



MSc Defence

The Immunological Impact of Selenium Supplementation in Ewes during the Late Gestation and Post-Partum Periods

Rebecka Sadler

Date: Monday August 11, 2025 at 1:00pm

The PhD Defence for Rebecka Sadler has been scheduled for August 11, 2025 at 1:00pm. The defence will take place in ANNU 141 and on Teams: https://teams.microsoft.com/l/meetup-join/19%3ameeting_YjkgOTE1YzgtNjJlZi00ODM3LThlNzQtNmJkOWFiMTNjN2Y1%40thread.v2/0?context=%7b%22Tid%22%3a%22be62a12b-2cad-49a1-a5fa-85f4f3156a7d%22%2c%22Oid%22%3a%22dfbebf32-99ae-4022-a68f-422f93e11c7f%22%7d

Exam Committee:

Examining Chair: Dr. Elijah Kiarie

Advisor: Dr. Niel Karrow

Advisory Committee Member: Dr. Bonnie Mallard

Additional Member: Dr. Julang Li

Abstract:

Selenium (Se) is an essential soil mineral that can be incorporated into animal feedstuffs. Because of a lack of soil Se in some regions, organic or inorganic supplementation strategies must be implemented to prevent deficiencies and promote optimal ovine health. Therefore, the objectives of this study were to assess how inorganic versus organic Se supplementation influenced ewe Se status and immune function during late gestation and postpartum. Dorset Rideau ewes (n=110) were fed a Se deficient diet from gestation day 110 through postpartum day 49 and received one of four daily oral Se treatments diluted in 5 mL of sugar water: 0 mg Se, 0.3 mg inorganic Se, 0.3 mg organic Se, and 0.6 mg organic Se. Throughout the trial, the ewes received various immune challenges, including intramuscular immunizations with a novel antigen (ovalbumin; OVA) on trial days 0 and 10, a subcutaneous OVA challenge on day 20, and a lipopolysaccharide (LPS) endotoxin challenge on trial day 49. The organic Se treatment groups had higher serum Se concentrations for most trial days compared to the 0.3 mg inorganic and control groups ($p < 0.05$). However, no significant differences in innate or adaptive immune function were detected ($p > 0.05$). The results of this study indicate that organic Se supplementation can promote a higher Se status in ewes over time, but Se supplementation during this study period did not affect tested immunological parameters. This lack of difference in immune responsiveness between groups may be due to an absence of true serum Se deficiencies in the Se-deficient group or the levels of Se supplementation being insufficient to significantly improve immunocompetence.