

KEY FINDINGS

FOR GREENHOUSE GAS MITIGATION

Manitoba Beef Sector

INVEST.
BUILD.
GROW.



MANITOBA

1 Impacts of cattle diets on methane emissions

DID YOU KNOW? Cattle can lose up to **1 in 10** bales worth of feed energy as methane (CH₄) when digesting low quality hay



- Highly digestible feed results in a higher rate of passage and less enteric CH₄ as it has less time to be exposed in the gut to methanogenic bacteria
- High-quality forage from early summer pastures generate less enteric CH₄ than lower-quality pasture forage in mid summer¹
- Covering or storing hay in a shed can **reduce dry matter losses of between 5-35%**, depending on the amount of precipitation, storage site and original bale condition
- Alfalfa-grass pastures produce lower enteric CH emissions from grazing cattle than did pure grass pastures²
- Increasing the fat content of diets can decrease enteric CH₄ emissions³
- Development of a sound ration program to deliver required nutrients based on age and weight of animals will maintain a healthy and productive calf crop
- Feeding cattle forages harvested at optimum maturity maximizes digestible energy content and has the potential to **reduce CH₄ emissions by 8%** when crude protein is increased from 6.9 to 13.6%



2 Nitrous oxide

- Perennial forages like alfalfa can decrease N₂O emissions by **75%** compared to annual crops
- Enhanced efficiency urea can decrease N₂O emissions by about **50%** compared to conventionally broadcasted urea for early season wet and warm eastern Prairie conditions, indicating that changing the fertilizer source can decrease greenhouse gas (GHG) emissions

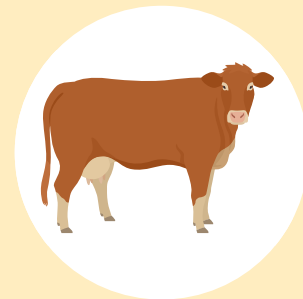
3 Soil carbon

- Well managed perennial grasslands remove carbon from the air and store it in soil as root material, also known as carbon sequestration
- Annual crops cause a carbon loss whereas perennial crops are usually carbon sinks (carbon retention) in the eastern Prairies
- Restored native prairie soil holds more carbon than annually cropped soil⁴



4 Production

- Culling the breeding cattle herd based on breeding soundness of bulls and cows will maintain a fertile and high producing herd, improving production efficiency and reducing feed costs
- Improving management efficiency may reduce average emission intensity by **31% on Canadian cow-calf operations**⁵



DID YOU KNOW? The GHG intensity of Canadian beef declined by **14%** between 1981 and 2011⁶

[1] Boadi et al. 2002. Can. J. Anim. Sci. 82(2): 125-131 [2] McCaughey et al. 1999. Can. J. Anim. Sci. 79: 221-226 [3] Boadi et al, 2004. Can. J. Anim. Sci. 84(3): 319-335; Mathison et al. 1998. Appl. Anim. Res. 14(1): 1-28 [4] Bell et al. 2012. Agric. Ecosyst. Environ. 158:156-163 [5] Alemu et al 2017. Agric. Syst. 158:1-13 [6] Legesse et al. 2016. Anim. Prod. Sci. 56: 153-168