

# Greenhouse Gas MITIGATION

A Beef Sector Report

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## REDUCING GREENHOUSE GAS EMISSIONS THROUGH "FEEDING AND BREEDING"

*Breeding for feed efficiency, as well as improving feeding strategies, can reduce methane emissions from beef cattle operations.*

Cattle can lose up to 12 percent of the energy in their feed as methane. Of the methane released yearly by Canadian agriculture, 97 percent is attributed to livestock. This is approximately three percent of the total greenhouse gas (GHG) emissions in Canada. It is also lost profit for beef producers.

The energy loss during feed metabolism occurs through a process that is unique to ruminant animals. When cellulose and starch are degraded in the gut of the animal and used as energy sources, some of the carbon is lost through the mouth as methane through burping. The amount of methane emitted depends on the efficiency of the animal, as determined by the genetics, as well as the composition and degree of processing of the feed.



*The federal greenhouse gas mitigation program is a multi-sector initiative that provides research demonstration sites and information for Canada's agricultural industry.*

Increased feed efficiency in cattle can have a significant effect on reducing GHG emissions and increasing productivity. Scientists are developing new selection tools to increase feed efficiency in cattle through breeding and new methods that enhance nutrient utilization in the rumen.

Canada's beef producers have already made great strides in adopting tools and techniques to improve feed efficiency. That, and producer ingenuity in designing new feeding systems, are helping to mitigate GHG emissions. Research promises still more options.

### NEW OPTIONS

Although GHG emissions from cattle are the result of a natural process, the process can be improved. Feed efficiency reduces GHG emissions, and it makes good business sense. Improved feed efficiency increases growth, cuts manure production and raises profitability.

Cattle come with genetic differences, just like people. Some are more efficient than others in utilizing the nutrients in their feed. The challenge for producers is to easily and efficiently identify the genetic lines of those cattle.

However, researchers have recently developed new and innovative genetic selection tools for feed efficiency and are working to make these tools practical and affordable. Also, new feeding strategies are being developed to boost feed efficiency in cattle.

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There is evidence certain feed additives have the ability to affect rumen bacteria, leading to increased feed efficiency and even improved carcass quality. Examples are oils and bioactive agents, such as tannic acid and ionophores.

Further scientific work is focusing on reproducing beneficial rumen bacteria in silage, which will then thrive in the rumen and improve feed utilization. Even basic grain-to-forage ratios are being re-evaluated for their effect on feed efficiency. For example, researchers are looking at which grain compositions and rations best complement certain forages to optimize digestion.

New information is available for the beef industry to integrate into day-to-day decision-making and more is coming, say scientists. Actively searching for ways to improve feed management and being open to change will have huge long-term benefits to increasing efficiency and reducing GHG emissions.

## READILY AVAILABLE TOOLS FOR EFFICIENCY

Producers do not have to wait for the key to optimal livestock production to be found. Many management tools are readily available today:

**Balancing diets.** Feeding more nutrients than can be absorbed by the animal will lead to a loss of the unused nutrients, increasing GHG emissions and manure output.

For example, forage quality varies with factors such as region, weather and plant material. By regularly analyzing the nutrient content of forage, producers can alter their grain and supplements to meet the nutritional needs of cattle without overloading on certain nutrients.

Related to ration-balancing is proper pasture management. Ensuring that pastures are in good health and making wise choices about species

combinations will increase the nutritional value of the forage and have a net reducing effect on emissions.

**Logistics.** Producers can benefit from analyzing the logistics of their operations. Evaluating the production system as a whole and comparing it to already known facts about productivity and GHGs can give producers new leads to develop better management practices.

An example of producer ingenuity is swath grazing, which may reduce costs, workload and possibly GHG emissions. These types of innovations are now being backed by new research documenting the effect of management strategies on whole systems and GHG emission patterns, and determining environmentally sustainable production practices.

## GREENHOUSE GAS CALCULATOR

The Canadian Cattlemen's Association (CCA) has produced a Greenhouse Gas Calculator in an effort to better understand the GHG emissions that result from Canadian beef cattle operations. This is a computer-based calculator that roughly quantifies the amount of carbon equivalents emitted and/or sequestered from a specific operation. Producers interested in getting the calculator are welcome to contact CCA.

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