ACTIVITY 6:
Let's Look At Protein – Part 3

PART 3

We all need food. To eat is to impact the environment because producing food requires the use of environmental resources such as air, water, sunlight, and soil nutrients. Canadian farmers are focused on using these environmental resources sustainably to produce safe, nutritious food at an affordable price. Farmers, using the latest in science and technology, are finding improved ways to increase food production, while decreasing its environmental impact.

Here are a few examples:

PLANT-BASED PROTEIN

- **Conservation or zero-till**. Not ploughing or turning the soil over can reduce soil erosion by 95% or more compared to ploughing the soil and can make the soil more resistant to erosion over time. Soil under no-till agriculture can store on average 29% more carbon than soil that is ploughed.

- **Genetically Engineered (GE) Crops.** Genetically engineered crops that are resistant to herbicides reduce the need to plough land to control weeds. Less ploughing means less soil carbon is released into the atmosphere.

- **Precision Agriculture.** Technology such as GPS guidance, drones, sensors, soil sampling and precision machinery, is used by farmers to make more informed decisions about their crops. This helps farmers do the right thing, in the right place, at the right time and grow the best crop possible with the lowest environmental footprint.

- **Including Legumes, like soybean, peas, beans, lentils, in the Crop Rotation**. Crop rotation is the practice of growing a different crop in a field each year over a period of 3 – 4 years. Unlike other plants, legumes can take nitrogen from the air and put it into the soil where plants can use it. Nitrogen is one of the main nutrients required by plants. Growing legumes reduces greenhouse gas emissions (GHGs) because less man-made nitrogen fertilizer needs to be produced and spread on legume crops. Both the production and spreading of man-made fertilizers requires the burning of fossil fuels. Growing legumes also improves the soil for next year's crop.

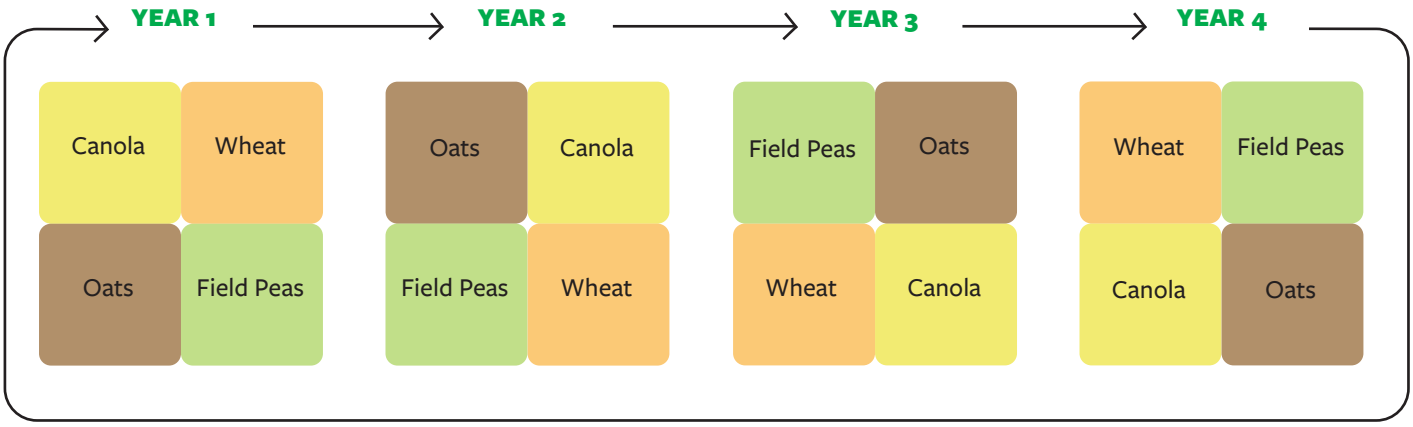
A common crop rotation used by Manitoba farmers is:

Year 1 – oilseed (canola, soybean, sunflower, flax)

Year 2 – cereal (wheat, barley, oats or corn)

Year 3 – pulse (field peas, lentils, beans, chickpeas)

Year 4 – cereal (oats, barley, corn or wheat)



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ANIMAL-BASED PROTEIN

Canada is one of the lowest GHG emitters for animal protein in the world. In Canada, it accounts for about 4% of our country's total GHG emissions.[10]

Producing 1kg of beef in Latin America, India or China generates twice the methane as in North America, Europe or Australia.[11]

The Grazers – such as cattle and sheep.

Nearly ¼ of Canada's total agricultural land is grasslands.[12]
This land is not suited for crops, but it can grow grass. Grasslands must be grazed to keep them healthy. Historically, our native grasslands were grazed by bison. Grazing allows the sun to reach the soil giving many different plant species the opportunity to compete and grow. Grass that is not grazed, grows tall, dies in the autumn, and forms a thick mat on top of the soil, making it difficult for the sun to penetrate and preventing the growth of many plant species.

Just 2 examples of threatened grassland species

Over time, a grassland that is not grazed loses its biodiversity because only a few vigorous, dominant grass species survive and grassland animal populations, many currently threatened, decline with the loss of habitat. Today, grazing cattle maintain the health of our grasslands and at the same time convert what for us is inedible grass into protein we can eat!

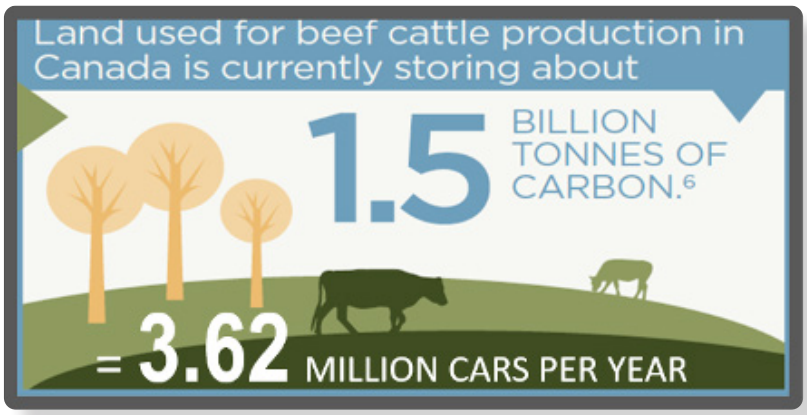
Proportionally, more of the Great Plains grasslands have been converted to cropland than the Brazilian Amazon rainforest has been lost to deforestation. [14]

The Great Plains of the Canadian prairies is 1 of 4 remaining endangered temperate grasslands ecosystems in the world. It is important that these delicate grassland ecosystems are not converted to crop production or developed for residential use but are maintained to protect habitat for wildlife, protect wetlands, reduce flooding and store carbon to offset greenhouse gas (GHG) emissions. [13]

Livestock's Environmental Footprint

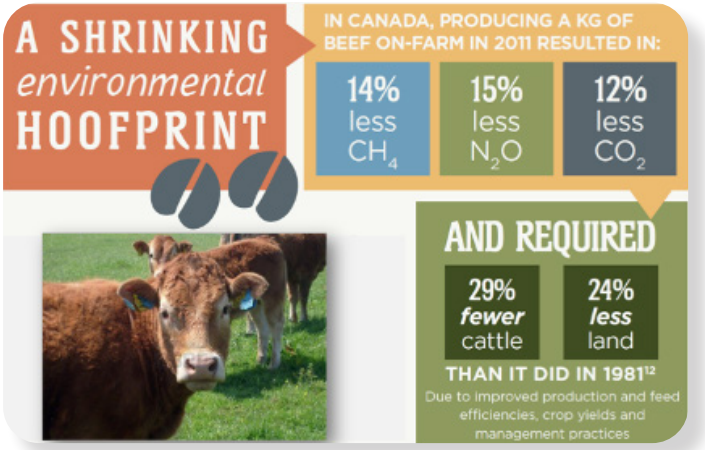
All of Canada's livestock industries are continually working to decrease their impact on the environment while still producing nutritious, safe animal-based protein. Science, technology and innovation have given farmers the tools to reduce their farms' environmental footprint. Innovations like:

- Improved breeding. Animals grow more quickly and bigger, so we need less feed, water, land and fewer animals.
- Improved diets. Better nutrition means animals grow more quickly, stay healthy and cattle burp fewer greenhouse gases.
- Improved manure (livestock poop) management. New ways of handling manure, which is used as a natural fertilizer for plants, has decreased pollution and greenhouse gas emissions.



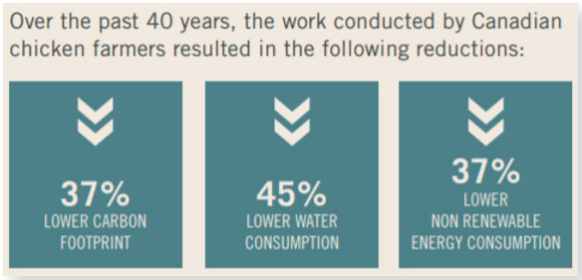
Here is a quick snapshot of what livestock farmers have accomplished so far:

- **Beef Producers:**



Alberta Beef Producers: https://irp-cdn.multiscreensite.com/f1ef9cf3/files/uploaded/609.pdf

- **Chicken Farmers**: Canadian chicken production has the world's lowest carbon footprint of any chicken producing region. Chicken Farmers of Canada, 1976-2016:



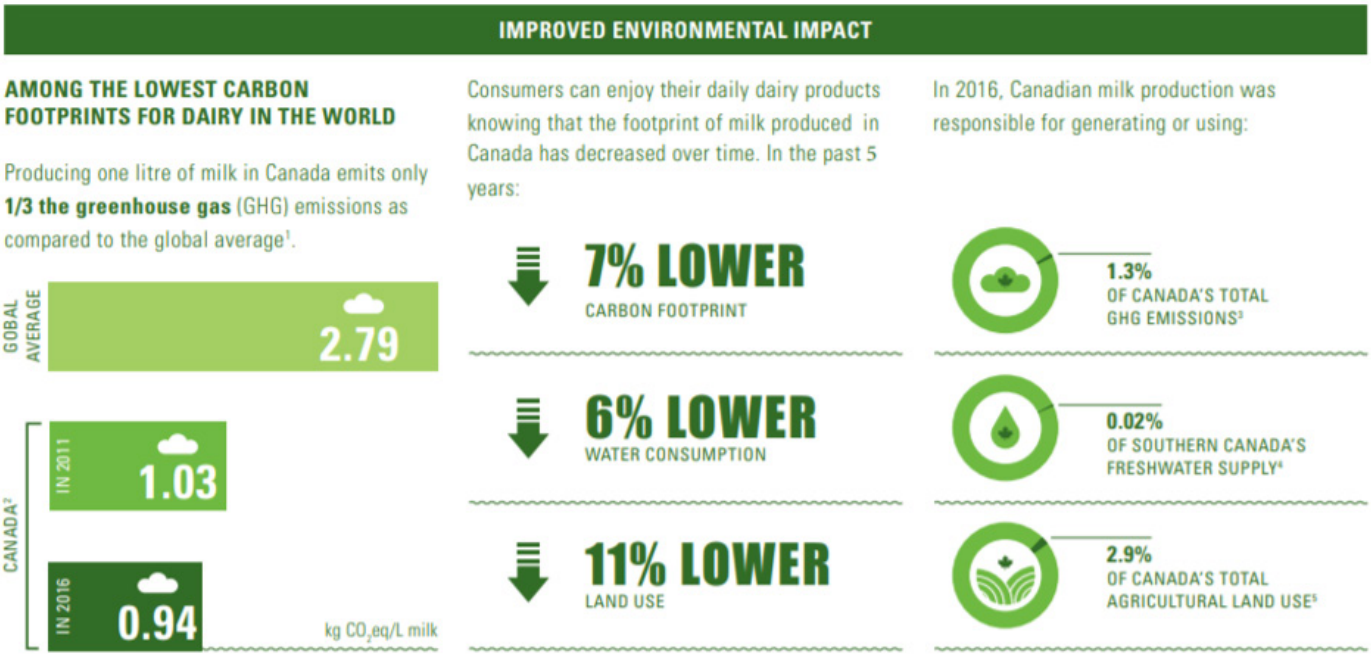
https://www.chickenfarmers.ca/wp-content/uploads/2018/08/CFC_ENG_F_Simple.pdf

- **Egg Farmers**: The environmental footprint of Canada's egg production supply chain declined by almost 50% between 1962 and 2012, while egg production increased by 50%. In that time frame, the Canadian egg industry used 81% less land, 41% less energy and 69% less water. The industry produced 61% fewer emissions that contribute to acid rain, 68% fewer emissions of nitrogen and phosphorus and 72% fewer greenhouse gas emissions.[16]

- **Pork Producers:** About 35% less GHGs are emitted from hog farms now than 50 years ago. It is estimated that in the last 50 years, the total of all-natural resources used by pigs has decreased by about 50% per kilogram of pork. For every kilogram of pork produced today, farmers use about 40% less water, 33% less feed and as much as 59% less land.[18]

- **Dairy Farmers:** Improvements to cow comfort and feed efficiency have helped make Canadian dairy more sustainable. Did you know it takes 65% fewer dairy cows to produce milk for all of Canada today than it did 50 years ago? [17]

https://dairyfarmersofcanada.ca/sites/default/files/2019-01/PLC-Info-ANG-F-17-12-2018_0.pdf



Canadian farmers are very proud of the work they have done to decrease their environmental footprint while still providing Canadians with abundant, nutritious, safe food. Canadian farmers are committed to supporting and adopting scientific research into methods for growing their crops and livestock that will further decrease the environmental footprint of food production.

How can you help decrease food's environmental footprint?

You can help decrease the environmental impact of food by decreasing the amount of food you throw away. Canadian farmers and the agriculture industry have become so successful at providing Canadians with abundant, safe, nutritious, inexpensive food that Canadians tend to take food for granted. Every time you throw food away you are not only wasting that food and the dollars spent to buy it, but also all the land, water, fossil fuels, greenhouse gas emissions and worker's time and energy used to grow, process and transport that food. It is estimated that consumers like you and me are responsible for 47% of the food wasted in Canada. That food waste creates about 56.6 million tonnes of greenhouse gas emissions.

Food waste thrown in the landfill gets buried under other garbage where, due to a lack of oxygen, it undergoes **anaerobic** decomposition which releases methane, a greenhouse gas. Methane has 25 times the global warming potential of carbon dioxide. It is better to compost food waste. Composted food waste is broken down by **aerobic** decomposition, a process which uses oxygen from the air and produces compost which is used as a fertilizer for growing plants.

AEROBIC:
with oxygen

ANAEROBIC:
without oxygen

YOUR ACTIONS CAN HELP SOLVE CANADA'S FOOD WASTE PROBLEM. YOU CAN TAKE ACTION BY:

- Make a shopping list and stick to it so you don't overbuy.
- Use leftovers, or freeze them for later use, instead of throwing them away.
- Serve yourself small amounts– you can always go back for seconds if you're still hungry.
- Compost food scraps.

DID YOU KNOW?

40%

of Winnipeg's residential waste is made up of compostable materials.

Livestock also help reduce food waste. By-products from food and energy processing, such as the canola meal left after the canola oil has been removed or distillers' grain that is left over after ethanol production, are fed to livestock instead of being throw away. Livestock also eat grains and legumes that, because of pest or weather damage, are not high quality enough for humans to eat. Livestock turn what would otherwise be food waste into high quality protein for our plates.

FOOD WASTE IN CANADA

THE FACTS

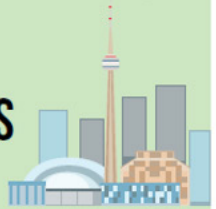
58%
of food produced in Canada is lost or wasted each year.

Food waste costs Canada's economy more than
$49 BILLION
each year.

35.5 MILLION TONNES
of food produced in Canada is lost or wasted each year.

32 %
of this, amounting to
11.2 MILLION TONNES
could be **rescued** to support communities across Canada.

This is equivalent to the weight of almost
95
CN TOWERS



Each year, food waste in Canada creates about
56.6 MILLION TONNES
of carbon dioxide-equivalent emissions.

Organics wasted in a landfill produce methane gas which is
25 TIMES
more damaging to the environment than carbon dioxide.

The average Canadian household spends
$1,766
on food that is wasted every year.

Source:
The Avoidable Crisis of Food Waste (2019): Roadmap; Second Harvest and Value Chain Management International

#WasteReductionWeek

WASTE REDUCTION WEEK IN CANADA

WRWCanada.com

Test Your Understanding

1. Describe one example of how crop farmers are reducing the environmental impact of growing plant-based protein.

2. Explain how growing legumes such as peas or beans helps to reduce greenhouse gas emissions.

3. Why is it important that our delicate prairie grassland ecosystems not be converted to crop production or developed for residential use?

4. Historically, bison were the grazing animals that kept the Canadian grasslands healthy. What grazing animal is maintaining the health of our endangered grasslands today?

5. Identify 3 ways that science, technology and innovation have been used to reduce the environmental footprint of livestock farming.

6. Pick one of the farm animals raised in Canada. For that animal, identify 3 facts about its environmental footprint today compared to the past.

7. When food is thrown in the garbage, describe what is being wasted besides the food and your money?

8. a. What percentage of food waste in Canada are consumers, like you and me, responsible for?

b. How many tonnes of greenhouse gas emissions are produced by that food waste?

9. Some food waste, such as eggshells and banana peels, is unavoidable. Explain why it is better to compost food waste rather than throw it in the landfill.

10. a. List 2 ways you can help reduce food waste.

b. Your ideas. Describe your tip for reducing food waste that is not already on the list above.

11. Explain how livestock help decrease food waste.