

5



Action 5

Rethink diets

*This Action is one of eight in the report, “**Together We Can: 8 Habit changes for below 2°C**”, where all references and the disclaimer can be found. We recommend you read the full report to see how you can make a bigger impact.*

SAY NO TO CARS

FLY LESS

WATCH ELECTRICITY BILLS

CHANGE ONLINE HABITS

RETHINK DIETS

CUT FOOD WASTE

TWEAK ONLINE SHOPPING

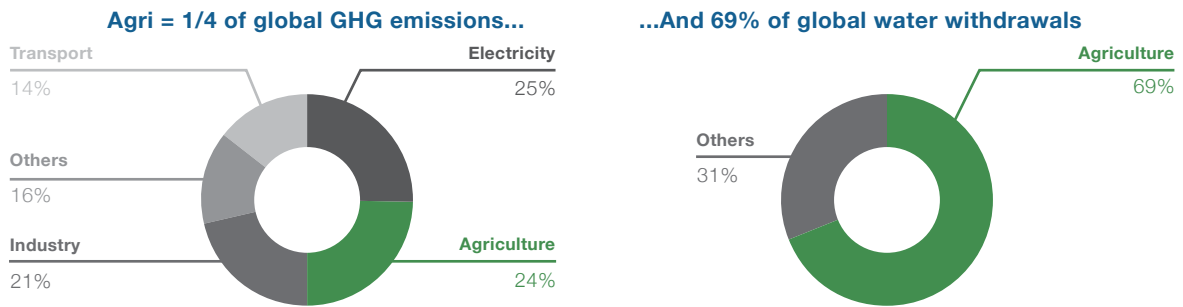
SLOW DOWN FAST FASHION

Action 5: Rethink diets

Why we chose this...

- Agriculture, land use and forestry account for a quarter of GHG emissions. And agriculture is the top water user in most countries, accounting for 69% of water withdrawals worldwide.^{140, 141} Any action to rethink diets could result in huge savings.

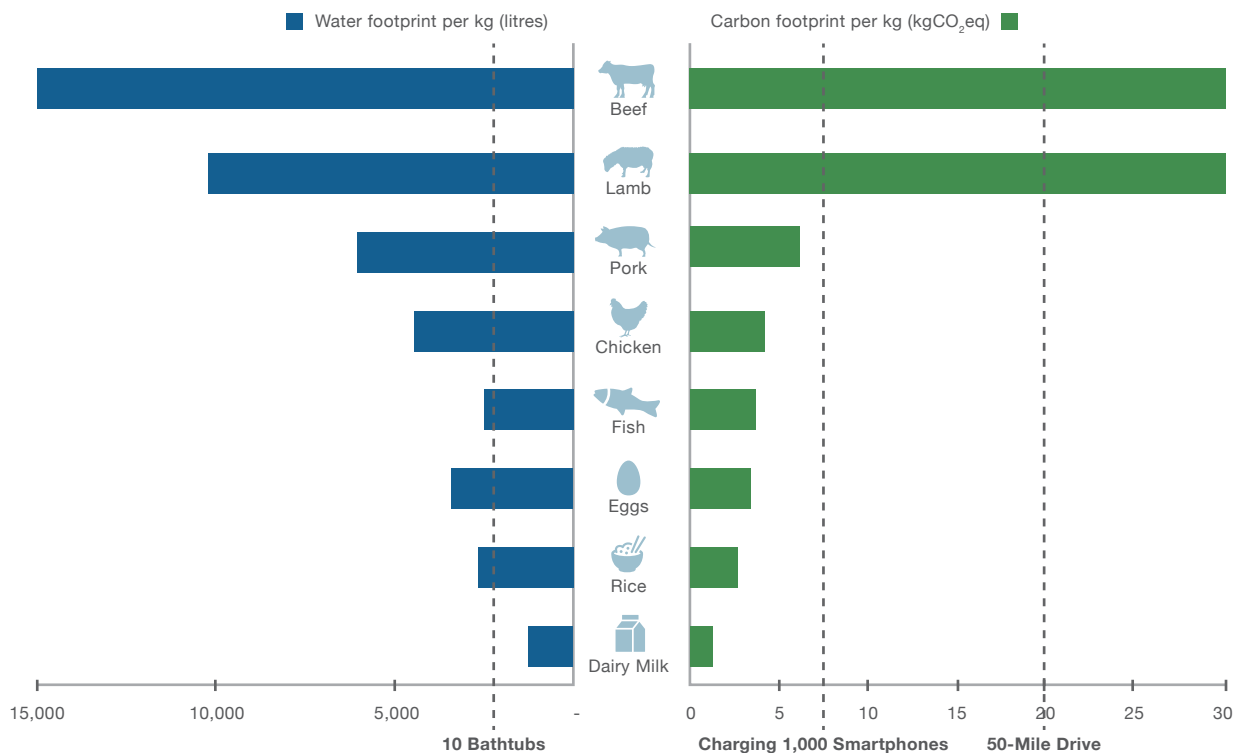
 **CWR** THE CLIMATE & WATER IMPACT OF THE AGRICULTURAL SECTOR



Source: IPCC AR5 report (2014), WRI report "Creating A Sustainable Food Future" (2018), UNFAO AQUASTAT
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- Producing food is carbon and water intensive, as seen in the charts above. As the chart below shows, the most carbon-intensive fresh foods are beef and lamb, mainly because of the methane gas they produce (mostly through burping and farting). Beef and lamb are also the most water-intensive foods. Among animals in the chart, fish have the lowest carbon footprint and farmed fish have the smallest footprint in terms of water.

 **CWR** THE CARBON & WATERFOOTPRINTS OF OUR FREASH FOODS



Source: CWR, Water Footprint Network, Verghese & Clune in "How to reduce your kitchen's impact on global warming" in *The Conversation* (Dec 2016), US EPA
*Refers to all fish species for carbon footprint; refers to farmed fish for water footprint

1 bathtub = 200L

NOTE: carbon footprint includes GHG content from farm production through to regional distribution centres

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- With 3 billion more mouths to feed by 2050, emissions and water use will keep growing unless people rethink their diets.

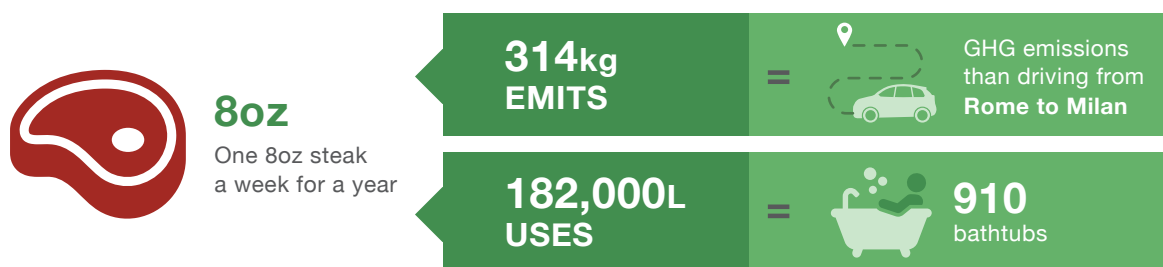
New eating habits...

If cutting meat out entirely, going vegan and eating only local foods is too drastic, consuming less meat can still make a difference, especially when it is locally sourced. Here, we look at two actions that can have a big climate impact. We have chosen these because there is sufficient existing research on their impacts, and we believe they are relatively achievable.

1. Eat one less 8 oz (220 gram) steak a week for a year

Eating an 8 oz steak less once a week for a year produces 314 kg of carbon dioxide equivalent, comparable to driving a passenger car from London to Milan (about 1,250 km).¹⁴² The same steak would need 182,000 litres of water to produce, equivalent to more than 910 bathtubs.¹⁴³

 **CWR** THE SIZEABLE GHG EMISSIONS & WATER CONSUMPTION BEHIND OUR STEAKS

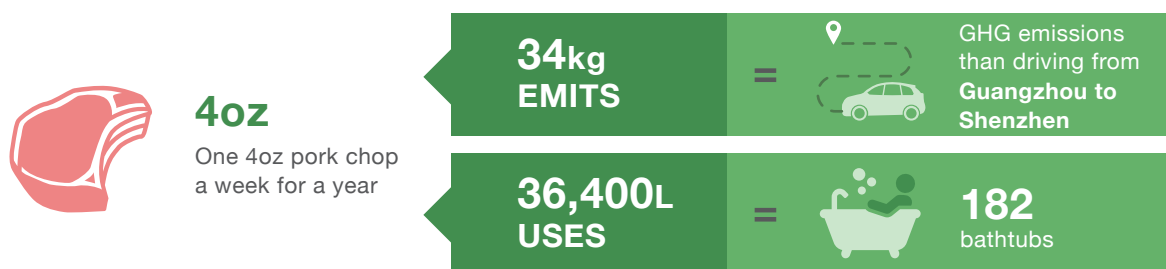


Source: CWR, Verghese & Clune in "How to reduce your kitchen's impact on global warming" in *The Conversation* (Dec 2016), US EPA, US National Health and Nutrition Examination Surveys, Water Footprint Network
 NOTE: assumes 1 bathtub = 200L
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2. Eat one less 4 oz (110 gram) serving of pork a week for a year

A 4 oz pork chop accounts for 0.7 kg CO₂e. Cutting one portion a week for a year could save as much as 34 kgCO₂e, equivalent to driving a car from Guangzhou to Shenzhen (about 140 km) and saving 182 bathtubs of water.¹⁴²

 **CWR** THE GHG EMISSIONS & WATER CONSUMPTION BEHIND OUR PORK

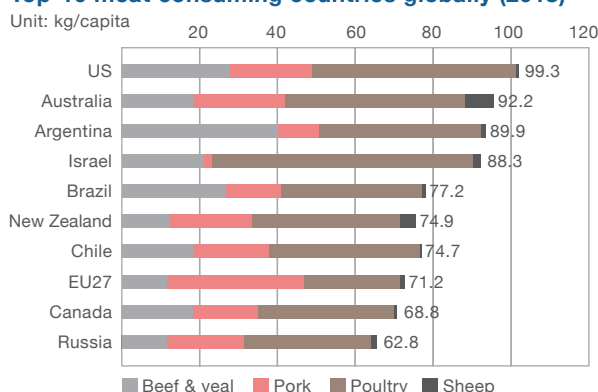


Source: CWR, Verghese & Clune in "How to reduce your kitchen's impact on global warming" in *The Conversation* (Dec 2016), US EPA, US National Health and Nutrition Examination Surveys, Water Footprint Network
 NOTE: assumes 1 bathtub = 200L
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Taking these two actions can help save up to 0.35 tonnes of emissions and 182 bathtubs of water. Together, we can achieve sizable cuts in emissions equivalent to the combined GHG emissions of Hong Kong, Denmark and Singapore if more people took these two actions. Other actions – from going flexitarian to rethinking chocolate – are set out in '5 ways you can do' more below.

Together we can... cut up to 158 Mt of GHG emissions...

Top-10 meat consuming countries globally (2018)



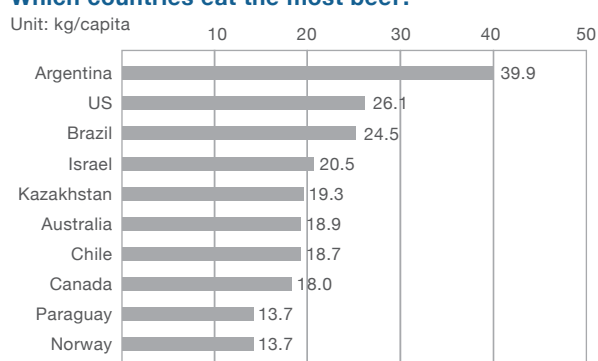
Source: CWR, OECD (2020), Meat consumption (indicator).
doi: 10.1787/fa290fd0-en (Accessed on 12 January 2020)

Some nations eat more meat than others. OECD data for 2018 (see left) shows that Americans eat the most meat (about 99 kg per capita a year) followed by Australians (92 kg), Argentinians (90 kg), Israelis (88 kg) and Brazilians (77 kg). Chicken generally dominates among the Top Ten meat consumers followed by beef and pork.

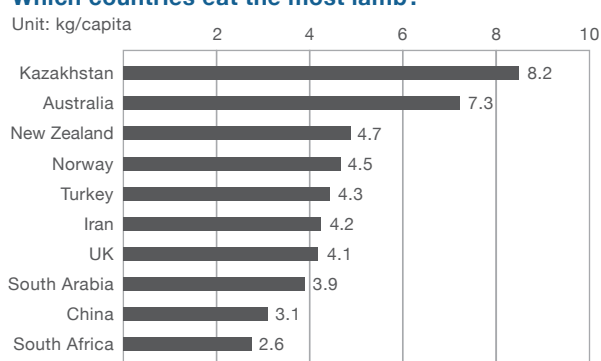
Note that China is not among the Top 10 despite a growing appetite for meat. Chinese eat about 48 kg per capita a year, ranking 22nd. See Rising meat 'consumption in Asia' below.

At almost 40 kg per capita a year, Argentinians are the biggest consumers of beef – the most carbon and water intensive meat – followed by Americans (26 kg) and Brazilians (25 kg). Global consumption is much lower for lamb, also very carbon intensive. Kazakhs eat the most (8 kg) followed by Australians (7 kg). For other meats, Europeans are the biggest consumers of pork (almost 36 kg a year) followed by Chinese and South Koreans (both around 30 kg). Israelis eat the most chicken (65 kg) followed by Americans (50 kg) and Malaysians (49 kg).

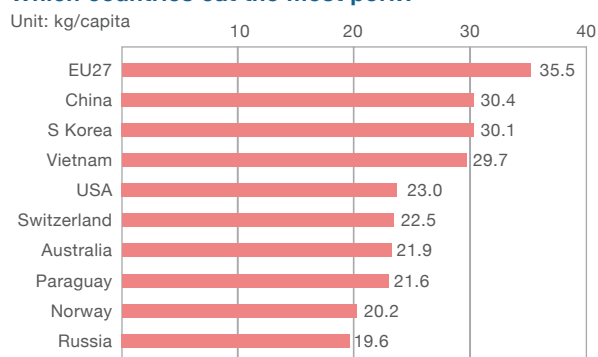
Which countries eat the most beef?



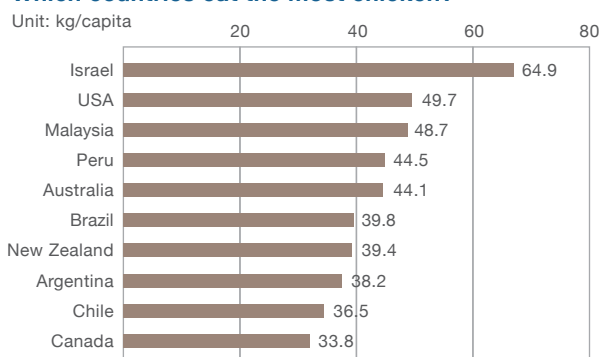
Which countries eat the most lamb?



Which countries eat the most pork?



Which countries eat the most chicken?



Source: CWR, OECD (2020), Meat consumption (indicator). doi: 10.1787/fa290fd0-en (Accessed on 12 January 2020)

We estimate that changes to the habits of willing individuals from Argentina, the US and Brazil (the Top Three beef consumers) plus the EU, China and South Korea (the Top Three consumers of pork) could save almost 158 million tonnes of MtCO₂e, equivalent to the combined GHG emissions of Hong Kong, Denmark and Singapore in 2015.¹⁵

1. Eat one less 8 oz (220 gram) steak a week for a year

According to various surveys, 60% of Argentinians are considering giving up beef and going vegan and 68% of Americans are already reducing or intending to reduce red meat intake to combat climate change. For Brazilians, 29% are moving toward cutting consumption of animal products or are already vegetarian.^{100, 144, 145}

Based on these surveys, we estimate that 27 million Argentinians could save more than 8 MtCO₂e a year while 222 million American could save 70 MtCO₂e and 70 million Brazilians could save 19 MtCO₂e. Together, these people could save almost 98 MtCO₂e, equivalent to the combined emissions of Hong Kong and Denmark in 2015.¹⁵

 **CWR** INDIVIDUALS FROM ARGENTINA, US & BRAZIL CAN SAVE THE COMBINED GHG EMISSIONS OF HONG KONG & DENMARK BY EATING LESS BEEF



Source: CWR, Verghese & Clune in "How to reduce your kitchen's impact on global warming" in *The Conversation* (Dec 2016), Worldometer population statistics, EDGAR emissions database, OECD (2020), Meat consumption (indicator). doi: 10.1787/ta290fd0-en; EIB Climate Survey (2019), Argentina Institute for the Promotion of Beef survey (2019), Good Food Institute survey (2019)

* Assumes an 8oz steak with CO₂ emissions of 26.6kg/kg

** These three countries chosen as they are the top beef eaters in 2018; 60% of Argentinians surveyed considering giving up beef and going vegan; 68% surveyed in the US intending to reduce red meat intake to combat climate change; 29% surveyed in Brazil moving toward reducing their consumption of animal products or are already vegetarian

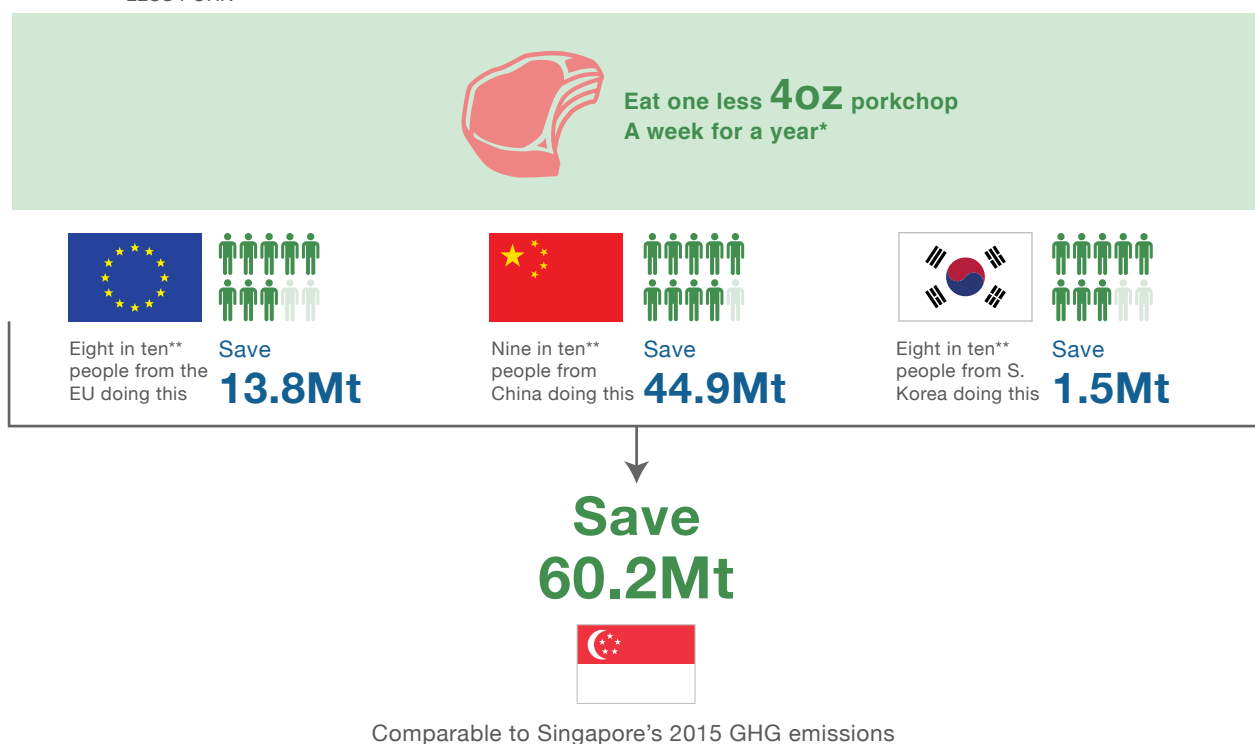
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2. Eat one less 4 oz (110 gram) serving of pork a week for a year

According to the EIB, 79% of Europeans and 92% of Chinese are already reducing or intending to reduce red meat intake to combat climate change. We assume that a willingness to cut consumption of red meat applies to pork as well. In the absence of data for South Korea, we applied the average of the EU and China to estimate a collective reduction.¹⁰⁰

We estimate that eight in ten Europeans eating one less 4 oz pork chop a week for a year would save almost 14 MtCO₂e while the same action by nine in ten Chinese would save almost 45 MtCO₂e. For eight in ten Koreans, savings were estimated at more than 1.5 MtCO₂e. Together, these people from the EU, China and South Korea could save more than 60 MtCO₂e, equivalent to the GHG emissions of Singapore in 2015.¹⁵

 **CWR** INDIVIDUALS FROM THE EU, CHINA & SOUTH KOREA CAN SAVE THE GHG EMISSIONS OF SINGAPORE BY EATING LESS PORK



Source: CWR, Verghese & Clune in "How to reduce your kitchen's impact on global warming" in *The Conversation* (Dec 2016), Worldometer population statistics, EDGAR emissions database, OECD (2020), Meat consumption (indicator). doi: 10.1787/fa290fd0-en; EIB Climate Survey (2019),

* Assumes a 4z pork chop with CO₂ emissions of 5.8kg/kg

** These three countries chosen as they are the top pork eaters in 2018; 79% of the EU surveyed intended to reduce red meat intake to combat climate change; this percentage was 92% in China; we assume that willingness to reduce red meat intake applies to pork as well; as there was no such survey found for S Korea we had to take the average of the EU and China shares to estimate a collective cut

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Ramping up to 5.5 billion tonnes if everyone cuts beef/ lamb by 30%

According to the World Resources Institute, all people worldwide shifting 30% of their expected consumption of ruminant meats from cattle and sheep to plant-based proteins by 2050 could cut GHG emissions by 5.5 gigatonnes (billion tonnes) of carbon dioxide equivalent.¹⁶¹ That's comparable to the combined emissions of the EU and Japan in 2015.¹⁵

Rising meat consumption in Asia

As people from Asia become more affluent, their appetite for meat is growing. Could diets from Asia soon mirror those from the West? What would this mean for GHG emissions?

In East and Southeast Asia, income per capita is expected to grow by between 60% and 100% between 2019 and 2028, boosting demand for meat. Annual meat consumption per capita is set to rise by 5 kg in China and 4 kg in Southeast Asia over the same period.

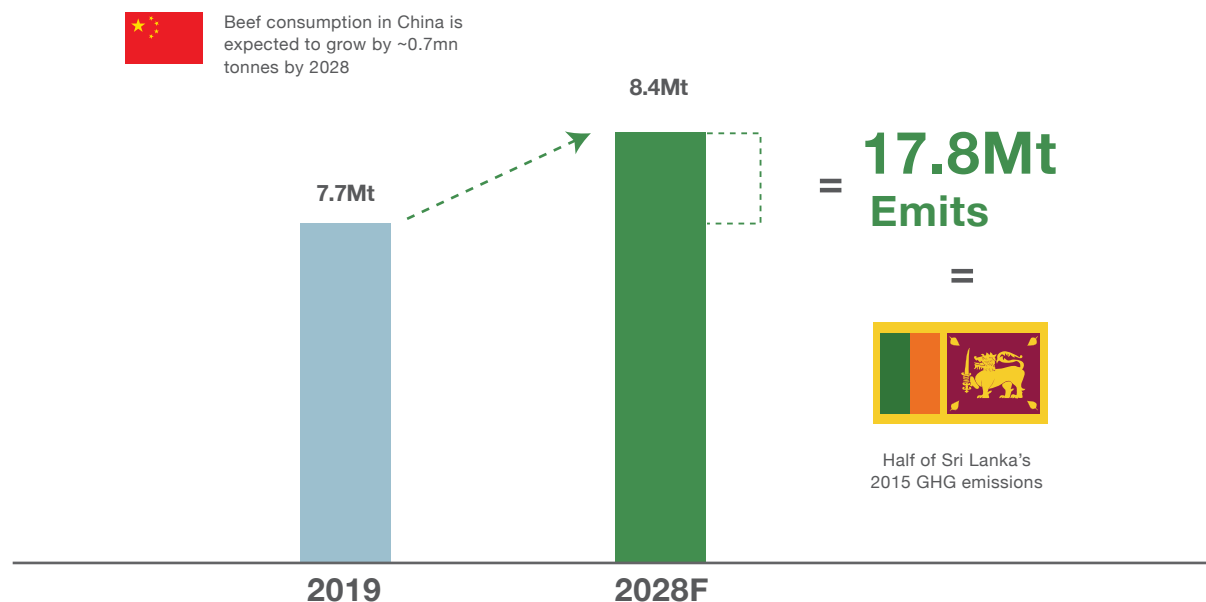
 **CWR** IF EAST "MEATS" WEST – INCREASE MEAT DEMAND



Source: CWR, OECD-FAO report, "Agricultural Outlook 2019-2028"
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Greater meat consumption is expected to be largely concentrated in poultry and pork, the two meats most widely consumed in those regions. Beef consumption, however, is also growing. By 2028, China is expected to be consuming 670,000 tonnes of beef more than it did in 2019, requiring 17.8 Mt of GHG emissions to produce – equivalent to half the annual GHG emissions of Sri Lanka over the decade.

 **CWR** GHG EMISSIONS BEHIND CHINA'S GROWING APPETITE FOR BEEF (2019-2028F)



Source: CWR, Verghese & Clune in "How to reduce your kitchen's impact on global warming" in *The Conversation* (Dec 2016), Crippa, M., Oreggioni, G., Guizzardi, D., Muntean, M., Schaaf, E., Lo Vullo, E., Solazzo, E., Monforti-Ferrario, F., Olivier, J.G.J., Vignati, E., EDGAR emissions database, EUR 29849 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-11100-9, doi:10.2760/687800, JRC117610., OECD-FAO Report "Agricultural Outlook 2019 2028",
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Source: OECD-FAO Report "Agricultural Outlook 2019 2028", Crippa, M., Oreggioni, G., Guizzardi, D., Muntean, M., Schaaf, E., Lo Vullo, E., Solazzo, E., Monforti-Ferrario, F., Olivier, J.G.J., Vignati, E., Fossil CO₂ and GHG emissions of all world countries - 2019 Report, EUR 29849 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-11100-9, doi:10.2760/687800, JRC117610.

5 ways you can do more...

1. Go vegan or flexitarian

Going vegan by eliminating animal-based foods is known as the best way to cut dietary carbon footprints, especially if plant-based foods are bought locally. According to a University of Oxford study, everyone switching to fully plant-based diets could reduce GHG emissions from food production by 49%.¹⁴⁶ A separate report estimated that vegan diets would result in 129,544 fewer heart disease-related deaths in the UK alone every year.¹⁴⁷

Diets that do not completely eliminate animal products such as meat, dairy products and eggs are known as 'flexitarian' diets with most protein derived from nuts and legumes (such as beans and lentils).¹⁴⁸ Such diets are not only more easily to achieve for meat eaters but can have as much impact on carbon emissions as vegetarian diets.¹⁴⁹ According to a UK-focused study published in the journal *Nature*, the average healthy two-thirds vegan flexitarian diet generates 763 kgCO₂e per person each year compared with 1,265 kg CO₂e for a vegetarian diet that includes dairy products. Such flexitarian diets could prevent about 11 million deaths each year by reducing diseases related to unhealthy diets such as heart attacks, strokes and some cancers.

2. Use plant-based proteins

A traditional recipe for spaghetti bolognese might require 400 grams of premium minced beef and have a carbon footprint of 10.9 kg CO₂e/kg of which 84% would be from the meat. Replacing the beef with kidney beans and lentils, also high in protein, would sharply reduce the footprint to only 2.1 kgCO₂e/kg.¹⁴² Moreover, plant-based protein tends to be healthier.¹⁵⁰

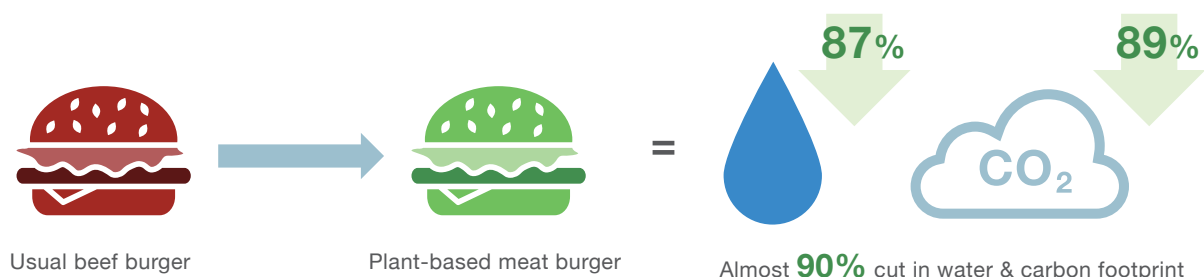
 **CWR** GHG SAVINGS FROM REPLACING MINCE BEEF WITH BEANS & LENTILS IN SPAGHETTI BOLOGNESE



Source: CWR, Verghese & Clune in "How to reduce your kitchen's impact on global warming" in *The Conversation* (Dec 2016), US EPA emissions equivalence calculator, prices" by Patrick Collinson, Jan 2019
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Interest in 'meat' made from plant-based proteins has been growing rapidly in recent years. Companies like Impossible Foods and Beyond Burger have developed plant-based products that mimic the texture and flavour of meat from livestock, and they are already reaching a wide market including several global fast-food chains such as Burger King and McDonald's.¹⁵¹ According to Impossible Foods, plant-based burgers can result in almost 90% savings in carbon and water and still contain many nutrients, albeit not the same ones as a beef burger.^{152,153}

 **CWR** CARBON & WATER SAVINGS OF A PLANT-BASED BURGER

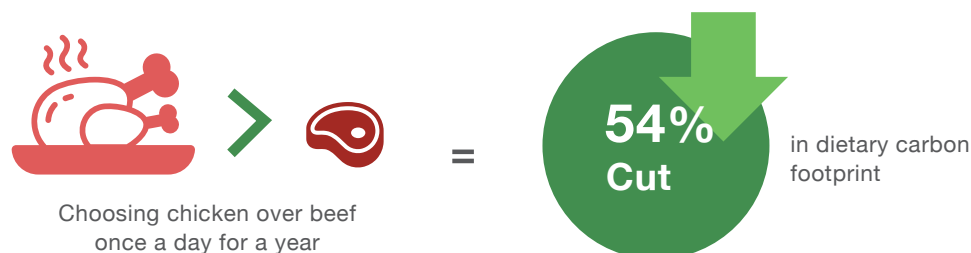


Source: CWR, Quantis, Impossible Foods, Fast Company
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3. If you have meat, opt for chicken instead of beef

As shown in previous pages, not all meat is equally carbon intensive. In terms of carbon footprints, 1 kg of chicken generates less than 4 kgCO₂e compared with more than 26 kgCO₂e for beef.¹⁴³ So choosing chicken instead of beef can have a big climate impact. A survey in 2019 found that individuals swapping beef for poultry once a day for a year could reduce their dietary carbon footprints by about 54%.¹⁶⁰ This did not adversely affect dietary quality as all poultry-based meals had the same calories as meals based on beef.¹⁵⁴

 **CWR** GHG SAVINGS FROM CHOOSING CHICKEN INSTEAD OF BEEF



Source: CWR, Rose, Diego & Willits-Smith, Amelia & Heller, Martin. (2019). Diet and Planetary Health: Single-Item Substitutions Significantly Reduce the Carbon Footprint of Self-Selected Diets Reported in NHANES (OR20-08-19). *Current Developments in Nutrition*. 3. 10.1093/cdn/nzz047.OR20-08-19.
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4. Cut down on chocolate

In addition to meat, chocolate has a high carbon footprint. It also has a high water imprint as cocoa is a very water-intensive crop.¹⁵⁵ Eating a 50 gram dark-chocolate bar three to five times a week for a year emits as much as driving a car from Paris to Madrid (about 1,250 km) and using almost 26 bathtubs of water.¹⁵⁶

 **CWR** THE GHG EMISSIONS & WATER USE BEHIND DARK CHOCOLATE



Source: CWR, BBC climate change food calculator based on Poore & Nemecek (2018)
NOTE: assumes normal petrol car driven; 1 bathtub = 200L
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Protein from insects

Insects are a source of protein that are already part of many people's regular diets. They generate far fewer emissions than other animals such as cattle, for example, which generate 6–13 times more carbon than mealworms in terms of edible protein.

Insect dishes are already being trialled in high-end concept restaurants around the world. According to the Food and Agriculture Organization of the United Nations (FAO), people already consume more than 1,400 species of edible insects as food. Using insects as livestock feed would have further beneficial impacts on the climate.

Source: The Scientist "Why Insects Should Be in Your Diet" by Aaron Dossey, Jan 2013, Huis, Arnold & Oonincx, Dennis. (2017). The environmental sustainability of insects as food and feed. A review. Agronomy for Sustainable Development. 37. 10.1007/s13593-017-0452-8.

5. Eat local and seasonal food

Global food chains offer all kinds of produce from around the world from Mexican tomatoes to bananas from Ecuador essentially all year round. But it has been estimated that transport accounts for 11% of food's carbon footprint.¹⁵⁷ Eating locally sourced food can therefore have a positive impact on the climate – but not always. Heating greenhouses with fossil fuels to grow bananas in Europe is much more carbon intensive than growing bananas in a tropical country and then shipping them to Europe, highlighting the importance of selecting produce grown in its natural climate in the appropriate season.¹⁵⁸

Sometimes saying no to produce from certain markets can help. For instance, Hong Kong was the top importer of beef from Brazil in 2019, accounting for 24% of the world's beef imports from the country – 0.4 million tonnes of carbon dioxide equivalent. Hong Kong was indirectly contributing to Amazon rainforest fires as the forests were being cleared for rearing more cattle.^{159,160}

