



PhD. Defence

Benchmarking Biological Indices of Commercial Broiler Chickens Reared on Conventional and Alternative Gut Health Management Programs

Lisa Hodgins

Date: April 7th 2022 at 11:45am

The PhD Defence for Lisa Hodgins has been scheduled for April 7th, 2022 at 11:45pm. The defence will be held online via Teams: https://teams.microsoft.com/l/meetup-join/19%3ameeting_OGQyODUxNjItNjI3ZS00N2U1LWIyNTUtYjhmMzkyMGJlOGRi%40thread.v2/0?context=%7b%22Tid%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. Angela Canovas

Advisor: Dr. Elijah Kiarie

Adv. Committee Member: Dr. Jim Atkinson

Additional Graduate Member: Dr. Mike Steele

External Examiner: Dr. Valerie Carney

Abstract:

The poultry industry has been progressively phasing out prophylactic use of antibiotics in broiler chicken production thereby mandating the industry to contend with less reliance on the use of antibiotics. Under current Canadian regulations, the majority of commercial broiler chickens are reared on one of three gut health management programs: 1) conventional (**CON**), where some medically important antibiotics (**MIA**) are allowed, 2) raised without medically important antimicrobials (**RWMIA**), and 3) raised without antibiotics (**RWA**). However, little is known on comparative growth performance and physiological responses of birds reared on these programs. Investigations reported herein focused on the application of commercial gut health management programs incorporating dietary strategies known to bolster gut health and function in the absence of antibiotics. Investigations included the assessment of several parameters related to overall performance, breast meat quality, gastrointestinal responses, plasma serology, and bone mineralization. Programs showed similar trends pertaining to growth performance; however, differences in breast meat traits were reported. Condemnations were higher under commercial conditions and mortality was higher under commercial and research settings where birds were reared on programs with less reliance on antibiotics. Differences in organ weights and jejunal histomorphology which are known to impact growth rate and feed efficiency were observed in response to gut health management program. However, further analyses among such variables correlated with heavier birds but did not necessarily impact overall feed efficiency. Program effect on cecal short chain fatty acids (**SCFA**) was noted which could reflect microbial activity in the ceca. Differences in some plasma metabolites and tibia attributes suggest altered metabolism possibly linked to gut health management programs and their ability to support gut integrity and function in the absence of antibiotics. Overall, birds reared on the gut health management programs did not show growth performance differences in the absence of antibiotics, while some differences were noted regarding gut physiology, cecal SCFA, plasma serology, and tibia attributes. Data suggests that while gut health management programs appear to be effective in supporting performance in the absence of antibiotics, there are some fundamental metabolic differences occurring which are contributing to differences in physiological parameters.