



25min Cattle and Land Usage Grade 7 Facilitator Notes

Objective: Students will make connections between their diet, cattle, land use, soil degradation & environmental impacts.



Recipe Category: Soil & Composting



Cooking Time: 25 mins



Level of Difficulty: Grade 7



Recipe Ingredients:

- Cattle cards (7)
- 1kg and 6kg weights (Katie)
- Umbrella for cow (with 7 pegs or clips to attach cards)
- 1L empty container or bottle



Curriculum Links:

Grade	Subject Area	Ontario Curriculum Links
	Social Science & the Humanities	<p><i>Understanding Life Systems – Interactions in the Environment</i></p> <p>Assess the impacts of human activities and technologies on the environment, and evaluate ways of controlling these impacts. (O)</p> <ul style="list-style-type: none"> ▪ 1.1 Assess the impact of selected technologies on the environment. (S) ▪ 1.2 Analyze the costs and benefits of selected strategies for protecting the environment. (S)
7	Geography	<p><i>Patterns in Physical Geography</i></p> <p>Identify patterns in physical geography and explain the factors that produce them. (O)</p> <ul style="list-style-type: none"> ▪ Identify the characteristics of the three types of agriculture – subsistence, commercial and specialized and the differing climate, topography, and soil conditions that are favourable to each type. (S) ▪ Describe how the following major factors influence commercial agriculture: location, climate, raw materials, market, labour, and transportation. (S)

Introduction: (5 mins)

- Introductions (who you are and what you're all about)
- Give a brief outline of the subject matter for this workshop (e.g. *The use of land for beef cattle in Canada and the environmental effects*) and what it means to you.
- Give an idea of what to expect from today's workshop.
 - Discussing the impact that human activities, in particular diets, have on the environment.
 - Learning about a specialized way of farming.
 - We're going to *meet our meat*, in a sense.

- Introduce the different types of farming:
 - **Subsistence Farming** – Farming for self-sufficiency (i.e. to feed you and your family) using a variety of crops and animals that thrive in that climate.
 - **Commercial Farming** – The production of crops for sale and widespread distribution to wholesalers or retail outlets. Also known as a “cash crop”. These farms can be small or large, but are usually fields with intensive plots requiring a number of expensive inputs (such as machinery, modified seeds, chemical fertilizers, etc.) and often end up being one crop-type (called “Monoculture”) to maximize profit.
 - **Specialized Farming** – Farming of only one type of plant, fruit, vegetable or animal, based on what survives and grows well in that climate (e.g. Christmas trees, apple orchards, beef cattle). Specialized farming is commercial farming, for profit, but with a specialized market.
 - **Organic Livestock or Cattle Farming** - Organic farming includes:
 - No use of antibiotics unless necessary,
 - The use of natural solutions for pest and weed problems,
 - No use of genetically modified organisms (GMOs).

Livestock is also allowed to roam around the farm and graze on foods that are also organic. This method of farming usually costs more money to maintain and generally does not yield the mass quantities of products that intensive farming does. This method of farming, however, is designed to be as environmentally friendly as possible. It does not take the same amount of toil on the land and surrounding areas as farming that involves harsh chemicals and overcrowded livestock populations. (From: <http://organic.lovetoknow.com>)

Food and Global Warming: (5 mins)

Begin the activity by asking students *what different factors contribute to Greenhouse Gases and global warming?* You'll likely get answers like: cars, planes, and cutting down forests...

Did you know – that farming and agriculture have a very significant impact on carbon emissions and contributes to global warming?

(Source: Greenpeace Canada)

*The total global contribution of agriculture on climate change is estimated to be between **8.5- 16.5 billion tonnes** of carbon dioxide (or up to 32% of all human-induced GHG emissions!).*

- *Ask the students to guess the number of 0's in the figure: **9 0's!** That's about **16 500 000 000 tonnes.***

Now we are going to look at how the agriculture industry contributes to global warming.

Meet your Meat (well, sort of): (15 mins)

1. Ask for one student to volunteer be the centre of the next activity (hold the umbrella and be the cow).
2. Distribute the “cattle cards” to the group. If there’s not enough for everyone, ask some students to pair up.
3. Have the “cow” stand in front of the group. As the cards get read, attach them to the umbrella using the pegs or clips.
4. Ask the students holding the following cards (in this order) to read them out and then come up and peg them onto the cow.
5. After each reading, discuss any key issues or words (see “facilitator notes” following each paragraph).
6. At the very end, quickly run through the different cards, make the connections between them and repeat key words. You can also use this time to prompt students to recall the different environmental issues that were discussed.

The cards read:

Greenhouse Gases:

Greenhouse gases are essential to keep us warm and comfortable here on Earth, but due to human activities such as burning fossil fuels, chopping down forests and using unsustainable farming methods, the “greenhouse effect” is on the rise and contributing to *global warming*. The main greenhouse gases in the Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone. The global contribution of farming and agriculture is up to 32% of all human-induced greenhouse gas emissions. *But what does this have to do with cows?* (Greenpeace Canada)

*Facilitator's Notes: Before we talk about cows, lets be clear about “global warming”. Basically, it’s an increase in the temperature of the Earth’s atmosphere. This increase in temperature can lead to changes in climate such as heat waves, unusual weather patterns, melting glaciers and rising sea levels. Let’s look at the impact that cows have on global warming...

Beef Cattle:

Did you know that eating meat causes more environmental damage than all transportation combined? “Beef Cattle”, the term used to describe cows that are raised for their meat, actually contribute up to 18% of the total Greenhouse gases known to cause climate change. But more on this later... Let’s start with this particular cow. It weighs 400 kilograms! *But where do they keep cattle cows?* (The Vegetarian Association)

*Facilitator’s Notes: Imagine this particular cow weighs a whopping 400kg! From that total body weight, the butcher can probably get around 140kg of edible meat. Let’s see what affect having many large animals farmed in one space has on the environment...

Deforestation:

In order to create space for *intensive farming* techniques, forests need to be cleared. In Canada, about 3.5 acres of land is used to feed each person – but that’s because we eat a lot of meat, around 100 kilograms each, per year! If we chose to eat less meat, some of these cleared forests could be returned to their former wilderness and natural ecosystems could be restored. This is because *a* lot of the 3.5 acres is actually used to feed the cow, not us. *But doesn’t the cow just eat grass?* (The Vegetarian Association)

*Facilitator’s Notes: Intensive livestock farming is a form of specialized, commercial farming for profit and is also known as factory farming. It is designed to make the highest profit from the least amount of labor and costs. For example, instead of being allowed to wander around pastures and munch on grass, cows are kept cramped indoors and forced to eat other stuff, let’s find out... (Adapted from: <http://organic.lovetoknow.com>)

Cow Feed:

Cows are naturally born to eat grass. It’s just what they do. But somewhere along the line, humans decided that cows being raised in intensive farms should actually eat grains, such as wheat, corn and soy, to make them grow bigger, faster. A lot of forest is cleared to make space to grow all of this wheat, corn and soy to feed the cows because it’s not a very efficient process. It takes 6kg of grains to produce enough energy for only 1kg of edible meat. Unfortunately, in order to keep up with demand, farmers growing cattle feed use a lot of pesticides, herbicides and fungicides that seep into

the soil and water ways. That's a whole extra environmentally destructive step in the food system that could be avoided if we ate less meat. *But how is the environment affected exactly?*

Facilitator's Notes: Did you know, that around 70% of our grain crops grown here in Canada go to cows, not people! It seems strange that so much land and so many resources would be used to create feed for cattle, considering they naturally want to eat grass AND we have millions of hungry people who don't get enough to eat. Unfortunately, our intensive methods of farming have lasting effects on the environment too; let's talk about water...

Water:

Remember that 6 kilograms of grain crops it took to make 1 kilogram of meat? Well it takes around 1,000-2,000 litres of water to grow every kilogram of grain – that's 6,000-12,000 litres of water for every kilogram of meat! So, if we times that by 140 kilograms of meat per cow, we need around 840,000 – 1, 680, 000 litres of water! That's a lot of water – and doesn't even include what the cow drinks directly! In addition to this overuse of water, there's also the problem of water contamination with chemical residues being used on the crops. *I wonder what else is floating in that water?*

Facilitator's Notes: By growing these grain crops to be inefficiently spent on feeding cows for meat, we're essentially wasting one of our most precious resources – water. To add insult to injury, this farming process of covering the crops in chemicals also damages our precious water and air.

Manure:

Cows poop. A lot. It's a natural progression for manure to make its way into the air, water and soil. Usually, animal manure would be considered good for the soil, right? Well, when you factor in all of those nasty chemicals that their feed is sprayed with, and the antibiotics they're fed to keep them from getting sick, it's not so great. Cows from industrial farms often have heavy metals, nitrogen, phosphates and methane in their manure. Methane gas has 21 times more global warming potential than carbon dioxide and is therefore a significant greenhouse gas.

Facilitator's Notes: Cows that are forced to eat grains, instead of grass, are more likely to have digestive problems, create more gas and get sick more often. Therefore, antibiotics play an important role on this kind of cattle farming. Methane gas is the third most abundant greenhouse gas, behind water vapour and carbon dioxide. The soil doesn't only suffer because of manure either...

Soil:

The soil degradation that happens as a result of intense cattle farming is a serious problem. Erosion refers to the loss of precious topsoil as a result of the loss of roots and cattle disturbing the land. Topsoil is roughly the top 2 inches of soil that contains the highest concentration of organic matter, microorganisms and is where most plants send their roots to collect vital nutrients for growth. On top of this is the problem associated with the compacting of the soil. Hundreds of 400 kilogram animals with hooves can really do some damage! Compaction reduces the air space within the soil, making it very difficult to absorb rain. As a result, rain runs right off, making erosion even worse!

*Facilitator's Notes: Topsoil is so sought after that you can actually buy it in bags at the store. We need our topsoil to make things grow and flourish. Cows that are raised more naturally are given the opportunity to roam amongst rotated fields of grasslands, as they would in nature. This way, there's less concentration of cattle, the grass has an opportunity to replenish and the soil is much healthier as a result.

Wrapping up with positive change: (any time leftover)

Discuss with the group how they can make changes to the issues they've discussed. For example,

- Eat less meat
- Support farmers that raise cows more naturally
- Tell you friends



Serving Suggestions:

The Cattle Cards look like this:

Greenhouse Gases

Greenhouse gases are essential to keep us warm and comfortable here on Earth, but due to human activities such as burning fossil fuels, chopping down forests and using unsustainable farming methods, the "greenhouse effect" is on the rise and contributing to global warming.

The main greenhouse gases in the Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone. The global contribution of farming and agriculture is up to 32% of all human-induced greenhouse gas emission.

But what does this have to do with cows?