ALBERTA AGRISYSTEMS LIVING LAB

Rotational Grazing

July 2025 (Preliminary Results)

Producers in Alberta have used rotational grazing to extend grazing days, improve pasture productivity, and reduce pressure on other grazing lands. Rotational grazing focuses on long-term sustainability by enhancing pasture resilience and regrowth through managed rest periods. By rotating cattle through multiple paddocks, they allow plants to recover, which helps maintain ground cover, reduce erosion, improve soil health, increase percentage of desirable forage species, improve nutrient cycling and enhance drought resilience.

The question posed, is rotational grazing financially viable and what environmental benefits accrue in different ecoregions? To answer this, scenarios were created that examine timing and type of benefits, intensity of the practice and infrastructure costs.

Considerations:

1. **Timing:** Properly timed rotations help maintain forage productivity, prevent overgrazing, and support long-term soil and plant health across diverse prairie landscapes. Very critical in drier climates.
2. **AMP vs. Longer Rotations:** Research has shown a difference in the benefits accrued from adaptive multipaddock (AMP) grazing and longer rotations. AMP requires more labour with frequent moves, but demonstrates larger benefits in grass productivity. This study used weekly rotations and a stocking rate increase of 18%.
3. **Overgrazing**: Disrupts the recovery cycle, lowers pasture productivity, reduces carbon sequestration, and undermines the long-term sustainability of the system.
4. **Initial infrastructure costs**: Fencing and water systems can be a large investment that may be a barrier for producers to adopt.
5. **Water availability**: Rotational grazing requires water accessibility that can be a barrier, particularly in drier regions where water sources are few and far between.
6. **Financial Benefits**: The short-term financial benefits included an 18% increase in stocking rate that was assumed to reduce winter feeding days. When a water system was included, there was a 0.19 lb/day increase in average daily gain.

The following three scenarios were run on 47 benchmark farms from the Canadian Cow-Calf Cost of Production Network and Alberta AgriSystems Living Lab, using 2022 data. These benchmarks represented different production and management systems across Canada.

Scenarios

The **Basic Rotational Grazing (RG) scenario**, assumed an 18% increase in stocking rate which extended summer grazing days while keeping the herd steady. This generally resulted in initial financial losses for many farms, with average and median declines in net income per cow. This scenario highlights the economic challenges associated with adopting rotational grazing, primarily due to upfront costs such as fencing and water infrastructure investments, as well as adjustments in labor and management. Despite these initial setbacks, the basic RG approach can improve pasture utilization and forage efficiency, laying the groundwork for potential long-term benefits. However, profitability under this scenario is highly variable and depends on farm-specific factors such as herd size, baseline feed costs, and regional environmental conditions. Overall, while basic RG alone may not immediately enhance farm profitability, it establishes a foundation for improved economic and environmental outcomes when combined with supportive funding and management strategies.

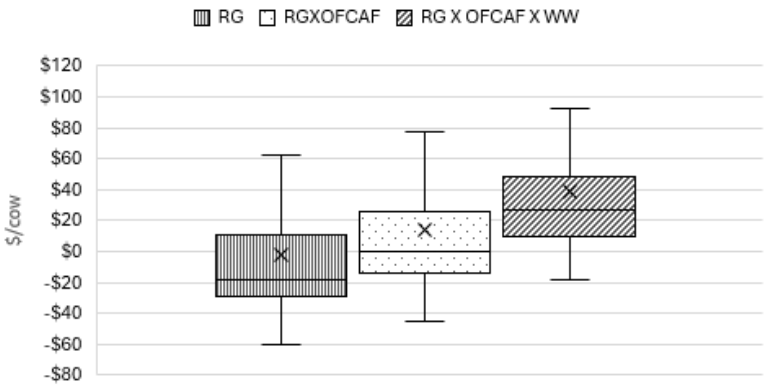
The **OFCAF scenario** incorporates government On-Farm Climate Action Funding to help offset the initial investment costs such as fencing and water infrastructure. This financial support improves the economic outcomes for farms adopting rotational grazing. The presence of OFCAF funding increased the proportion of profitable farms from 36% to 53%, indicating that funding plays a critical role in enhancing the financial viability of rotational grazing systems. However, while funding shifts outcomes favorably, it does not significantly reduce the variability in profitability across farms, suggesting that other factors also influence economic success under this scenario.

The **Weaning Weight (WW) scenario** is based on research that finds that an off-site watering system increases weaning weights of calves. This weight increase occurs because cleaner water is more palatable, so cattle drink more, leading them to eat more forage which increases growth. This had the most significant positive economic impact among the scenarios, with an average net increase in profitability. This scenario reflects substantial improvements across all profitability quartiles and ranges, primarily driven by immediate gains from more pounds sold and higher returns on investment. Additionally, the weaning weight scenario shows a slight reduction in greenhouse gas emissions intensity compared

to the baseline and basic rotational grazing scenarios, as productivity gains reduce emissions intensity, although these reductions are modest and not statistically significant.

Economic Results

***Figure 1**: Net Profitability of Rotational Grazing Scenarios*



The net change in profitability from adopting rotational grazing varies significantly depending on the scenario and farm characteristics. In the basic RG scenario, most farms experience a negative economic impact, with an average net loss of $2.40 per cow and a median loss of $18.07 per cow over a five-year period primarily due to upfront costs like fencing and water systems. Farms with higher baseline feed costs tend to have greater potential for profitability gains, while those with lower feed costs generally see negative changes. When government funding through OFCAF is included, the average net change improves to a positive $13.73 per cow, and a median benefit of $3.06 dollars per cow. The proportion of profitable farms increases from 36% to 53%, when weaning weights were included this increased to 83%. The most substantial positive net change occurs in the weaning weight scenario, with an average net benefit of $38.74 per cow and a median increase of $27.35 per cow, driven by more pounds sold and improved returns on investment.

Key Takeaway: Description of Farms

Farms with an Economic Net Benefit	Farms with an Economic Net Cost
Avoided high baseline winter feed costs ($/head/day) by extending their grazing days	Had low baseline winter feed costs, therefore minimal cost savings through extended grazing days
Avoided purchasing winter feed by extending grazing days	Have no purchased feed, 100% homegrown
Experienced heavier weaning weights by implementing water systems	Have existing water systems resulting in minimal weaning weight benefit
Labour intensive farms that were able to reduce labour hours.	Labour simply shifted from winter to summer.

Overall, profitability outcomes are influenced by factors such as herd size, feed costs, and funding availability.

CO_2 Emissions Results

The CO_2 emissions results (modeled in Holos) indicate only marginal reductions in emission intensity across the rotational grazing scenarios compared to the farms original baseline. The mean emission intensity decreased from 13.34 Kg CO_2e/lb in the baseline to 12.31 Kg CO_2e/lb in the rotational grazing scenario and 11.79 Kg CO_2e/lb in the weaning weight scenario, but these differences were not statistically significant.

Emission intensity varied by soil type and region, with some provinces showing carbon sequestration benefits while others experienced carbon loss, highlighting the complexity of carbon dynamics in grazing systems. Overall, while rotational grazing may contribute to modest improvements in emissions efficiency, the results show high variability and no consistent significant reductions in CO_2 emissions across farms.

Key Takeaway: Description of Farms

Farms with an Environmental Net Benefit	Farms with an Environmental Net Cost
Low quality winter feed = no change in methane with more grazing days	High-quality winter feed = more methane with more grazing days
Farms with a medium amount of rainfall.	Farms with a low amount of rainfall.
Loamy/medium textured areas.	Sandy clay loam textured areas.

For More Resources:

See the Beef Cattle Research Councils' grazing management and water systems topic pages for more examples and tools to support implementation.

References

Beef Cattle Research Council. (2024). *Water systems for beef cattle*. BeefResearch.ca. https://www.beefresearch.ca/topics/water-systems-for-beef-cattle/

Alberta AgriSystems Living Lab. (2025). *An economic and environmental cost-benefit analysis of adopting rotational grazing in Canada*.