![Eastern Canadian Galloway Association logo]

Galloways and Climate Change
The Rest of the Story

Greenhouse gas emissions and agriculture

10% of Canada's greenhouse gas emissions are from crop and livestock production. This excludes emissions from the use of fossil fuels or from fertilizer production.

The main gases emitted by agricultural activities are: Carbon Dioxide (CO2), Methane (CH4), Nitrous oxide (N2O), Conversely, agriculture helps slow climate change by storing carbon on agricultural lands. Storing, or sequestering, carbon in soil as organic matter, perennial vegetation, and in trees reduces carbon dioxide amounts in the atmosphere. (https://agriculture.canada.ca/en/environment/greenhouse-gases).

Nature's Way

Plants and trees are nature's way of dealing with carbon emissions, but this process produces cellulose which humans cannot digest. Ruminants like Galloways convert cellulose to beef and milk, an important part of your balanced diet.

"It's easy to get confused by the complexity of the issue of agricultural emissions, especially when it comes to human diets that are best for the planet. Greenhouse gases are only one part of assessing environmental sustainability.

For example, although cattle generate methane, they also produce a quality source of protein for human consumption, and their diets consist of grass and by-products from the food industry that would otherwise go unused.

Also, beef and dairy farms provide other ecological benefits, such as conserving biodiversity, enhancing soil carbon storage and health, improving water quality, and providing habitat for wildlife." (Dr. Karen Beauchemin, research scientist with Agriculture and Agri-Food Canada's (AAFC) Lethbridge Research and Development Centre)

Cow Farts

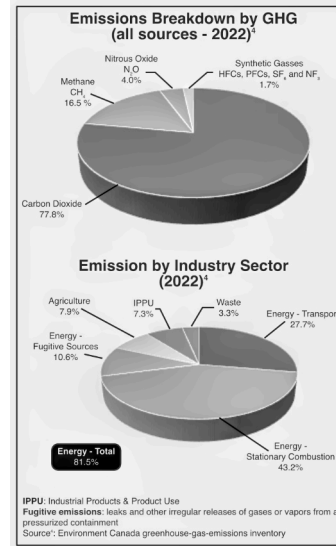Galloways and other ruminants don't have to apologize for the methane they produce. Ask your scientists to tell you the rest of the story! Farts and belches are part of nature's cycle. The methane is absorbed by the grasses cattle eat.[1]

Grass fed natural beef is environmentally sound. Methane and plays important roles in enhancing plant tolerance against abiotic (non-living))stresses, such as salinity, drought and heavy metal exposure while promoting root development. Methane also delays senescence (aging) and browning of plants.1 Through photosynthesis our grasslands also remove the other significant greenhouse gasses – nitrous oxide and carbon dioxide from the atmosphere.

"Ruminants (like Galloways) represent 11.6% of anthropogenic (ie, caused by humans) emissions while raising grains while the growing of legumes and grains contributes 13.6%. Ruminants consuming only grazed forages results in more carbon sequestration than emissions."[2]

Greenhouse Gas Emissions[3]

"The main gases emitted by agricultural activities are carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). 10% of Canada's greenhouse gas emissions are from agriculture which includes both crop and livestock production. This total excludes emissions from the use of fossil fuels or from fertilizer production."[3]

Emissions Breakdown by GHG (all sources - 2022)[4]

- Nitrous Oxide N_2O 4.0%
- Methane CH_4 16.5%
- Synthetic Gasses HFCs, PFCs, SF_6 and NF_3 1.7%
- Carbon Dioxide 77.8%

Emission by Industry Sector (2022)[4]

- Agriculture 7.9%
- IPPU 7.3%
- Waste 3.3%
- Energy - Transport 27.7%
- Energy - Fugitive Sources 10.6%
- Energy - Stationary Combustion 43.2%
- Energy - Total 81.5%

IPPU: Industrial Products & Product Use
Fugitive emissions: leaks and other irregular releases of gases or vapors from a pressurized containment
Source⁴: Environment Canada greenhouse-gas-emissions inventory

The main source of fertilizer in livestock production is organic manure. As noted in the quote above, Agriculture Canada includes the emissions that occur in the breakdown of manure from livestock production, but does not include the emissions from the production, distribution of chemical fertilizer or the added machine time in the fields for fertilizer application, crop spraying and harvesting required in grain and legume production.

One must also note that farmers help slow climate change by storing carbon on agricultural lands by sequestering carbon in soil as organic matter. The best crops for this sequestration is perennial vegetation. Grasses used in grazing are therefore, an important factor in reducing greenhouse gasses from the atmosphere.

As the chart above shows, 81.5% of Canada's greenhouse gasses are produced by carbon emitting industries, transportation (27.7%), stationary combustion sources such as power plants, industrial facilities and home heating (43.2%) and fugitive sources such as leaks and other irregular releases of gasses or vapours from pressurized containment (10.6%).

Through improved practices, greenhouse gasses from agriculture have declined to 7.9% of the Canadian total emissions.

Organics Naturally[3]

Manure is an essential component of modern farming systems.

The nutrients contained in manure are absorbed by crops which then are fed to livestock. The livestock then excrete a portion of these nutrients in manure.

Although manure represents a disposal liability to the farmers; it also represents a resource, manure contains valuable nutrients which farmers applies to the land, providing valuable nutrients to the soil. These nutrients are available immediately for a plants use.

Livestock manure provides food for bacteria and earthworms, is an excellent soil conditioner and also aids in water retention.

Soil Health[3]

How Cattle Heal the Land:
A teaspoon of healthy soil houses about 10,000 living species of microbes. Tilling the land exposes these these anaerobic (living in absence of free air) organisms to air.

On our cattle farms we use natures way, self propelled fertilizer systems (also known as cows). As well as leaving a trail of organics (also known as cow poo or manure) on the land.

Cows also trample grasses which mechanically return the nutrients of grasses back into the land.

All this revitalizes the land so we can feed our cities forever.

LINKS TO RESEARCH

1: Li L, Wei S, Shen W. The role of methane in plant physiology: a review. Plant Cell Rep. 2020 Feb; 39(2):171-179. doi: 10.1007/s00299-019-02478-y. Epub 2019 Oct 23. PMID: 31646372.

2: The Role of Ruminants in Reducing Agriculture's Carbon Footprint in North America Journal of Soil and Water Conservation March/April 2016

3: Manure effects on soil organisms and soil quality Michigan State University Extension | Emerging issues in animal agriculture

4: Canada's official greenhouse gas inventory – Greenhouse gas sources and sinks in Canada: executive summary 2024

Nature's Circle – The Complete Story

Galloways and Greenhouse Gasses

The Cow Fart Cycle

Cows Fart producing methane

Methane promotes root development, an important source of carbon sequestration

Cows eat grass converting cellulose into useable food

Eastern Canadian
Galloway Association