

Food's footprint



In this activity you will use scientific data to evaluate which of the analysed animal-based options has the lowest carbon footprint in Greenland.

 **Duration:** 90 minutes

Learning outcomes

Scan the QR code



Materials

- Tables to complete the activity (Handout 1)
- Graph (Handout 2)
- Material for writing and drawing

GUARDNA cards

Species Cards

- Bearded seal
- Harp seal
- Hooded seal
- Ringed seal

Stakeholder Cards

- Consumers
- Hunters
- Scientists

Uses Cards

- Food

Threats Cards

- Climate change

Background

The choices we make regarding our food consumption and how they are produced have significant implications for both our health and the **environment**. From growing and processing to transportation, distribution, preparation, consumption, and disposal, each stage of the food's life cycle generates **greenhouse gases**, contributing to climate change. Our **carbon footprint**, this is, the amount of greenhouse gases like **carbon dioxide** and **methane** that are generated by our actions, is heavily influenced by our food-related activities, with approximately one-third of human-caused **greenhouse gas** emissions linked to food production.

The climate impact (this is, the **carbon footprint**) of food can be quantified in terms of its **greenhouse gas** emissions intensity, measured in kilograms of **carbon dioxide** equivalents (kg CO₂e) per kilogram of food (kg of food). Animal-based foods are generally associated with the highest **greenhouse gas** emissions – but do all animal-based food alternatives contribute to the same extent? What are other factors in the food production chain that contribute to **greenhouse gas** emissions?

Preparation

1. Pair the students. This exercise can also be done individually, but we encourage grouping students to encourage discussion.
2. Print Handouts 1 and 2.

Procedure

In this activity, you will calculate the **carbon footprint** of various animal-based food alternatives consumed in Nuuk, Greenland. The alternatives include poultry and pork transported from Denmark by boat or plane, and locally hunted seal (hunted either near or far from the city). You will assess **greenhouse gas** emissions from different phases of production and transportation, from the farm or field to the **consumer**.

Handout 1 contains all the necessary tables to complete the activity and Handout 2 includes a graph for plotting the final results.

Start the activity by calculating the emissions from transporting pork and poultry from Denmark to Greenland by both boat and plane using the data in Tables 1, 2 and 3. The provided data in Table 4 includes **greenhouse gas** emissions from pork and poultry production (farming and the cultivation of food for feeding these animals), and emissions from hunting seals including fuel for the trip and ammunition (data from Ziegler et al., 2021), that students will use to calculate the total **greenhouse gas** emissions from the production and transport of animal-based food alternatives in Greenland. Finally, compare these emissions by plotting the data on a graph.

1. Start by calculating the greenhouse gas emissions from transporting 1 kg of poultry or pork from a farm in Aalborg (Denmark) to the port in Nuuk (Greenland). Use the information in Data Table 1 to complete Table 2. Pay attention to the units!
2. Fill the "Total emissions from transport from Aalborg to Nuuk by boat" in Table 2.
3. Repeat steps 1 and 2, but this time use the Table 3 to calculate the transport of poultry and pork by plane.
4. Copy your results into Table 4 and plot them on a stacked bar chart (Handout 2) for each food alternative. Use different colours to represent each component (production, shipping, fuel, etc.) of the total **greenhouse gas** emissions.

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Follow-up discussion

- What is the animal-based alternative with the lowest **carbon footprint** in Greenland? Do you think the same food alternative will have such a low carbon footprint all over the North Atlantic?
- Why does the shipping of food by boat contribute so little to the **greenhouse gas** emissions? Discuss about the two different ways of transport (boat vs. plane) and what are the differences when it comes to transporting big amounts of food (remember that the emissions are calculated by kg of food!)
- Is **sustainability** only a matter of the carbon footprint? Explore the concepts of **sustainable food systems** and **carbon-tunnel vision**.

Extension

- **Adapt your food choice to where you are.** As you learnt in the activity, transportation by boat makes up only a minor fraction of the **carbon footprint** associated with each animal-based food alternative. While eating local and seasonal foods is generally healthier and more **sustainable**, the type of food you consume has a greater impact on your carbon footprint. Factors such as land and water usage, as well as farming practices, are the have a significant impact in the **carbon footprint**. In continental Europe, eating less red meat and dairy, or opting for alternatives like chicken, pork, or plant-based options, can substantially decrease your footprint. Remember, it is essential to adapt these recommendations to your local context like you just saw in the example!
- **Cut your food waste.** When food is wasted, it is not just the food itself that is lost, but also the energy, land, water, and fertiliser used throughout its production, packaging, and transportation. By minimising waste, you not only save money but also reduce **greenhouse gas** emissions and contribute to conserving **resources** for future generations. Purchase only what you need, avoid letting food expire, and do not hesitate to use those slightly browning bananas sitting in your kitchen.

References

Doll, C., Brauer, C., Köhler, J., & Scholten, P., (2020). Methodology for GHG Efficiency of Transport Modes (Framework Service Contract EEA/ACC/18/001/LOT 1). Fraunhofer ISI 2020. https://cedelft.eu/wp-content/uploads/sites/2/2021/05/CE_Delft_200258_Methodology_GHG_Efficiency_Transport_Modes.pdf

FAO (2018). Sustainable food systems Concept and framework (No. CA2079EN/1/10.18). - Food and Agriculture Organisation of the United Nations. <https://openknowledge.fao.org/server/api/core/bitstreams/b620989c-407b-4caf-a152-f790f55fec71/content>

Ziegler, F., Nilsson, K., Levermann, N., Dorph, M., Lyberth, B., Jessen, A. A., & Desportes, G. (2021). Local Seal or Imported Meat? Sustainability Evaluation of Food Choices in Greenland, Based on Life Cycle Assessment. Foods, 10(6), 1194. <https://doi.org/10.3390/foods10061194>