

**The potential of *in ovo* fed amino acids to reduce the effect of heat stress on the performance of broiler chickens**

Resume :

This study examined the potential of *in ovo* fed amino acids (AA) in improving thermotolerance in broilers under heat stress conditions. A total of 1680 fertile Ross 308 eggs were sourced from a commercial broiler breeder flock and injected with one of six treatments (280 eggs/treatment) as follows: CTRL (sterile diluent), B (1.0 mg leucine), C (0.45 mg leucine + 1.15 mg methionine), D (3 mg methionine + 2 mg cysteine), and F (0.4 mg leucine + 1.6 mg methionine + 1.6 mg cysteine). The treatments were administered on embryonic day 18 at a volume of 52.5  $\mu$ L per egg. Upon hatching, chicks were wing-sexed, vaccinated, and transported to the CRSAD facility. The chicks were assigned to a randomized complete block design with 6 blocks and 10 replicates per treatment and were reared under optimal conditions for 28 days. On day 29, birds were separated into two different rooms (5 replicates/treatment): a control room (23°C, 45% humidity) and a stress room (34°C, 55% humidity). Heat stress was applied for 10 hours/day from day 29 to day 35. Throughout this study, all chickens were provided *ad libitum* access to standard feed. Between days 1 and 28, measured parameters included body weight (BW), feed efficiency (FCR), and mortality. During the stress phase, body temperature was also recorded twice a day using thermal imaging. Additionally, samples of blood, muscle, and liver were collected at day 35 to assess lipid peroxidation. Preliminary analysis revealed a significant effect of treatments F and D on multiple parameters. Both treatments were associated with increased BW on days 10 and 21 ( $P < 0.05$ ) and were associated with mortality rates lower than 1.0% up to day 28. Heat stress application was associated with reduced BW ( $P < 0.05$ ), increased FCR ( $P < 0.05$ ) and elevated mortality ( $P < 0.001$ ). However, the effects of treatments on BW, FCR, and mortality during the stress phase were not statistically significant. Notably, treatment F exhibited the lowest numerical mortality rate, accounting for only 50% of the CTRL group. Furthermore, both treatments consistently displayed lower-than-average facial temperatures during heat stress, with statistically significant differences observed on days 4 and 6 of stress ( $P_{\text{TRT} \times \text{Day}} < 0.05$ ). These findings suggest that combinations of these AAs may be leveraged to combat the deleterious effects of heat stress on broiler chickens.