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Effect of Quinoa Seed Powder and Alcoholic Extract on Productive Performance and Some Biological and Physiological Blood Parameters of Broilers Exposed to Heat Stress

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Abstract

This paper evaluated the effect of quinoa (Chenopodium quinoa Willd.) seeds powder and alcoholic extract on broiler chicks subjected to chronic heat stress (33 o C; 35 days). On the eight treatments (3 replicates, 10 birds each), quinoa was either fed as seed powder (2, 4, 6 g /kg in drinking water) or alcoholic extract (0.5, 1.0, 2.0 g/L). The performance (BWG, FI, FCR) was measured at starter, grower, and grand-stage; serum protein and lipid profile, antioxidants status (GPX, CAT, GSH, MDA) were measured at 35 d. Supplementation- especially that of quinoa extract 1.0 g/L- enhanced the BWG and FCR, total protein and albumin, antioxidant enzyme activities, and decreased MDA and LDL when compared to control (P≤0.05). Mechanistically, the presence of phenolics, flavonoids, and saponins in quinoa would increase the redox balance and metabolic efficiency during heat load and, therefore, increase the feed intake and physiological stability. Quinoa extract at 1.0 g/L appears to be a practical nutritional strategy for broilers in hot climates. Materials and methods: The effect of quinoa seed powder and extract on the performance and production of Ross 308 broiler chickens under heat stress conditions was evaluated. The study included 210 birds divided into eight treatment groups with different doses of quinoa in water. The testing occurred from June 28 to August 26, 2024, at a temperature of 33°C. Quinoa powder was prepared by grinding the seeds, and the extract was obtained by soaking the seeds in cold water and concentrating it. Data on growth, feed efficiency, mortality rate, and blood samples for biochemical marker analysis were collected at 35 days of age. Results: Broilers receiving 1 g/L quinoa extract (T6) showed the greatest BWG (945, 1308, and 2253 g in starter, grower, and overall), lowest FI (3159 g), and best FCR (1.36, 1.43, 1.40). T6 also exhibited higher TP (5.39 g/dL), AL (2.72 g/dL), HDL and antioxidant enzyme activities, and reduced MDA, TC and LDL compared to control (P≤0.05).

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