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Three student positions are available at University of Manitoba.

Please contact Dr. Kim Ominski:

Dr. Kim Ominski

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Positions:

1. Post-doctoral student, to work in forage utilization and cow efficiency.
2. Master's student, for Fall 2016 or Winter 2017 start, in relation to work on cow overwintering on pasture. Includes forage species evaluation, energetic efficiency, grazing behaviour.
3. Master's student, for Fall 2016 or Winter 2017 start, in relation to carcass work in this project:

Fetal Programming Project:

Impact of winter feeding and vaccination strategies on carcass outcomes in beef cattle

Project Collaborators:

Kim Ominski, Argenis Rodas-González, Karin Wittenberg, Emma McGeough (University of Manitoba)
Kim Vonnahme, Kendall Swanson, Marc Bauer, Carl Dalgren, Eric Berg, Gerry Stokka, Allison Ward (North Dakota State University)
Jennifer Aalhus, Oscar Lopez, Karen Schwartzkopf-Genswein (AAFC)
Al Schaeffer (Animal Infometrics)

Project Overview:

Carcass quality is impacted by feeding and management strategies used well before cattle reach the feedlot. Increased nutrient demand and reduced forage quality associated with winter feeding strategies may lead to nutrient deficiencies in pregnant cattle impacting: fetal muscle development, weight gain, carcass weight, back fat and marbling (Funston et al. 2012). Vaccination strategy may also impact carcass outcomes of the offspring (Rey et al., 2014).

Objectives are to identify:

- 1). Impact of maternal nutrition in steers from supplemented and non-supplement cows using a unique restriction model which reflects the western Canadian production environment on growth performance, uterine blood flow, and circulating metabolic compounds in nutrient-restricted (NR) and non-restricted (NOR) cows and determine subsequent impact on nutrient/metabolite availability, growth, muscle development as well as carcass outcomes in their offspring.
- 2). Impact of injection techniques using needle-free (NF) vs. needle syringe (NS) injections on carcass outcomes, including injection site reactions.
- 3). Potential management strategies to improve cow performance as well as growth and carcass outcomes of the progeny.

Phase 1:

Forty-eight cows confirmed pregnant with steer calves via ultrasound were selected and assigned to one of two forage-based diets: 1) Control diet - 100% NRC requirements for protein and energy 2) NR diet - 90% of control diet for energy (a 10% restriction) starting at day 110. Restriction was initially targeted at 20-30 % however several cows became impacted from the high fiber diet. Following the death of one cow as a consequence of impaction, the nutrient restriction was modified to a 10% restriction. Performance (body weight, condition score), uterine blood flow and blood metabolites (glucose, blood urea nitrogen, insulin, IGF-1, non-esterified fatty acids (NEFA) and thyroid hormones) have been examined at 28-d intervals from day 110 of gestation. Cows began calving on April 8 and to date 33 calves have been born. At birth, performance and blood metabolites as described above have been measured. Calves will be vaccinated at 60 days of age using a NS on the right side of the neck with a clostridial vaccine, while the remaining 24 calves (NR=12 and NOR=12) will be vaccinated using a NF system (right side) and boosted according to manufacturer's instructions. Calves will be assessed for the presence of lesions using infrared thermography on days 21, 42, 119 and 140 post-vaccination.

Phase 2:

Weaned steers will be transported to Manitoba and grazed at the MBFI site located near Brandon, Manitoba. Growth performance will be determined every 28-days for a two-month period. Forage intake will be recorded during this time using the alkane bolus technique. Following the pasture period, calves will be transported to the Glenlea Research Station, weighed, vaccinated, implanted, and fed to finish. Steers will be slaughtered in Manitoba. Carcass pH and temperature will be recorded. At 24 h post mortem, complete grade data and instrumental colour measurements will be collected. Muscle samples will also be examined to determine the fibre type, fibre area, percent of total cross-sectional area occupied by each fibre type. Both sides of the neck will be sliced and visually inspected for lesions. If present, lesions will be excised, weighed and preserved for histological examination. The strip loin will be stored until 15 d post mortem and purge loss determined. Shear force, fragmentation index, collagen analysis and objective colour measurements will also be measured.