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Betaine and ascorbic acid modulate indoor behavior and some performance indicators of broiler chickens in response to hot-dry season

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Abstract

Heat stress causes lipid peroxidation in poultry, necessitating antioxidant administration. The experiment evaluated the modulating effects of betaine and ascorbic acid (AA) on indoor behavior and some performance parameters of broiler chickens during the hot-dry season. Experimental groups were: Group I (control) was daily given sterile water; Group II, betaine at 250 mg/kg; Group III, AA (50 mg/kg), and Group IV, betaine (250 mg/kg) + AA (50 mg/kg), orally for 42 days. The natural occurring dry-bulb temperature (28.0 – 37.0 °C), relative humidity (69.0 – 93.0%), and temperature-humidity index (27.9 – 36.1 °C) were predominantly outside the thermo-neutral zone for broiler chickens, indicating heat stress conditions. Scan test, used to assess the percentage of birds sitting/lying, panting, feeding, drinking and spreading wings, was performed at 06:00 h, 13:00 h and 18:00 h on each of days 35 and 42. Feed intakes (FD), water consumption (WC), body weight, average daily weight gain (ADG) and feed-to-gain ratio (FGR) were obtained. Betaine+AA reduced ($P < 0.05$) percentage of birds panting; AA decreased ($P < 0.05$) percentage of birds spreading wing, compared with control. Finisher phase: betaine and/or AA, decreased FGR, increased ADG ($P < 0.05$); betaine reduced ($P < 0.01$) FD compared with control. Grower phase: betaine, either alone or with AA, lowered FGR and FD ($P < 0.01$); AA reduced ($P < 0.01$) FD, compared with control. Starter phase: betaine and/or AA decreased WC ($P < 0.05$); AA lowered FGR, compared with controls. Betaine administration decreased ($P < 0.05$) FD at 4 week-old, but its administration, either alone or with AA, reduced WC at 1 week-old, compared with control. Overall, betaine and/or AA group lowered FGR compared with controls. In conclusion, administration of betaine and/or AA to broiler chickens modulated indoor behavior, some performance indicators and water consumption during the hot-dry season.

Key Words:

betaine, heat stress, indoor behavior, performance

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