

Environmental impact of animal protein

Red meat (can be adapted to include white meat too)

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Key learning objectives

Aim: to introduce the environmental impacts of food and the concept of Greenhouse Gas (GHG) emissions and particularly how that relates to animal proteins (meat and dairy)

Learning objectives:

1. Understand the need to rebalance the protein in our diets
2. Introduce strategies and techniques to reduce red meat in recipes and identify optimal portion size when serving red meat
3. Evaluate the sensory characteristics of the modified recipes



Practical task

Concept: Techniques for replacing meat flavour and texture

Dish: Spaghetti Bolognaise

Quick description:

- Activity 1: Different levels of substitution in Spaghetti Bolognaise
- Activity 2: Sensory evaluation



Key things you need to know...



Environmental impact of food

Food production and consumption has significant environmental impacts:

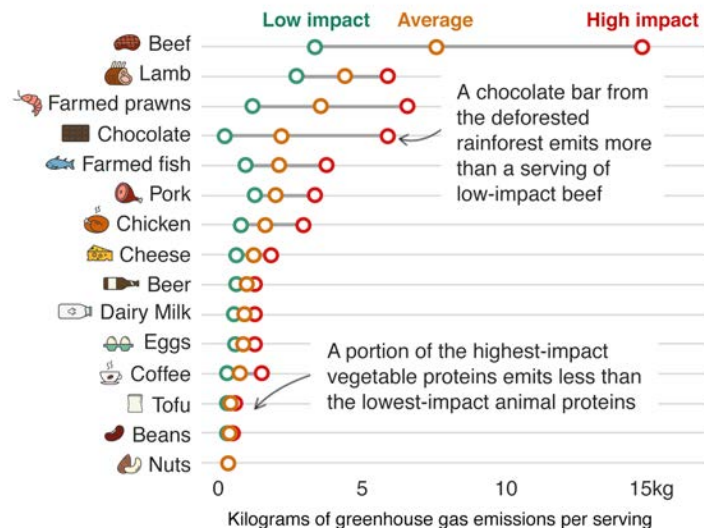
- Food accounts for a quarter of global greenhouse gas emissions
- Two-fifths of land on the planet is used for agriculture
- It accounts for 70% of global freshwater use
- Agriculture causes 78% of the eutrophication pollution of our waterways (damaging aquatic life)



Animal proteins have a particularly high environmental footprint

Beef has the biggest carbon footprint - but the same food can have a range of impacts

Kilograms of greenhouse gas emissions per serving



Meat and dairy products can provide a **rich source of protein** and other nutrients in our diets.

However, these products typically have a **high carbon footprint**, partly due to methane production from animals like cows and sheep.

It is also generally **resource intensive** to rear livestock as you have to grow the crops in the first place to feed them with.

Source: Poore & Nemecek (2018), Science

BBC

Source: Poore & Nemecek (2018), Reducing food's environmental impacts through producers and consumers;

<https://science.sciencemag.org/content/360/6392/987>; image from <https://www.bbc.co.uk/news/science-environment-46459714>

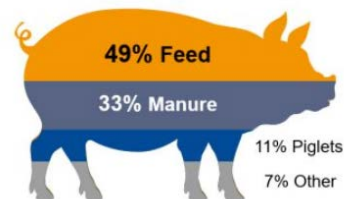


Animal feed, land use and deforestation

One of the biggest sustainability impacts in livestock is **how and what animals are fed**. About **half of the agricultural land** on the planet produces animal feed.

Poultry, pigs and an increasing number of ruminants (cows, sheep etc.) eat **grain-based feeds**, grown in vast monocultures on land that could also grow food directly for humans.

Pork supply chain's contribution to aggregated environmental impact



Soya is one of the significant feed crops and next to South American beef, is one of the **leading drivers of deforestation**



Animal feed, land use and deforestation

Deforestation is not the only crisis, intensive feed crop production uses large amounts of **chemical-inputs, that run-off** and cause damage in our rivers and oceans, driving biodiversity loss.

Today, over **1 million animal and plant species are threatened with extinction**, many within decades.



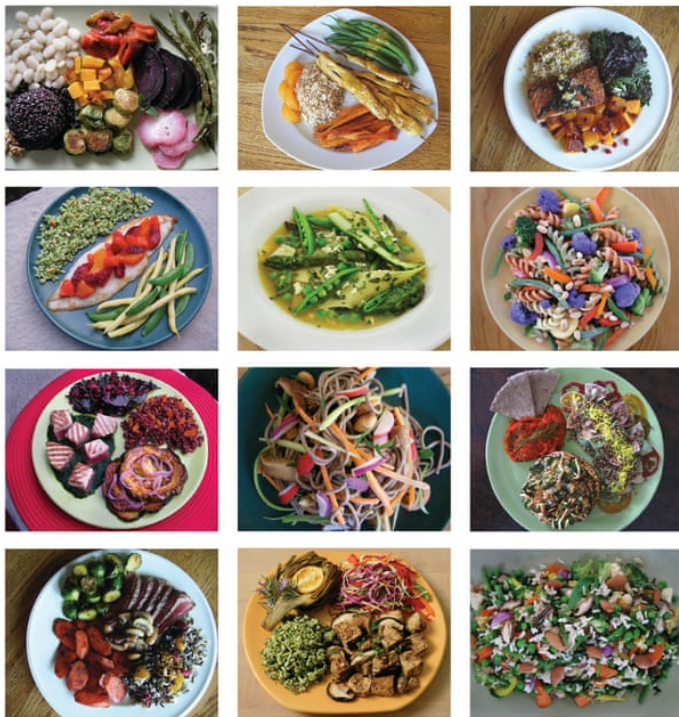
Despite this, **global demand** for animal protein continues to increase.

More land is being **converted for feed-crops** and demand for sustainability-grown soy is limited, with only 1-2% of the world's soy being certified.

For the safeguarding of humanity and wildlife, it's **critical that we shift our diets and grow food using more sustainable practices.**



We need to diversify our diets towards more plants and vegetables



We need to eat **“less and better”**: replacing some of the animal protein we eat with vegetables and plant protein and making sure the meat and dairy we do eat is produced sustainably.

Done well, this can be a varied, nutritious and balanced way to eat.

Suggested video introducing the planetary diet – Euronews report:
<https://www.youtube.com/watch?v=NCQ-MpoTLvM>



The 'Planetary Health Diet' is designed to be healthy for both people and planet

The EAT-Lancet Commission explored what a **balanced diet** would look like that could deliver **good nutrition** for a population of nearly 10 billion people **within planetary boundaries**.

By volume, a planetary health plate is about **half a plate of vegetables and fruits**, with **whole grains, plant proteins and unsaturated plant oils** contributing the majority of the remaining calories.



The planetary diet is flexible and recommends intake levels of various food groups that can adapted to local geography, culinary traditions and personal preferences



Tips for chefs...



Experiment with rebalancing the protein in your dishes

Even in existing nutritional guidelines, the recommended daily portions of meat range from 70-130 grams -- in general we are eating far more than we need.

- Let plants take centre stage in your dishes, explore new foods and feature **more flexitarian or semi-vegetarian dishes on the menu.**
- There are many creative opportunities to not only increase but also **experiment and improve the vegetables and plant protein offers** on your menu. Particularly by using inspiration from traditional, plant-forward food cultures, such as South Indian.
- **Create rebalanced dishes** by blending meat with vegetables and plant proteins, or other meat replacements. In some dishes, such as curries and stews, this would hardly be noticed.



Explore different flavours and textures

- Work with different techniques to harness the potential of **umami flavours**.
- Use spices to **enhance the natural flavour** profile of your vegetables and plants. For example bang bang cauliflower
- **Work with textures** to help make your vegetables and plants more interesting.
- **Try various cooking techniques** such as BBQ, grilled or cooked over a fire, smoked, roasted, steamed, poached, pureed etc.



Choose 'better' meat that supports sustainability

For example, pasture fed grazing animals (such as sheep and cows) can be part of supporting biodiversity and good soil health, if managed well.

This also reduces the competition for land to grow feed that could otherwise be used to grow crops for direct human consumption.



The **Pasture for Life** mark certifies that meat and dairy products have come from animals raised only on grass and pasture.

You will learn about other important aspects of choosing 'better' meat in other modules of this course.



Bring your customers along with you

EAT Forum has some helpful advice:

- **Emphasize the benefits of dietary shifts:** what new exciting things are they getting to try, rather than what they are losing out on.
- **Lead with messaging around flavour:** how can you make the healthiest and most sustainable options the tastiest and most appealing?
- **Share the farmer's story:** helping people to connect with where their food has come from is critical for emphasising the value of protecting the environment and livelihoods



Check out [WRI's Playbook](https://wri.org/publications/2019/01/eat-brief-food-service-professionals) for more ideas



Summary: key takeaways

Key things you need to know:

- Food production and consumption has a significant environmental impact
- Animal proteins have a particularly high environmental footprint
- Red meat has a high carbon footprint but other meat and dairy products are also resource intensive to produce
- We all need to eat “less and better” animal protein, while increasing our consumption of plants

Tips for chefs:

- Put more flexitarian or semi-vegetarian dishes on the menu
- Experiment and improve the vegetable and plant protein offers on your menus, taking inspiration from other food cultures
- Create rebalanced dishes with less meat by blending meat with vegetables
- Explore ways to enhance flavours when using more vegetables
- Choose better meat that supports sustainability
- Bring your customers with you on the journey

