

MSc. Defence

PHENOTYPIC AND GENETIC ANALYSES OF HEAT TOLERANCE IN HOLSTEINS USING NASA  
PREDICTION OF WORLDWIDE ENERGY RESOURCES (POWER) WEATHER DATA

Paige Rockett

Date: July 8th, 2021 at 1:30pm

The MSc Defence for Paige Rockett has been scheduled for Thursday July 8th, 2021 at 1:30pm. The defence will be held online via Teams: [https://teams.microsoft.com/l/meetup-join/19%3ameeting\\_ZDA5YzFjMTYtZjc3NS00MDkxLTg0MjltYmY5Y2MxMjVjMDgx%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_ZDA5YzFjMTYtZjc3NS00MDkxLTg0MjltYmY5Y2MxMjVjMDgx%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. Vern Osborne

Advisor: Dr. Flavio Schenkel

Adv. Committee Member: Dr. Filippo Miglior

Additional Member: Dr. Angela Canovas

**Abstract:**

Heat stress can negatively impact the sustainability and productivity of a dairy production system even in temperate regions such as Canada. A possible mitigation strategy is to use genetic selection to improve heat tolerance. However, it is difficult to study heat stress using weather station data due to the sparsity of stations and inconsistencies within datasets. Therefore, the aim of this study was to assess the impact of heat stress and to estimate genetic parameters for heat tolerance in Canadian Holsteins using an alternative meteorological data resource known as NASA POWER. The results showed that NASA POWER estimates were closely correlated to weather station values and revealed that heat stress negatively affects milk, protein, and fat yield in Canadian dairy cattle, there is individual variation in heat tolerance which has a low to moderate heritability, and a genotype-by-environment interaction may strongly effect milk and protein yield causing the re-ranking of top-ranked bulls in different thermal environments.