



PhD Defence

Investigating the Effects of Coccidiosis on Amino Acid Digestibility and Utilization in Broiler Chickens Raised without Antibiotics

Emily Kim

Date: May 4th 2023 at 9:00am

The PhD Defence for Emily Kim has been scheduled for May 4th, 2023 at 9:00am. The defence will be held online via Teams and in 141: https://teams.microsoft.com/l/meetup-join/19%3ameeting_NjA1OTg2NTQtYWJkNy00YmZkLTlhNTItZDQzYTc3OWNiYzI3%40thread.v2/0?context=%7b%22id%22%3a%22be62a12b-2cad-49a1-a5fa-85f4f3156a7d%22%2c%22oid%22%3a%22fbd28915-dda5-478f-8ecb-a3682dcf0c3a%22%7d

3ameeting_NjA1OTg2NTQtYWJkNy00YmZkLTlhNTItZDQzYTc3OWNiYzI3%40thread.v2/0?context=%7b%22id%22%3a%22be62a12b-2cad-49a1-a5fa-85f4f3156a7d%22%2c%22oid%22%3a%22fbd28915-dda5-478f-8ecb-a3682dcf0c3a%22%7d

The exam committee will consist of:

Examining Chair: Dr. Lee-Anne Huber

Advisor: Dr. Elijah Kiarie

Adv. Committee Member: Dr. John Cant

Additional Graduate Member: Dr. Anna Kate Shoveller

External Examiner: Dr. Woo Kyun Kim

Abstract:

Coccidiosis is an avian parasitic disease, caused by the protozoan genus *Eimeria*, and a significant contributor to economic losses in poultry production due to its detrimental effects on nutrient absorption and growth performance. A meta-analysis was first completed to summarize and quantify the effects of an *Eimeria* infection on the AID of AA in broiler chickens. Experiment 1 was conducted to determine the SID of AA of main feed ingredients either fed as a single ingredient-based diet or a mixed ingredient-based diet to broiler chickens infected with *Eimeria*. Experiment 2 evaluated the effects of Gln and Glu supplementation as a potential strategy to mitigate the negative effects of *Eimeria* in broiler chickens. The meta-analysis confirmed that AID decreased for all AA except Trp and found that Cys, Arg, and Met digestibilities were the most affected by an *Eimeria* challenge. Experiment 1 found that while *Eimeria* challenge reduced plasma availability and SID of most AA; the impact was dependent on the main ingredients potentially due to unique chemical differences. Experiment 2 found that supplementation of Gln and Glu increased growth performance of broilers during the pre-challenge phase (day 0-10), but had no effect on post-challenge growth performance, plasma AA concentration, histomorphology, and breast weight. In conclusion, *Eimeria* challenge was confirmed to decrease AID and SID of most AA, with the largest effect found in the AA that play a role in maintaining gastrointestinal health. However, supplementation of Gln and Glu had negligible effect in protecting or restoring intestinal morphology post-challenge. Further research is still needed to optimize the supplementation of functional AA as a potential dietary strategy to mitigate the negative effects of coccidiosis.