

## OPTIMIZING FEED AND FORAGE QUALITY

### ➤ BENEFICIAL MANAGEMENT PRACTICE (BMP) FOR GREENHOUSE GAS MITIGATION ➤

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*Methane is a GHG gas mainly produced during the digestion of feed*

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*Forage should be grown to optimize quality and quantity*

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#### ➤ BACKGROUND

- Enteric methane is produced by microbes during digestion of feed in the rumen of cattle.
- Between 2 and 11% of the feed energy offered to cattle is lost as methane.
- Enteric methane contributes 3% of total greenhouse gases (GHG) in Canada.
- The cow-calf sector feeds mostly high fiber forages and therefore produces the greatest amount of methane. Up to 78% of methane from cattle is produced by the cow-calf sector.
- Feeding cattle efficiently by offering high quality forages and formulating rations to meet animal requirements will lower methane emissions and improve energy utilization by cattle.
- Cow-calf producers manage much of the pasture land in Canada. Well-managed pastures remove GHGs (carbon dioxide) from the atmosphere through a process called carbon sequestration.



#### ➤ WHAT SHOULD WE DO?

- Grow, harvest and feed high quality forages.
- Formulate diets based on feed tests and feed to meet animal requirements.
- Manage pastures to produce high quality forage and avoid overgrazing.



### WHY SHOULD WE DO IT?

- Cattle can lose up to 1 in 10 bales worth of feed energy as methane when digesting low quality hay. Feeding high quality forages has the potential to reduce methane emissions by 8% (when crude protein is increased from 6.9 to 13.6%).
- Cattle that lose a higher percentage of their feed energy as methane are less efficient. This means that more days are required to reach a target gain and feed costs are higher for the producer.
- Feeding high quality grass and legume forages that meet animal nutrient requirements will improve production, shorten the time to reach a target weight or body condition score and lower feed costs.

### HOW SHOULD WE DO IT?

- Time forage harvest and grazing to coincide with peak quality to improve cattle average daily gain and reduce enteric methane emissions.
- For optimum forage quality, cut legumes in early bloom and grasses in early heading stage.
- It is paramount to keep your harvesting equipment in good condition in order to maintain hay quality. Dry matter loss from standing hay can occur during harvest. Mowing can cause losses of 2% and baling of 6%, but a poorly adjusted pick-up can cause losses of up to 12% of available dry matter.
- Consider covering or shedding your hay. Storage without cover can result in dry matter losses of between 5 and 35%, depending on the amount of precipitation, storage site and original bale condition.
- Implement planned grazing systems and avoid overgrazing pastures.
- Test your forages for nutrient composition to accurately formulate rations for efficient feeding.

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*Test your feed  
and forages for  
nutrient  
composition*

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## HOW DO WE KNOW THIS?

- Forages harvested at optimum maturity maximize digestible energy content and reduce enteric methane emissions - Boadi et al.
- Inclusion of legume forages harvested at optimum maturity will ensure adequate dietary protein and maximize digestibility - Blair
- Feeding to meet the nutrients required by all animal classes (i.e. lactating, dry, replacements) will improve productivity for cows and reduce the number of days on feed for growing animals.- Blair
- Cattle turn grasses, inedible to people, into high quality protein.




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*Improving feed  
quality will  
decrease GHGs  
produced per  
kilogram of  
beef*

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## OTHER BENEFITS OF WELL-MANAGED FORAGE AND GRASSLANDS

- Perennial grasslands protect sensitive lands from erosion.
- Perennial grasslands remove carbon from the air and store it in soil as root material (carbon sequestration).
- Perennial grasslands provide ecosystem services through habitat preservation and enhanced biodiversity.

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*Well managed  
grasslands  
grazed by cattle  
have many  
benefits*

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## POTENTIAL DISADVANTAGES OR UNCERTAINTY

- Dietary protein (nitrogen) in excess of animal requirements will be excreted. Feeding above requirements results in unnecessary feed costs and may have environmental implications via nitrates in water or nitrous oxide emissions from manure.

 RESEARCH HIGHLIGHTS

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*Funding for production of this factsheet was provided by the Government of Canada through the Agricultural Greenhouse Gases Program of Agriculture and Agri-Food Canada.*