



High Eggshell Temperatures During Incubation Decrease Growth Performance and Increase the Incidence of Ascites in Broiler Chickens

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Abstract

High eggshell temperatures (EST; $\geq 38.9^{\circ}\text{C}$) during the second half of incubation are known to decrease the body and organ development of broiler hatchlings. In particular, relative heart weights are decreased by a high EST, and this may increase the incidence of metabolic disorders that are associated with cardiovascular development, such as ascites. The current study investigated the effects of a high EST on chick quality, subsequent performance, and the incidence of ascites later in life. Eggs were incubated at a normal (37.8°C) or high (38.9°C) EST from d 7 of incubation onward. After hatching, the chickens were housed per EST in pens, and a normal or cold temperature schedule was applied during the grow-out period. Hatchability, hatchling quality, BW, feed conversion ratio, total mortality, mortality associated with ascites, slaughter characteristics, and ascites susceptibility at 6 wk of age were evaluated. Except for total ventricle weight, no interaction was found between EST and the grow-out temperature. Hatchability was comparable between the EST treatments, but the percentage of second-grade chickens was 0.7% higher at the high EST. Yolk-free body mass was 3.0 g lower, and heart weights were 26% lower at hatch in the high compared with the normal EST treatment. Body weight continued to be less during the grow-out period after the high EST incubation. However, breast meat yield was 1.0% higher in the high than in the normal EST. Feed conversion ratio did not differ between EST treatments.

Total mortality was 4.1% higher and mortality associated with ascites was 3.8% higher in the high compared with the normal EST treatment. The ratio between the right and total ventricle was 1.1% higher in the high compared with the normal EST treatment at slaughter age. In conclusion, a high EST from d 7 of incubation onward decreased hatchling quality and growth performance, but increased breast meat yield. Furthermore, high EST incubation increased the incidence of ascites, which may be related to the reduced heart development at hatch.

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