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SPARK questions about **sustainability** MATTERS

PROJECT

Agriculture

What is the **environmental footprint** of our **food sources**?

Ecological footprints measure the demand for resources that human activities place on the environment.

human activities have an ecological footprint

Human activities consume resources, produce waste and have an impact on the environment. An **ecological footprint** is a way to measure the demand that human activities place on the planet.

Every person has an ecological footprint. So do households, towns, cities, businesses, industries, provinces and countries. An ecological footprint measures the food, transportation, energy use and goods and services that are consumed by these individuals, groups or areas.

An ecological footprint is usually expressed as the amount of land and water that is required to produce what is consumed and handle the waste that is generated. It estimates the quantity of renewable and non-renewable resources that our actions require.



I will use information and **INVESTIGATE FURTHER** questions to help me identify a project question I want to investigate for a sustainability **MATTERS** project.

I will identify what I need to know more about.



INVESTIGATE FURTHER

How can an ecological footprint be used to balance food choices?



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footprints can be measured

There are a number of ecological footprint calculators online, among them [footprintcalculator.org](https://www.footprintcalculator.org) and <https://calc.zerofootprint.net/>.

These calculators measure the impact that individuals have on the resources of the planet. They do this by asking questions about daily activities, such as how often people take public transit or drive their cars. They then estimate how many resources are used by their actions.

Although these calculators are quite detailed, the measures used to calculate ecological footprints can also be oversimplified. Considering the many different factors that influence environmental conditions, ecological calculators may over or underestimate human impact. As the use of information technology to monitor environmental conditions becomes more complex, it also becomes harder to accurately measure the carbon footprint of specific products, including food. However, footprint calculators are still useful for understanding the influence of human activities.



INVESTIGATE FURTHER

What are the benefits and limitations of the science that the calculations of ecological footprints are based on?

food has a carbon footprint

How often have you seen calls to reduce food waste or to buy local? These types of statements relate to the perceived carbon footprint connected to these human activities. A carbon footprint is often part of the calculations used to measure an ecological footprint.

A **carbon footprint** is the total greenhouse gas (GHG) emissions that are caused – directly or indirectly – by an individual, organization or product. It is calculated by adding the emissions that result from every stage of the product's lifetime. This includes its production, manufacturing, processing, transportation, use and disposal.

Many different greenhouse gases may be emitted during the lifetime of a product. These gases have varying potential to trap heat in the atmosphere.



INVESTIGATE FURTHER

How does measuring and monitoring carbon footprints support sustainable agriculture?

The calculation of an individual's or organization's carbon footprint involves calculating the carbon footprint of the products or services that they consume.

Food also has a carbon footprint. The emissions created by food production consist mainly of carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (NO₂). These emissions vary depending on what type of food is raised, grown or produced, where is it created and what kind of agricultural or processing practices are used.

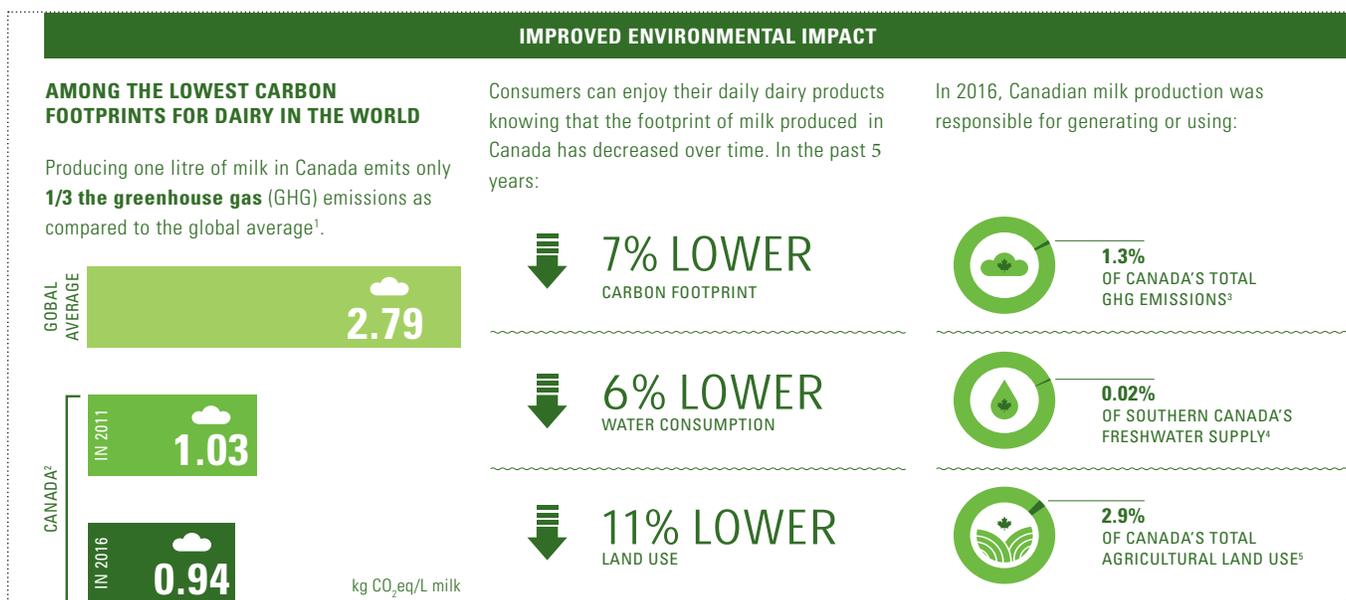
Consider the following points. Which of these would you consider factual? Which represent opinions?

- Food must be grown to feed animals, therefore animal products generally have larger carbon footprints per calorie than grain or vegetable products.
- Switching to less carbon intensive foods can reduce the carbon footprint. However, it's also important to look at the bigger picture – we need to account for the nutritional value of foods as well as their carbon footprint. For example, lettuce may have a lower carbon footprint per kilogram than beef, but beef provides far more nutrients per unit of mass. Furthermore, we need to look at the bigger environmental picture. Factors such as climate, biodiversity, water use, land use and many others should be considered. For example, lettuce may not be able to be grown in certain areas, increasing the footprint of its transportation.



INVESTIGATE FURTHER

How do people monitor environmental conditions? How effective are these practices in promoting sustainability?



Dairy Farmers of Canada: Sustained Progress: Environmental Efficiency of Canadian Milk Production.

Debates about organic and conventional crops suggest there are only two ways to grow food: a *good* way and a *bad* way. But an important question to think about is, “What is the best way to feed a growing population, while reducing the amount of resources required?” To address this, farming will need multiple approaches, not just one.

From BestFoodFacts website. 5 Things You Didn't Know About Farming (2016). www.bestfoodfacts.org/5-things-you-didnt-know-about-farming/ and Are Cows Bad for the Environment? (2019). www.bestfoodfacts.org/are-cows-bad-for-the-environment/

environmental projects monitor agricultural footprints

Farmers and other organizations measure, monitor and make significant improvements to the ecological footprint of the food they produce.

For example, the carbon footprint of chicken production has been reduced by 37 percent and water consumption by 45 percent over the last 40 years.

In another example, the Egg Farmers of Alberta initiated the egg environmental footprint project in 2012, to better understand and quantify the environmental impact of egg production in Alberta, through a **Life Cycle Assessment (LCA)**. A Life Cycle Assessment measures and evaluates the full environmental impact of a product from its creation to its disposal.

The first of its kind in Canada, the study involved collecting data from egg farmers covering the life cycle stages of an egg, from feed production to grading.

UNDERSTANDING THE ENVIRONMENTAL AND NUTRITIONAL PROFILE OF ALBERTA EGGS

As part of our sustainability journey, Egg Farmers of Alberta (EFA) undertook a study to better understand the environmental and nutritional contribution of one serving of eggs in an average daily diet.

UNDERSTANDING OUR FOOTPRINT

With consumers wanting to know more about their food and how it is produced in a sustainable way, EFA initiated the egg environmental footprint project in 2012. The objectives were to better understand and quantify the environmental impact of egg production in Alberta* through life cycle assessment (LCA)—a robust and internationally recognized scientific tool. The first of its kind in Canada, the study involved collecting data from egg farmers covering the life cycle stages of an egg, from feed production to grading.

CRADLE-TO-FARM GATE CARBON FOOTPRINT FOR ONE LARGE EGG

Category	Percentage
Feed production	65%
Farm operations	22%
Washing and grading	5%
Transportation	5%
Hatchery	3%

ALBERTA EGGS AS PART OF YOUR DAILY DIET

NUTRITIONAL CONTRIBUTION*

ONE SERVING OF EGGS PROVIDES A LARGE PERCENTAGE OF MANY IMPORTANT NUTRIENTS

WHILE CONTRIBUTING TO ONLY A SMALL PERCENTAGE OF THE ENVIRONMENTAL FOOTPRINT OF A DAILY DIET

Nutrient	% of Recommended Daily Requirement
Choline, Vitamin B	100%
Vitamin D, E, Folate	30%
Vitamin A	20%
Fat	16%
Iron, Zinc	12%
Calories	7.8%

1 SERVING = 2 EGGS (2 x 53g)
12 g OF PROTEIN

ENVIRONMENTAL CONTRIBUTION*

Metric	Value	% of Daily Diet
Average Carbon Footprint	5.0 kg CO ₂ -eq	7.9%
Average Water Footprint	470 L (total life cycle water consumption)	1.3%

HEALTH CANADA'S RECOMMENDED FOOD GUIDE SERVINGS

- 7-10 SERVINGS (Fruits & Vegetables)
- 6-8 SERVINGS (Grains)
- 2 SERVINGS (Protein)
- 2-3 SERVINGS (Dairy)

Egg Farmers of Alberta

For more information
TOLL FREE 1-877-302-2344
FAX 403-291-9216
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* For more information on the Alberta eggs LCA, the methodology behind the environmental footprint of a daily diet and a complete list of nutrients, go to eggs.ab.ca/environment

INVESTIGATE FURTHER

How does measuring and monitoring carbon footprints support sustainable agriculture?