Food and Sustainability

Poole Grammar School

May 2023

Theo Kuehn

Key Lessons

Poole Grammar School

The current way we produce food, and use food, is unsustainable.

What matters now is changing our actions and habits…

With food it's simple!
Make good decisions, and limit waste.

You have more power than you know!

Quick Quiz

Poole Grammar School

What percentage of (human caused) **global greenhouse gas emissions** are a result of food production?

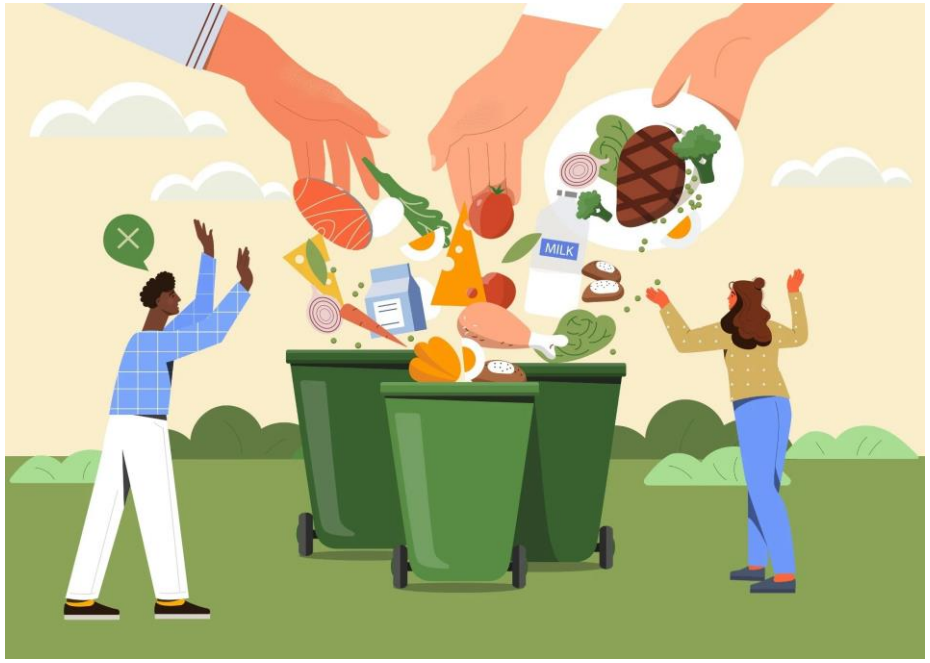
Quick Quiz

Poole Grammar School

30%

Quick Quiz

Poole Grammar School



What percentage of food produced globally is **never eaten**?

Quick Quiz

Poole Grammar School

33%

Quick Quiz

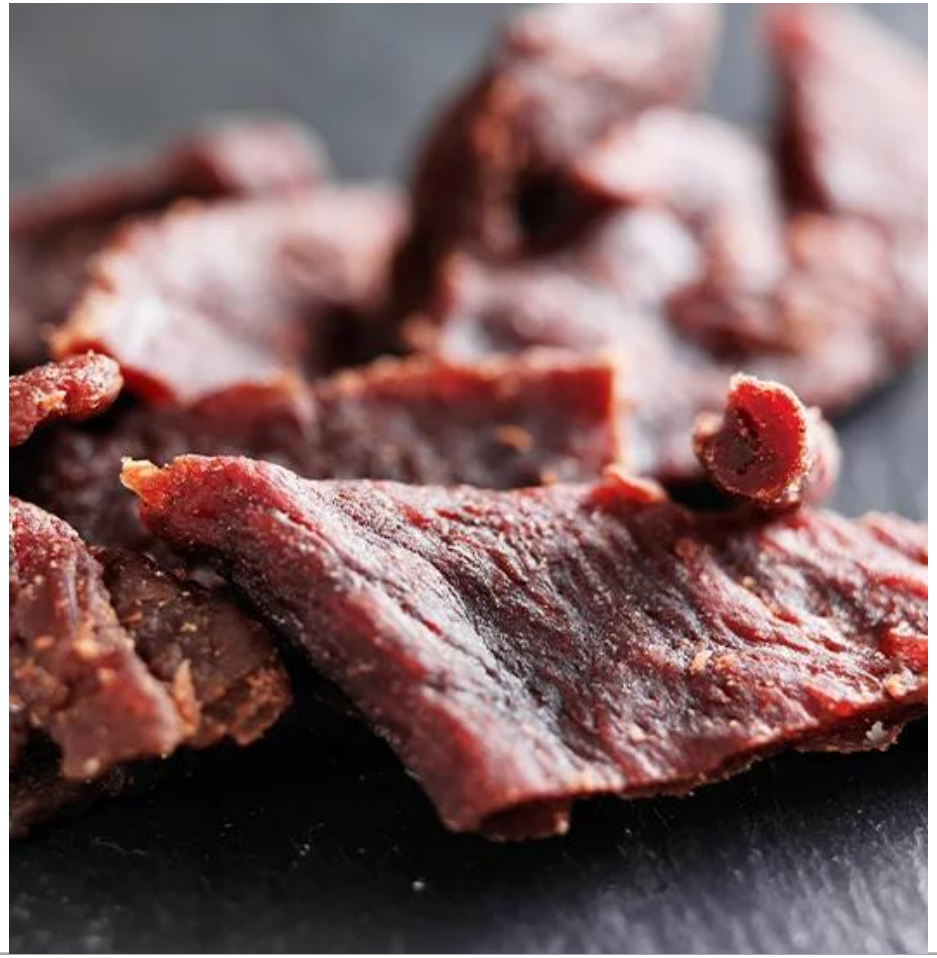
Per KG produced,

what is the **most**

carbon intensive

food?

Quick Quiz



Beef Jerky

What *is* Sustainability?

Poole Grammar School

Sustainability:

Meeting the needs of the present without compromising the future.

The Greenhouse Gases

Poole Grammar School

Carbon Dioxide (CO_2) has a GWP of 1:

It remains in the atmosphere for 1,000+ years

Methane (CH_4) = x28:

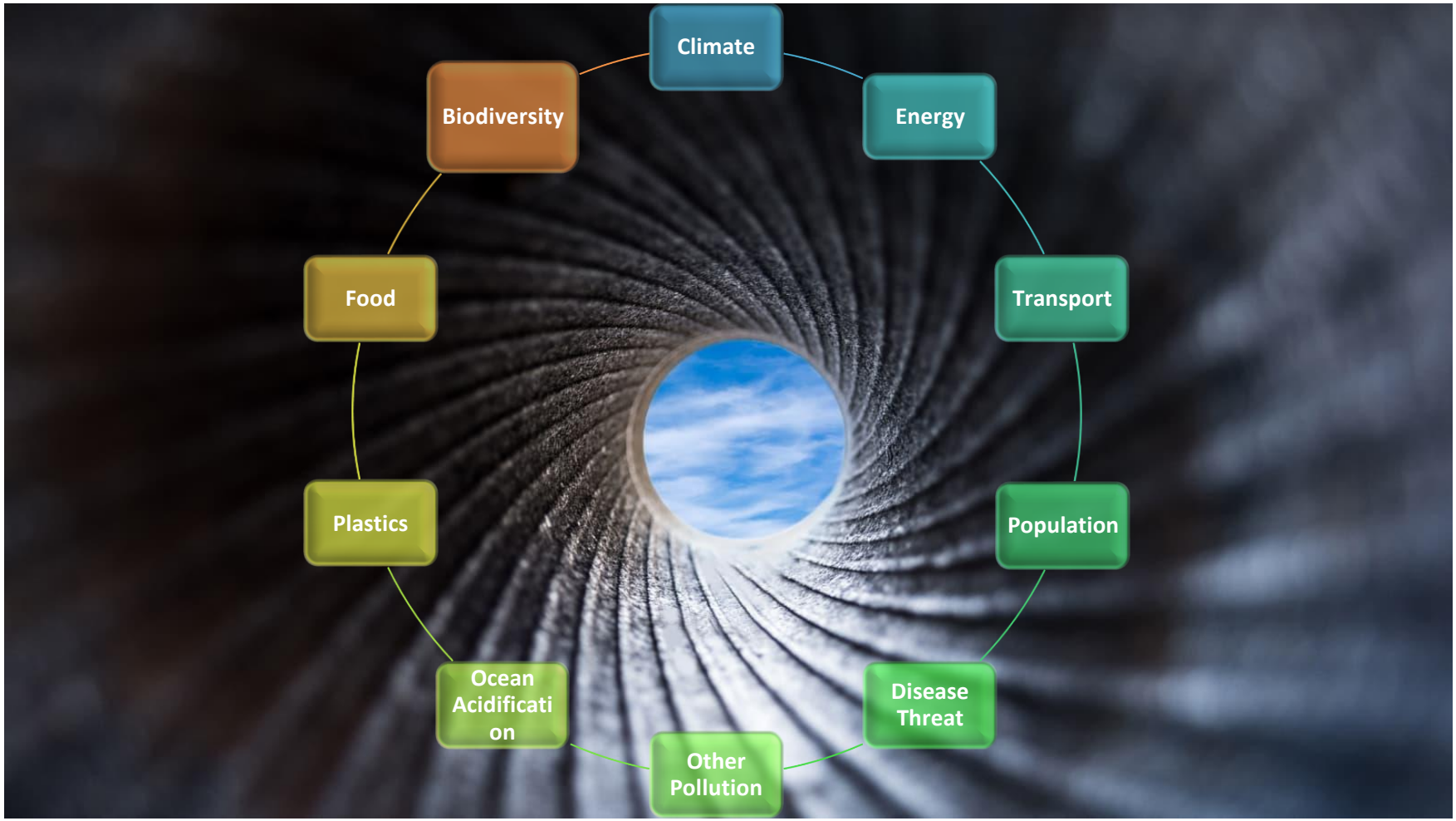
It remains in the atmosphere for circa 10 years

Nitrous Oxide (N_2O) = x265:

It remains in the atmosphere for 100 years+

It’s not just Carbon

Poole Grammar School



What are the impacts?

In the past 50 years...

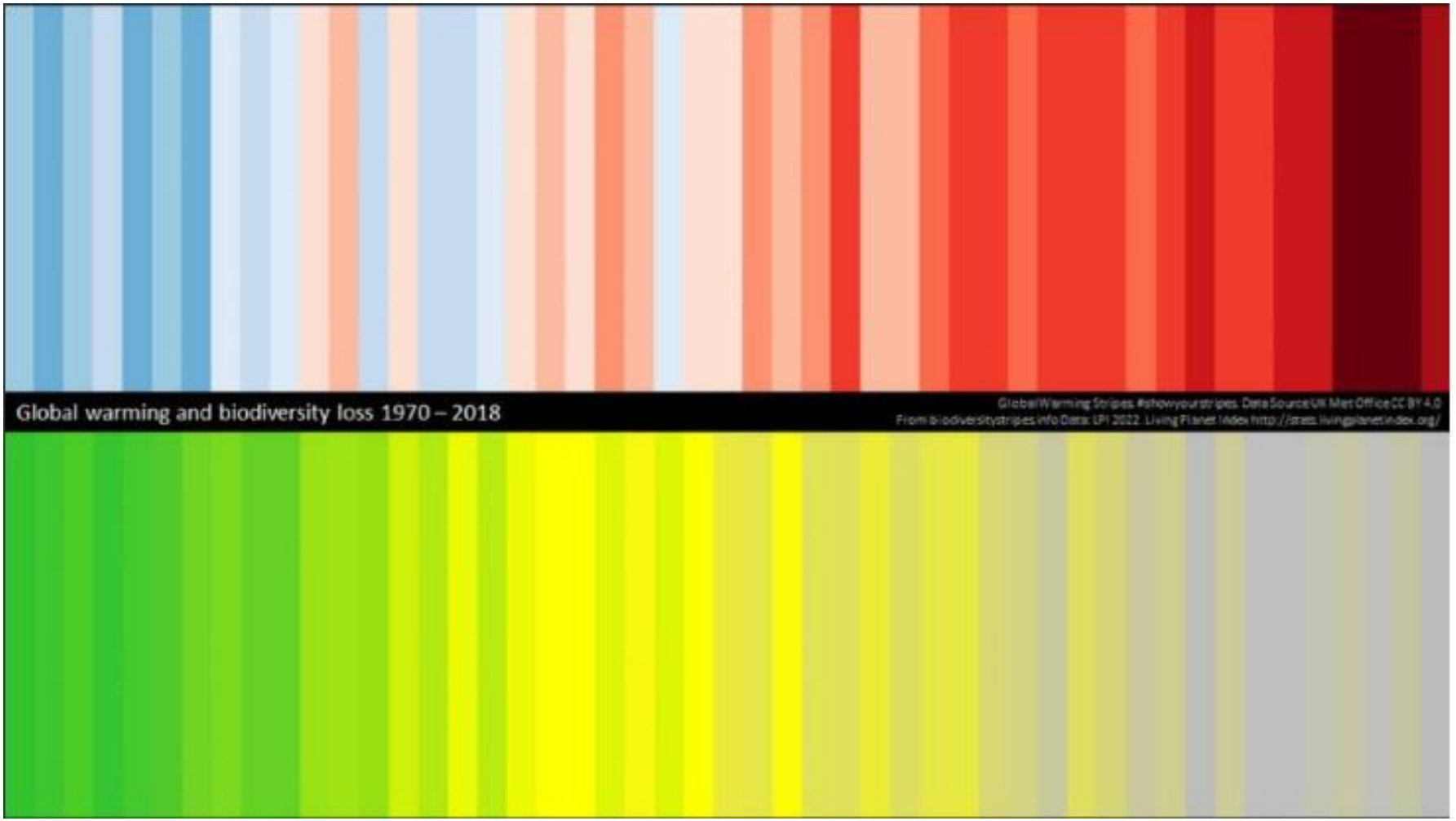
- Human population has doubled
- Global economy has grown nearly fourfold
- Global trade has grown tenfold

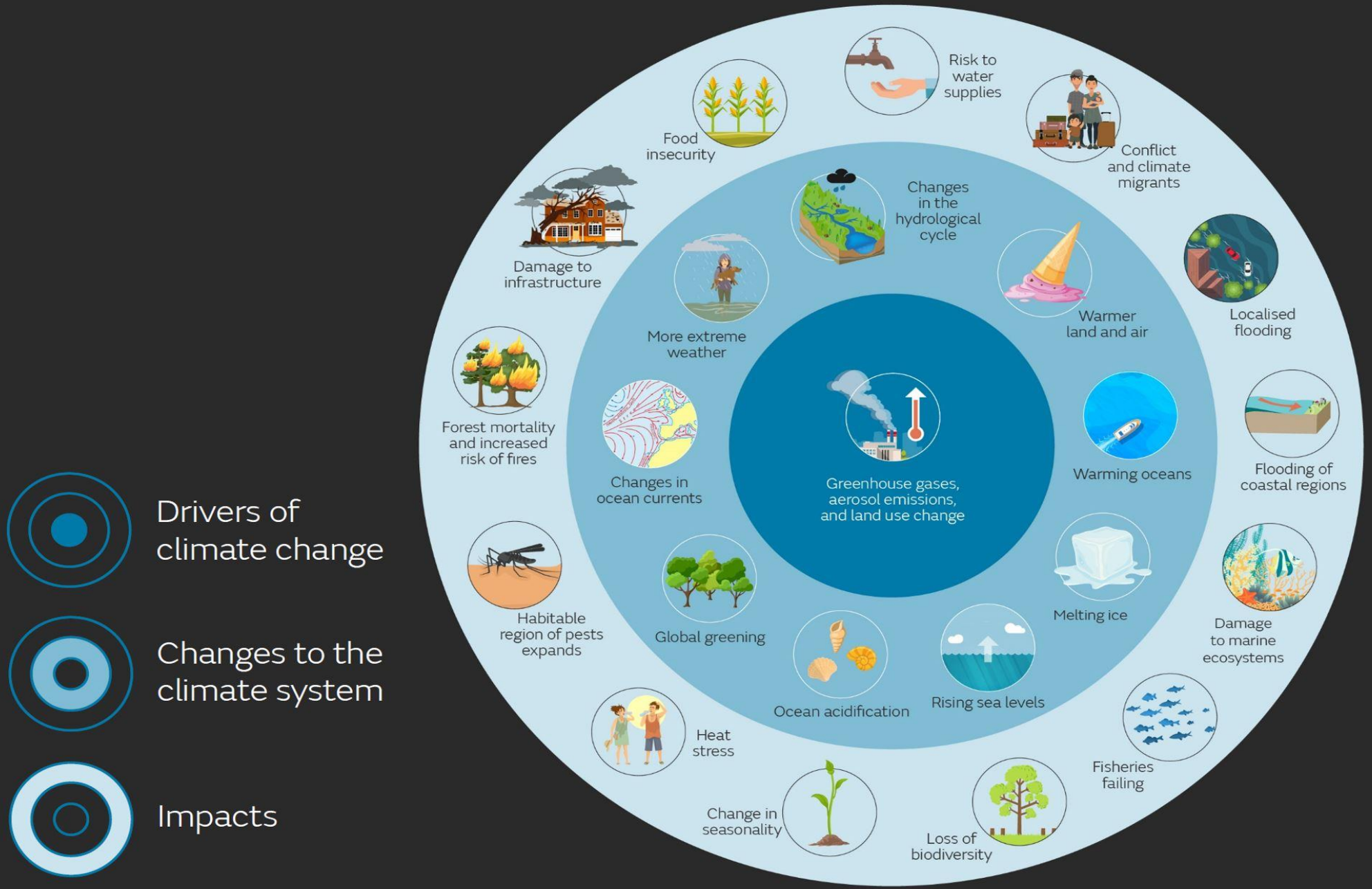
Bringing about **unsustainable demand...**

whilst the Earth's resources are fixed.

The impacts of our current systems.

Poole Grammar School




Drivers of climate change
Changes to the climate system
Impacts
Risk to water supplies
Food insecurity
Conflict and climate migrants
Changes in the hydrological cycle
Damage to infrastructure
More extreme weather
Warmer land and air
Localised flooding
Forest mortality and increased risk of fires
Changes in ocean currents
Greenhouse gases, aerosol emissions, and land use change
Warming oceans
Flooding of coastal regions
Habitable region of pests expands
Global greening
Melting ice
Damage to marine ecosystems
Ocean acidification
Rising sea levels
Heat stress
Fisheries failing
Change in seasonality
Loss of biodiversity

Unsustainable food systems

Poole Grammar School

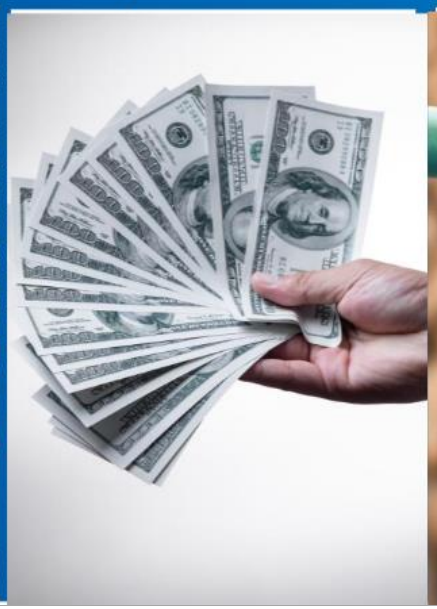
- 70% global fresh water
- 75% of deforestation & biodiversity loss
- 24% vegetated land - soil degradation
- 30% greenhouse gas emissions
- Main source of nitrate and other pollution
- Most fisheries over-exploited
- 77% agricultural land meat and dairy…
- …only produces 18% global calories

Within the next two decades

5 increasing challenges will pressure the global food system

Growing & demographically changing population

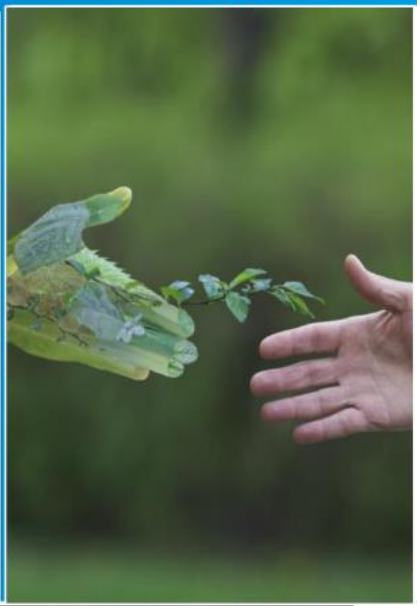
Average increases in purchasing power



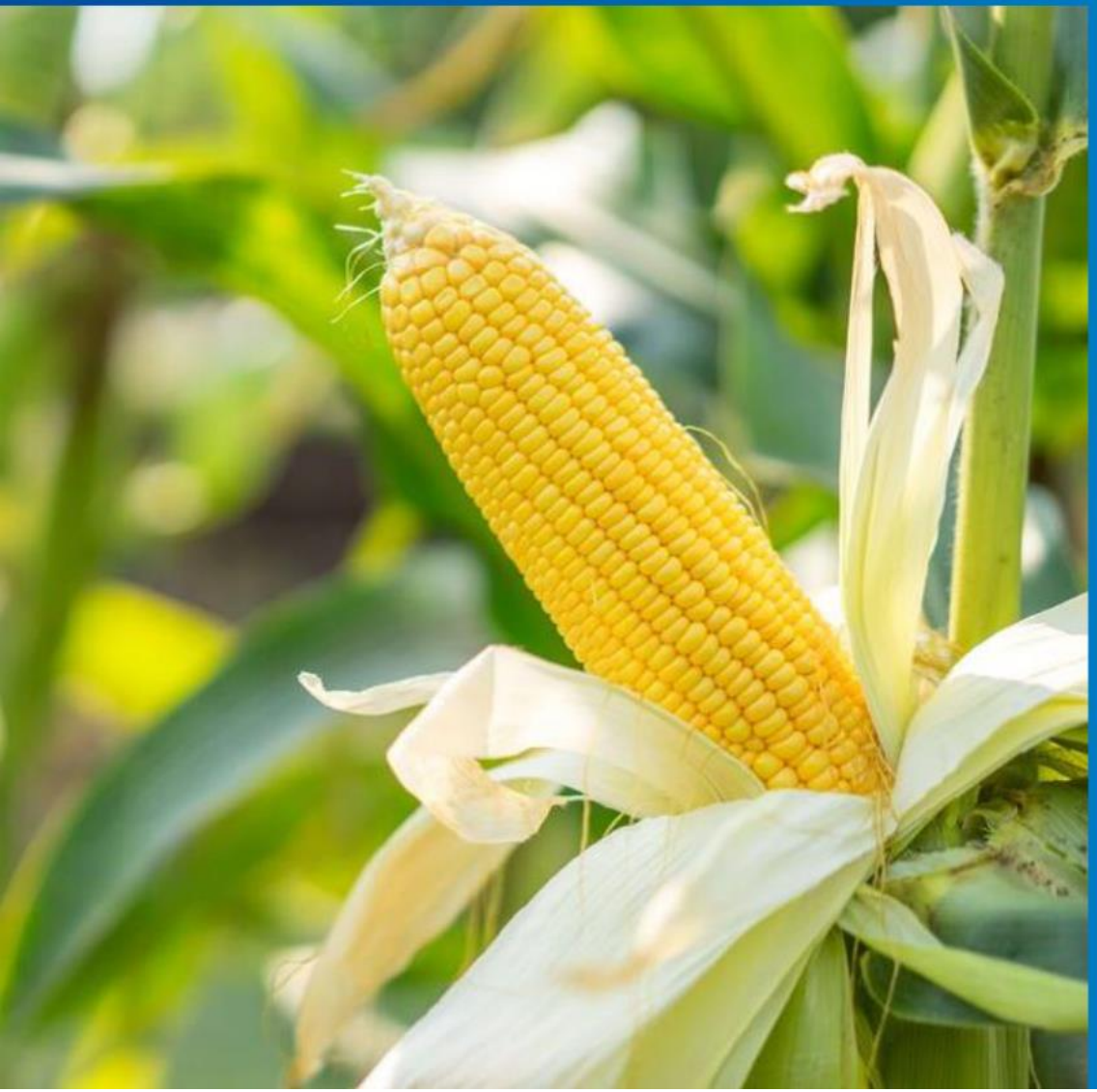
Resource Scarcity

Environmental Change

Mitigating Climate Change



Demographic population change implications for 2.4 billion additional middle-class people



The world will need to produce more food between now and 2050 than the previous 10,000 years **combined**.

What's being done?

UN Sustainable Development Goals

Poole Grammar School

Adoption of Technology

Poole Grammar School

Delivering sustainable value: because good food shouldn't cost the Earth

allmanhall
source • supply • support • success

What can we do?

Carbon emissions during food supply.

Poole Grammar School

Value chain	Ingredients	Packaging	Manufacturing	Warehouse & Distribution	Clients & Consumers
Share of sector emissions	66%	3%	6%	5%	20%
Supply chain transparency					
Education and engagement					

Food: greenhouse gas emissions across the supply chain

Our World in Data

Transport emissions are very small for most food products

Beef (beef herd) 60
Lamb & Mutton 24
Cheese 21
Beef (dairy herd) 21
Chocolate 19
Coffee 17
Prawns (farmed) 12
Palm Oil 8
Pig Meat 7
Poultry Meat 6
Olive Oil 6
Fish (farmed) 5
Eggs 4.5
Rice 4
Fish (wild catch) 3
Milk 3
Cane Sugar 3
Groundnuts 2.5
Wheat & Rye 1.4
Tomatoes 1.4
Maize (Corn) 1.0
Cassava 1.0
Soymilk 0.9
Peas 0.9
Bananas 0.7
Root Vegetables 0.4
Apples 0.4
Citrus Fruit 0.3
Nuts 0.3

Methane production from cows, and land conversion for grazing and animal feed means beef from dedicated beef herds has a very high carbon footprint.

Dairy co-products means beef from dairy herds has a lower carbon footprint than dedicated beef herds.

Pigs and poultry are non-ruminant livestock so do not produce methane. They have significantly lower emissions than beef and lamb.

Flooded rice produces methane, which dominates on-farm emissions.

Farm' emissions for wild fish refers to fuel used by fishing vessels.

Methane production from cows means dairy milk has significantly higher emissions than plant-based milks.

CO_2 emissions from most plant-based products are as much as 10-50 times lower than most animal-based products.

Factors such as transport distance, retail, packaging, or specific farm methods are often small compared to importance of food type.

Nuts have a negative land use change figure because nut trees are currently replacing croplands: carbon is stored in the trees.

0 5 10 15 20 25 30 35 40 45 50 55 60

Greenhouse gas emissions per kilogram of food product
(kg CO_2-equivalents per kg product)

Note: Greenhouse gas emissions are given as global average values based on data across 38,700 commercially viable farms in 119 countries.
Data source: Poore and Nemecek (2018). Reducing food's environmental impacts through producers and consumers. Science. Images sourced from the Noun Project.

Recipes / Roast Lamb & Glazed Carrots

Roast Lamb & Glazed Carrots

Ask a Question | Edit Recipe

Summary

15.26
kg CO_2e per serving

25.21
kg CO_2e per kg

which is equivalent to **1946.2** smartphone charges per serving

Carbon Rating

25.21
kg CO_2e / kg

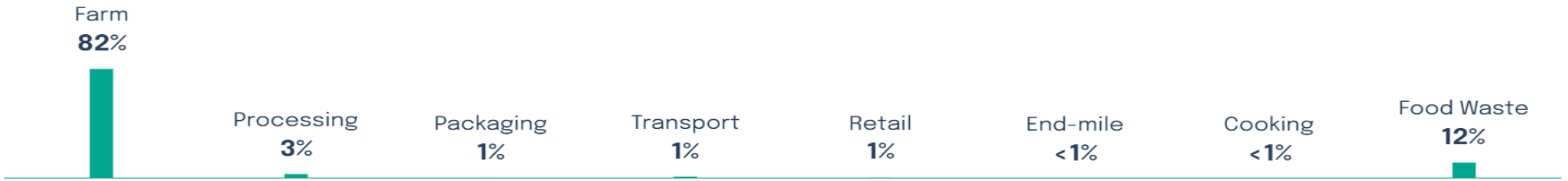
E - Very High

9.24
D - High

Carbon Label

Export

Emissions from each life cycle stage



Recipes / Roasted Curry Cauliflower

Roasted Curry Cauliflower

Ask a Question | Edit Recipe

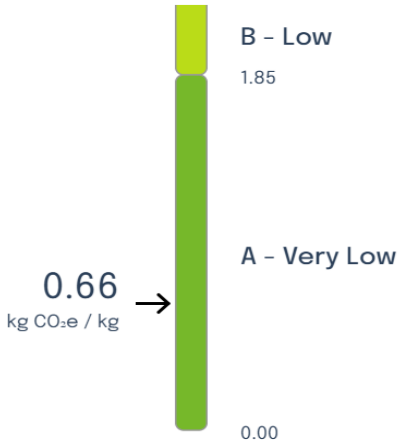
Summary

0.08
kg CO_2e per serving

0.66
kg CO_2e per kg

which is equivalent to **9.7** smartphone charges per serving

Carbon Rating



Carbon Label

Export

Emissions from each life cycle stage

Waste Reduction

Poole Grammar School

1kg of food waste is equivalent to throwing away 3kg of Co2e.

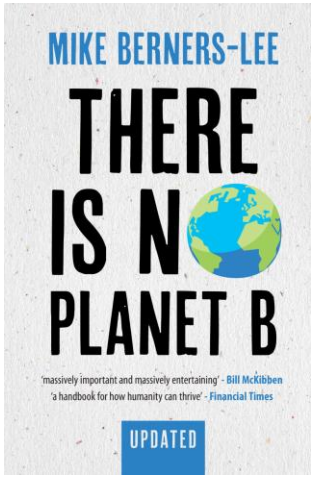
Make sure you limit food waste wherever possible:

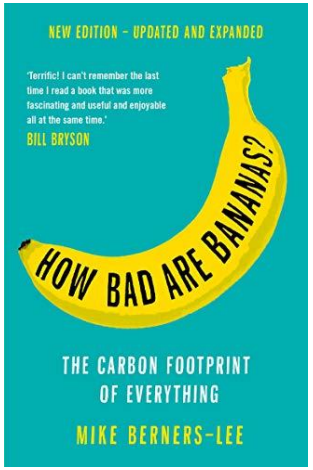
Only take what you need.

How can I learn more?

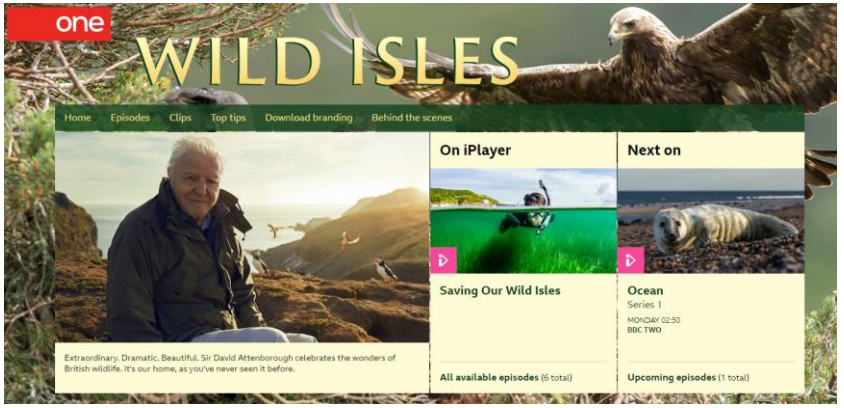
Poole Grammar School

Good Books:





Good Documentaries:



Carbon Footprint Tracker

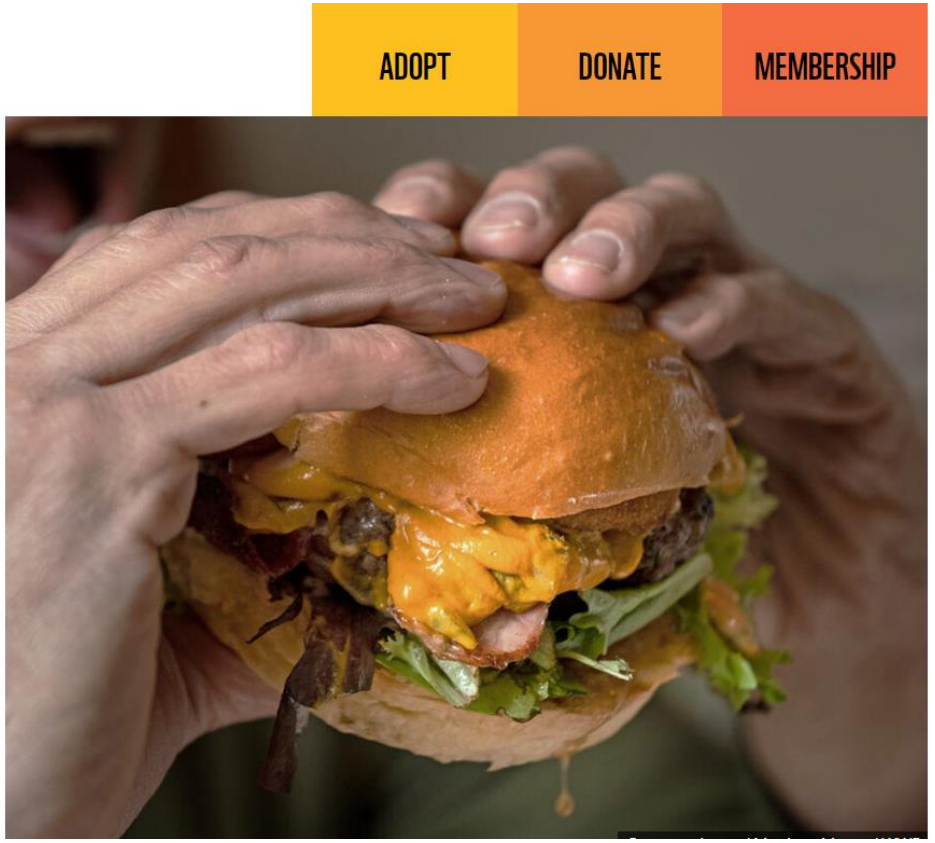
Poole Grammar School

WWF | FOOTPRINT CALCULATOR

HOW BIG IS YOUR ENVIRONMENTAL FOOTPRINT?

Our world is in crisis - from climate change to the pollution in our oceans and devastation of our forests. It's up to all of us to fix it. Take your first step with our UK based environmental footprint calculator.

TAKE THE QUESTIONNAIRE



In conclusion…

Poole Grammar School

- Education is key!
- Avoid waste
- Make good food choices

Thank you

Questions?