

Effect of Black Cumin Seeds on Growth Performance and Nitrogen Excretion in Broiler Chickens

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Abstract—The use of antibiotics (AB) in poultry diets has been a concern for development of antibiotic resistant pathogenic microbes, and this resulted in an intensified search for alternative natural growth promoters to maintain growth and laying performance of chickens. Aromatic plants and essential oils extracted from these plants have become more important because of their antimicrobial actions and stimulating effects on the digestive systems and immunity of animals. The objective of this study was to investigate the effect of black cumin seeds (BCS) on growth performance, nutrient utilization, immunity and gut health and nitrogen excretion in broiler chickens. Three hundred sixty one-day-old broiler chicks were randomly divided into five experimental groups comprising of eight replicates each. Each replicate contained nine birds. All diets were formulated to meet or exceed nutritional requirements of broiler chickens in different growth phases. Ground BCS were added to the basal diet at 5, 10 and 20 g/kg for preparation of 3 BCS treated groups - LBC, MBC and HBC, respectively. No additive was added to the basal diet for the control group whereas 0.5 g AB/kg diet was added to the basal diet for the AB group. Metabolizability of nutrients was determined after 42 day. Growth performance of the chickens tended to increase ($P = 0.10$) with increasing BCS dose, and tended to be greater ($P = 0.07$) for the BCS groups compared with the AB group. Average daily feed intake (ADFI) was greater ($P < 0.001$) for the BCS groups than the control, which increased quadratically ($P < 0.001$) and the greatest ADFI was noted for the MBC dose. Supplementation of BCS and AB did not affect feed conversion ratio (FCR) expect the decreasing

tendency of FCR was noted for the BCS groups compared with the control, when overall FCR was calculated. Total N excretions as well as N excretion per unit of final BW or edible meat were lower for BCS versus CON ($P = 0.005$ to $P < 0.001$), AB versus CON ($P < 0.001$) and AB versus BCS ($P < 0.001$) and decreased linearly ($P = 0.009$ to $P < 0.001$) with increasing doses of BCS. The results suggested that the supplementation of BCS at 10 to 20 g/kg diet may improve growth performance and nutrient utilization in broiler chickens.