Dong, X. Y., & Zou, X. T. (2019). Effects of in ovo injection of sulfur-containing amino acids on heat shock protein 70, corticosterone hormone, antioxidant indices, and lipid profile of newly hatched broiler chicks exposed to heat stress during incubation

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### ABSTRACT

This study hypothesizes that in ovo sulfur amino acids (SAA) injection can alleviate the heat or oxidative stress of hatched chicks. Thus, the study aimed to assess the impact of in ovo injection of SAA with heat stress during the incubation on heat shock protein 70 (HSP70), corticosterone hormone, antioxidant indices, and lipid profile of newly hatched broiler chicks. Eggs were incubated under optimal incubation temperature (37.8°C) from days 1 to 10 then under high temperature (39.6°C for 6 h daily) between 10 and 18 D of the incubation. At day 17.5 of incubation, 150 eggs were randomly divided into 3 groups of 50 replicate eggs. The first group served as control (non-injected group, NIG), the second group was only injected with saline solution (saline-injected group, SIG), and the third group was injected with a mixture of 5.90 mg L-methionine plus 3.40 mg L-cysteine (sulfur amino acids-injected group, SAAIG). The results exhibited that serum HSP70 and corticosterone concentrations were significantly reduced ( $P < 0.001$ ) in the SAAIG compared with the NIG and SIG. In ovo SAA injection significantly augmented the antioxidant indices in the serum and tissues compared with the NIG and SIG. HSP70 mRNA relative expression was decreased but glutathione peroxidase (GSH-Px) mRNA relative expression was augmented in the tested tissues ( $P < 0.001$ ) in the SAAIG compared with the NIG. The SAAIG had significantly ( $P < 0.05$ ) lower levels in serum lipid profile compared to those of the control and SIG. In conclusion, in ovo SAA injection (methionine plus cysteine) in the embryonated eggs exposed to heat stress increased GSH-Px gene expression and antioxidant indices, and reduced HSP70 gene expression, corticosterone concentrations, and lipid profile of newly hatched broiler chicks.