



PhD. Defence

Investigating the role of genetics in breast meat quality and white striping in Canadian turkeys

Ryley Vanderhout

Date: January 20th 2022 at 2:00pm

The PhD Defence for Ryley Vanderhout has been scheduled for January 20th, 2022 at 2:00pm. The defence will be held online via Teams: [https://teams.microsoft.com/l/meetup-join/19%3ameeting\\_YzZmNWMYMTgtMzFIYy00ZGMylWI3MjctZDAyMzc1NTM0YTgw%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](https://teams.microsoft.com/l/meetup-join/19%3ameeting_YzZmNWMYMTgtMzFIYy00ZGMylWI3MjctZDAyMzc1NTM0YTgw%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. Anna-Kate Shoveller

Advisor: Dr. Christine Baes

Adv. Committee Member: Dr. Shai Barbut

Additional Graduate Member: Dr. Andy Robinson

External Examiner: Dr. Sammy Aggrey

**Abstract:**

The prevalence of meat quality defects, such as pale, soft, exudative (PSE) meat, and muscle myopathies, such as white striping (WS), have been of increasing interest to the poultry industry over the past few decades. The rise in prevalence of quality defects and myopathies are thought to be closely associated with the drastic changes in growth rate due to improvements in management, nutrition, and genetic selection. Research surrounding these traits in turkeys is limited, therefore, the objectives of this thesis were to provide a better understanding of the role genetics plays in breast meat quality and WS in Canadian turkeys and outline the relationships among these traits and other economically important traits such as body weight and feed efficiency. We first tested the reliability of a four-category severity scoring system for WS adapted from broiler chickens. After this system was found to be reliable within and between observers, it was used to score a large population of turkey toms for WS. In study 2, genetic parameters of breast meat colour, pH, and WS were estimated. These traits were estimated to be moderately heritable and various unfavorable correlations between these traits and economically important traits were reported. Finally, given the moderate heritability of WS estimated in the second study, the genetic architecture of WS was further investigated by means of a genome-wide association study (GWAS) followed by functional analysis. The findings of this study supported that of previously published work in broiler chickens which suggests that the biological limits of the circulatory system have been reached resulting in ischemic conditions in the muscles and development of WS. Although continued research is needed to further understand the various aspects that influence turkey meat quality and the presence of myopathies, this thesis adds to the body of knowledge surrounding the genetic factors affecting these traits in turkeys.