

M36 Effects of Eimeria challenge and feed outage on growth performance and gut health of broilers

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Coccidiosis and feed outage have been reported to be as common predispose factors for chronic necrotic enteritis. A floor pen study was conducted with 828 day-old male broilers to evaluate the effect of Eimeria challenge and feed outage on growth performance and gut health. The study consisted of 4 treatments – T1: Negative control with coccistat (NC), T2: NC+ feed outage, T3: Eimeria challenge, T4: Eimeria challenge+feed outage, each with 9 replicate pens of 23 birds each. T2 and T4 birds were subjected to 24-hr feed outage twice a week starting on d18. T3 and T4 birds were orally gavaged with a coccidiosis vaccine at 5X the recommended vaccination dose on d 14. A common nutritionally complete typical US corn soybean meal based broiler diets were formulated for starter (0-14 d), grower (14-29 d), and finisher (29-42 d) phases and fed for all birds. All diets were pelleted, and starter diet was crumbled after pelleting. Data were subject to one way ANOVA; means were separated by Fisher's protected LSD test. A P-Value ≤ 0.05 was considered statistically different. Both Eimeria challenge and feed outage reduced BW on d21, 28 and 41, gain on d21 and d28, and increased FCR on d21 and 28. The growth performance of birds challenged with Eimeria and/or feed outage started to catch up during finisher phase. Eimeria challenge alone increased Eimeria acervulina lesions and serum lactose; reduced skin yellow color, jejunal FABP2, FABP6 and MUC2 gene expression at 1 week post challenge (d21). Feed outage after 1 week (d21) increased serum endotoxin regardless of Eimeria challenge and feed outage after 4 weeks (d41) reduced skin yellow color and duodenal FABP6 in the absence of Eimeria challenge. Combination of Eimeria challenge and feed outage increased serum $\alpha 1$ acid glycoprotein (d21 and d41) and duodenal IL1 β gene expression (d41). In summary, combination of Eimeria challenge and feed outage induced more severe gut inflammation than either challenge alone, and both challenge conditions alone or in 12 ABSTRACTS OF PAPERS combination could be used to test the efficacy of feed additives in growth performance and gut health in broilers.

Key Words: Eimeria challenge, feed outage, inflammation, gut health, broiler