

**INTESTINAL MUCOSAL MAST CELL IMMUNE RESPONSE AND
PATHOGENESIS OF TWO *EIMERIA ACERVULINA* ISOLATES
IN BROILER CHICKENS**

by

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Abbreviation Key: EA = *Eimeria acervulina*; EA1 = *Eimeria acervulina* isolate 1; EA2 = *Eimeria acervulina* isolate 2; PC = post-challenge; Trt = treatment; WG = weight gain; LCB = lower confidence bound; UCB = upper confidence bound

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ABSTRACT Five experiments were conducted comparing differential intestinal immune responses to two isolates of *Eimeria acervulina* (EA), EA1 and EA2. In three experiments, broiler chicks were divided into control (non-challenged), EA1, or EA2 challenged (14 days of age) groups. On day 6 post-challenge (PC), changes in body weight were determined, intestinal lesions were scored, and duodenal tissue was evaluated for morphometric alterations and mucosal mast cell responses. EA1 produced duodenal lesions and reduced villus height to crypt depth ratios when compared to controls; however, no differences were found in mast cell counts. EA2 produced differing results, and observed data were suggestive of an intestinal secretory response when compared to EA1 or controls. In Experiment 4, tissues were analyzed from day 2 through day 6 PC. Villus atrophy and crypt hyperplasia were heightened on day 5 PC in both challenged groups. Mast cell counts were significantly greater on days 3 and 4 PC in EA1 birds. In Experiment 5, EA2 oocysts were cleaned with 5.25% sodium hypochlorite to evaluate the possibility of a bacterial contaminant contributing to the pathogenesis of intestinal alterations. Weight gains were decreased by challenge and villus heights and crypt depths were significantly altered in challenged birds, resulting in lower villus to crypt ratios, however, there were no differences in mast cell number. These data are indicative of differential host response and immunovariability between different isolates of the same *Eimeria* species and are suggestive of mast cell involvement in coccidial immunity in broiler chickens.

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