

RESEARCH PROJECT – REPORT SUMMARY

PROJECT NAME

REPORT DATE

UBC – Calf Nitric Study

2019

EXECUTIVE SUMMARY

Typically, dairy bull calves are undervalued as beef producers. Recently it has been shown that dairy bull calves can be used in a new intensified beef process using "sprouts" that renders a high value-added "grass fed" carcass that grades AAA at 14 months of age. However, experience shows that these animals have a very high-risk of early morbidity and mortality (10-20%) and are typically rescued by antibiotic therapy. We planned to formulate a metaphylactic **treatment strategy for these dairy bull calves** that are being re-purposed in intensified beef production (RPDC) with gaseous nitric oxide (gNO) therapy, a naturally-occurring antimicrobial molecule in mammals as an alternative therapy to antibiotics.

KEY FINDINGS

These results suggest that inhaled gNO reduced the need for antibiotics with an incidence of 35% as compared to 50% in the placebo-controlled arm and the standard of care arm 60%). These results justify further evaluation in a larger trial.

We sequenced 16Sv4 amplicons generated from Nasal_swab samples on a MiSeq. MiSeq-generated Fastq files were quality-filtered and clustered into 97% similarity operational taxonomic units (OTUs) using the mothur software package [<http://www.mothur.org>]. The resulting dataset had 2272 OTUs (including those occurring once with a count of 1, or singletons). An average of 43226 quality-filtered reads were generated per sample. Sequencing quality for R1 and R2 was determined using FastQC 0.11.5. We think the results showed a diversity in bacterial species between the baseline swabs and the swabs after 5 days of gNO administration. The data from this analysis is very complex and due to cost restraint not yet fully analyzed. We will pursue further review and a deeper analysis once the COVID pandemic is over

COLLABORATORS

Principal Investigator: Dr. Chris Miller, Ph.D (Experimental Medicine), BA, RT

Co-Investigators: Lara Hirowatari, BSc, Dr Bevin McMullin Ph.D, BSc., RRT, Dr. Lauren Lyzenga, DVM, Dr John Church, Bill Vanderkooi, MSc, Cassandra Bucker, Ray Kaufman.