



“Survey of cattle rumen microbiome under different natural grazing systems: linkage to grazing behaviour and productivity”

CHARACTERIZING THE RUMEN MICROBIOME DURING GRAZING

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Background: The microbial community in the rumen contains bacteria, archaea, protozoa and fungi that interact with each other and the host animal in complex ways to digest feed particles and provide energy to support cattle growth and production. This rumen microbiome has impacts on feed efficiency, dry matter intake, average daily gain, and methane production.

Previous research on the rumen microbiome has generally focused on cattle receiving standardized feedlot diets, but grazing systems are often more complex and diverse. Different nutrient sources can have a substantial impact on the rumen microbes, therefore the behaviour of the rumen microbiome under grazing conditions may be very different than in a feedlot system.

Objectives: The objectives of this study are to:

1. Assess variation in the rumen microbiome in 200 heifers and cows under three different grazing scenarios (tame pasture, deferred native grass, and stockpiled dormant native grass) over two grazing seasons
2. Determine rumen functional features and shifts in response to the different grazing scenarios and any contributions to cattle productivity

3. Determine the effect of breed composition on microbial heritability
4. Identify associations between the rumen microbiome and cattle phenotypes (growth, intake, feed efficiency, etc.)

Implications of the Research: This project will provide information about how the rumen microbiome changes under different grazing conditions. The key microbes, microbial genes and microbial metabolites identified in this project may lead to tools that can further optimize rumen function when cattle are consuming high forage diets or may be able to be incorporated into genetic selection efforts.

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