UNIVERSITY of GUELPH

ONTARIO AGRICULTURAL COLLEGE

DEPARTMENT OF ANIMAL BIOSCIENCES

PhD. Defence

Dietary Berry Pomaces and exogenous Enzymes for Health and Productivity of Broiler Chickens

Munene Kithama

Date: September 7th 2022 at 9:00am

The PhD Defence for Munene Kithama has been scheduled for September 7th, 2022 at 9:00am. The defence will be held online via Teams and in 141: https://teams.microsoft.com/l/meetup-join/19%3ameeting_OGU3MGYwZmMtYmJhZC00Y2I1LTg4ZDUtMzE5OWY4YWFiMzc5%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. Ming Fan

Advisor: Dr. Elijah Kiarie

Adv. Committee Member: Dr. Moussa Diarra

Additional Graduate Member: Dr. Keith Warriner

External Examiner: Dr. Debabrata Biswas

Abstract:

Fruit pomaces are rich in functional phytochemicals that could be beneficial in antibiotic free and organic poultry production. This work investigated nutritional and functional effects of pomaces in broiler chickens without or with feed enzymes (ENZ). The first study investigated the apparent metabolizable energy (AME) of apple (APL), grape (GRP), cranberry (CRP) and low-bush wild blueberry (LBP) pomaces. Results revealed that the highest AME was observed with APL and that ENZ had no effect on AME. Plasma metabolites suggested that CRP and LBP had potential to lower plasma cholesterol concentration, and that ENZ influenced various functional pomace attributes. With LBP and CRP having better nutrient and functional attributes than APL and GRP, the second study determined the effects of CRP and LBP, with or without ENZ on growth performance, cecal microbiota and antimicrobial resistance profile of *Escherichia coli*. Data showed that birds fed bacitracin methylene disalicylate (BMD) and LBP had better feed conversion ratio (FCR) than birds fed CRP in starter phase. Feed enzyme significantly increased the abundance of *Proteobacteria* while *Bacteroidetes* abundance was increased due to both berries. Inclusion of berry pomace was found to modulate antimicrobial resistance profile of cecal *E. coli.* The third study was an *Eimeria* ssp. challenge trial that aimed to evaluate the efficacy of CRP and LBP in controlling coccidiosis. Data revealed that berry products compared well with salinomycin in mitigating *Eimeria* infections The results of this research show that berry products could meet the organic and antibiotic-free poultry sectors' needs.