ORGANIC ACIDS + ESSENTIAL OILS COMBINED WITH AN ANTIBIOTIC GROWTH PROMOTER: EFFECTS ON GUT HEALTH AND NUTRIENT DIGESTIBILITY OF BROILERS CHICKENS

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Organic acids and essential oils have been studied as alternative to antibiotic growth promoters (AGP), however, there isn’t consistent information regarding the synergistic effect between them. The objective of this study was to evaluate a blend of protected organic acids + essential oils [P(OA+EO)] in combination with an AGP for broilers. Chicks (192; 1-28d) were divided in four treatments: negative control (NC), positive control (PC), AGP and AGP+P(OA+EO). Except the NC group, all birds were coccidiosis and *Clostridium perfringens* challenged. Analysis of ileum morphology, CD4+ and CD8+ cell counts were performed at 7, 14, 21 and 28d. Ileal digestibility was evaluated at 28d. The challenge increased the inflammatory cells infiltration in the lamina propria, CD4+ and CD8+ counts at 7 and 21d (P<0.01). Compared to PC group, the AGP+P(OA+EO) presented lower lamina propria thickness (P<0.10), reduced congestion (P<0.01) and higher number of CD4+ and CD8+ cells (P<0.01) at 7d; lower villus apical necrosis (P≤0.04) at 14d; lower congestion and CD4+ (P<0.01) at 21d. At 28d, the ileum cell dynamic of the AGP + P(OA+EO) group suggested a recovery of intestinal mucosa due to an increase of enterocyte proliferation, higher number of CD4+ and a reduction of CD8+ cells (P<0.01). In addition, the AGP+P(OA+EO) group had improved dry matter (P<0.01), crude protein (P≤0.08) and energy (P<0.01) coefficients of digestibility, and digestible energy (P<0.01) compared to AGP (difference of 184 kcal) and PC group (difference of 164 kcal). The use of P(OA+EO) with an AGP promoted positive effects for challenged broiler chickens.

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