

Robert J. Wester

Development of the Climate Master Cattle

Supervisor: Dr. John Church

Committee Members: Dr. Joanna Urban, Dr. Dipesh Prema, and Dr. Paul Adams

Abstract:

The Development of the Climate Master Cattle project aims to address the pressing challenges posed by climate change by creating a climate resilient beef cattle with high-quality meat. By selectively breeding animals with the thermotolerant SLICK trait, found in Senepol cattle, our initiative seeks to produce livestock capable of thriving in extreme temperature conditions.

First, SNP genotyping was used to identify key genetic markers associated with the SLICK trait, enabling us to track and propagate this essential characteristic in subsequent generations. Next, we are meticulously assessing the SLICK trait's impact on cattle physiology by measuring respiration rates, internal rumen temperature, activity levels, heat shock protein 70 gene expression, and heat shock protein 70 plasma concentrations providing valuable insights into its thermotolerant mechanisms.

Our breed is designed to offer premium-quality beef by combining the lean attributes with the exceptional marbling found in Akaushi (Wagyu) cattle. To monitor the inheritance of fat marbling across generations, we plan to conduct a Genome-Wide Association Study (GWAS) using the Illumina iScan to pinpoint the genetic markers associated with fat marbling.

While some aspects of the project are still underway, the Climate Master Cattle initiative represents a holistic approach to climate adaptation and sustainability in beef production, combining genetic techniques with phenotypic analysis. This project offers a promising path forward in ensuring the resilience of livestock in an era of climate change while delivering a superior beef product to meet growing consumer demands.

