



Collaborative testing and development of forage barley varieties for western Canada

## DIGGING DEEPER INTO FORAGE DIGESTION EFFICIENCY

PROJECT NO.: FDE.07.20

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**Background:** Improving feed efficiency helps to reduce feed costs and reduce the environmental footprint of beef cattle production. While residual feed intake (RFI) has been used extensively in research situations to determine individual animal feed efficiency, there are often differences in RFI values in the same animals fed different diets or at different stages in their life cycle. Previous work demonstrated a large degree of variability (42-61%) in neutral detergent fibre (NDF) digestibility in cattle fed the same barley straw-based diet, leading to a need to identify the animal and microbial factors that drive individual animal variability in fibre digestion.

**Objectives:** The objectives of this study are to:

1. Determine differences in the microbial ecology of the rumen and/or hindgut between animals that differ in forage digestion efficiency.
2. Discover whether there are key genes and or microbes influencing forage digestion efficiency.
3. Investigate the role of animal physiology and host metabolism in forage digestion efficiency compared to the microbial processes.
4. Explore how forage digestion efficiency rankings may change due to changes to feed composition and how this relates to animal physiological and rumen microbiological parameters.

**Implications of the Research:** Understanding the mechanisms that cause some animals to digest forages more efficiently than others may help to develop tools to select animals that are more efficient on pasture or other high-forage diets, and lower production costs.

*This project is also supported by the Canadian Agricultural Partnership, Beef Cattle Research Council, Saskatchewan Cattlemen's Association, and NSERC*



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