MODULATION OF GUT MICROBIOTA AND ENHANCEMENT OF BROILER PERFORMANCE WITH PROTECTED ORGANIC ACIDS AND ESSENTIAL OILS

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Concerns on antibiotic resistance and increasing demand for naturally produced chickens have led to the development of alternative products in lieu of antibiotics. This study was conducted to determine the effects of protected organic acids (OAs) and essential oils (EOs) on performance and gut microbiota of broiler chickens. A total of 612 Ross 308 day old chicks were assigned to receive 1 of 3 treatments for 28 days: 1) basal diet with no antibiotic (T1), 2) T1 + 300 ppm of protected OAs and EOs (T2), and 3) T1 + 1500 ppm of protected OAs and EOs (T3). A completely randomized design with 3 treatments and 12 replicates with 17 birds was used. The bodyweight (BW) of birds in T2 and T3 at d 21 was increased relative to T1 (P<0.02,), as was the BW of birds in T2 at d 28 (P<0.05). Though not significant, a trend towards improved feed conversion ratio (FCR) at d 21 in T2 (P<0.09) and T3 (P<0.06), as well as at d 28 in T2 (P<0.06) was observed. Sequencing data at d 14 and 28 revealed retained complexity and overall structure of the ileal and cecal microbiota across treatments. However, compared to T1, significant changes in abundance of *Lactobacillus* within the cecum of birds in T2 and T3 were found at d 28. Overall, the supplementation of protected OAs and EOs had no adverse effect on microbial diversity of the intestine and appears to offer benefits on gut health and productivity of broiler chickens.