

CHANGING UK'S DIETARY AND CONSUMER HABITS TO LIMIT CLIMATE CHANGE



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EXECUTIVE SUMMARY

The food system is responsible for over 1/3 of global greenhouse gas(GHG) emissions. The UK's food system is a significant contributor, generating about 152-159Mt of CO₂ annually, making up approximately 20% of UK's consumption based emissions. This sector must be addressed as we enter into an era of climate crises, having already transgressed safe operating spaces for climate change. With population growth likely to continue for the next few decades, the demand for food will only increase, which makes addressing food system issues an even more urgent priority, especially with events like the global pandemic diverting attention away from various projects aimed towards climate change. There are currently no legal frameworks for food waste, and the general direction for the future of the food system is still ambiguous, with no clear plans to develop a sustainable pathway able to feed a growing population. Although no perfect solution exists, there are many opportunities towards improving efficiency and reducing emissions throughout the whole food supply chain (FSC). A combination of market based approaches, along with indirect command and control interventions which aim to nudge the population into behavioural changes along with attitudinal shifts in diets, may be the most effective way forward in terms of minimising the food system's pressures on the climate, therefore helping UK fulfil its net zero ambitions, meeting SDG goals, and staying in line with the Paris Agreement. The FSC is complexly interlinked and any changes will have some element of unpredictably and unintended consequences, but for the sole purpose of achieving a sustainable future for the food system in a realistic way that minimises damage on the environmental, new policies would be required to target food waste reductions through the removal of multi-pack discounts, the imposition of taxes for animal products, innovation for plant-based alternatives, a revision of food labelling systems, and finally encouraging consumers to choose local, organic and seasonal produce, instead of promoting Mediterranean diets.

FOUNDATIONAL SCIENCE: DISCUSSION & ANALYSIS

Dangers of climate change

Climate change is an issue we cannot afford to exacerbate. Not only is it a core planetary boundary which many other systems on Earth depend on, it has already transgressed safe operating spaces, risking permanent, irreversible damages to the

ecosystem and destroying ecological niches supporting all types of biodiversities, leading to the high likelihood of ecosystem collapse and resultant loss of human welfare¹. Certain plants and animals species have irreplaceable roles in sustaining the environment that provides us with resources like food and shelter, as they support and regulate ecosystem services with their natural life cycles, therefore we must approach the risk of depleting these critical natural capital with precautionary principle to minimise the dangers the collapse of ecosystem services will bring². Aside from potential ecosystem collapse, climate change has already caused an increase in heat waves, heavy rainfall events, disturbed atmospheric circulation patterns and melting of ice sheets³, directly impacting human livelihoods with its threats to physical health, along with economic costs that could intensify existing inequality issues within the society.

Current issues

Currently, the food system represents a huge opportunity to reduce UK's anthropogenic pressures on climate change, with annual emissions of 152-159Mt contributing to 20% of UK's overall GHG emissions⁴ (p2).

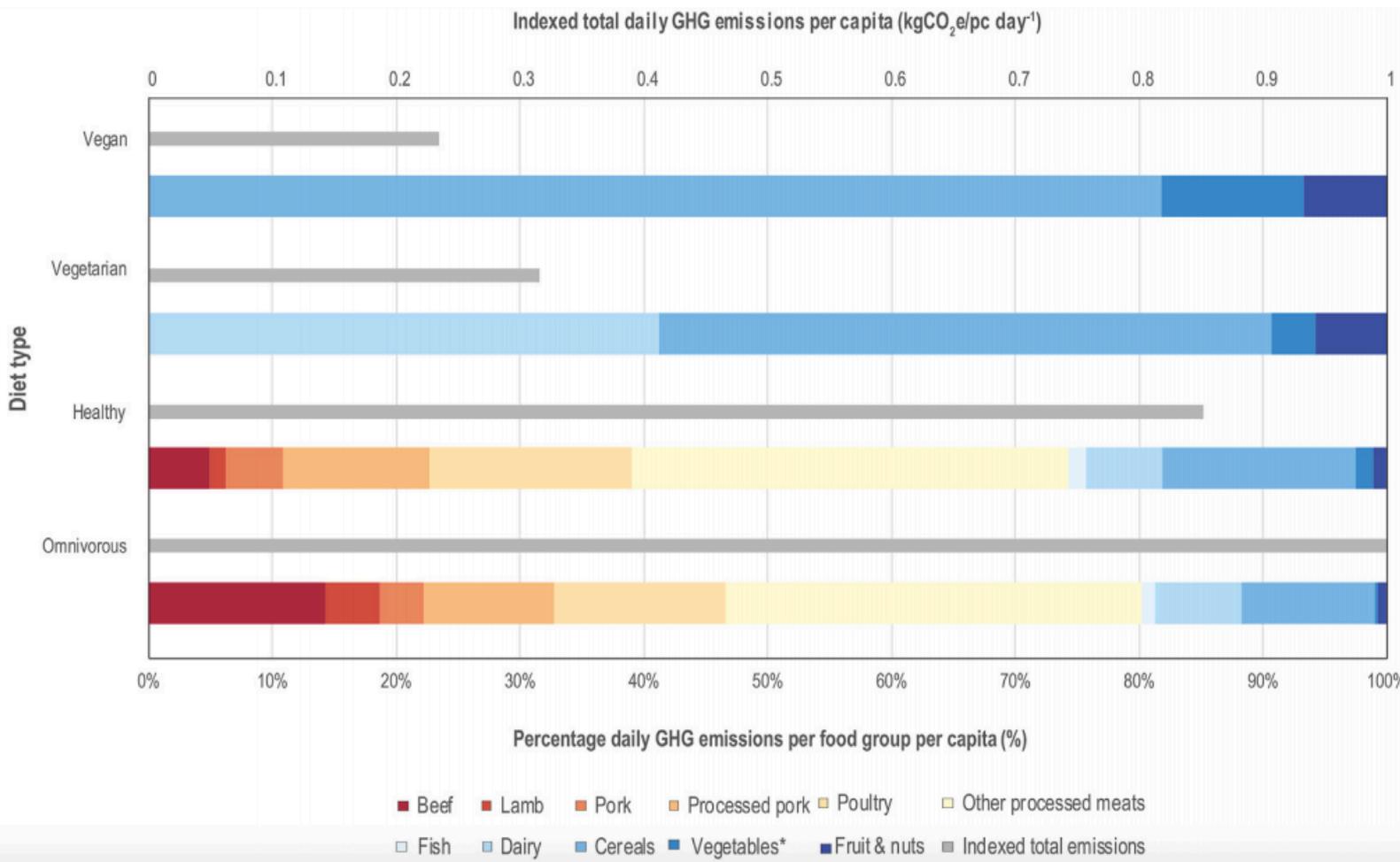
Food waste in UK alone contributes to 27Mt of GHG annually⁵ (p532), 2/3 of which was avoidable⁶ (p4). Per capita food waste is 132kg/year⁷ (p8), more than tenfold of Sub-Saharan Africa's 6-11kg/year⁵ (p532). Reducing food waste in the consumer and household level is particularly important, as they are at the end of the supply chain, meaning that food that reaches there already has a considerably higher impact compared to food wasted at production stage, due to the embedded expenditure of resources for transportation, handling, marketing, and disposal processes, on top of the food decomposing in landfills that releases even more GHG⁸ (p2).

The UK supplies 55% of its food domestically, whilst the rest comes from imports⁹. Even if supermarket shelves seem to be full most of the time, UK's high reliance on imports creates higher GHG emissions from transporting food overseas, reduces local agricultural employment, and increases vulnerability to global food price spikes¹⁰. Increasing the proportion of food supplied domestically inevitably reduces variety of foods available, but is vital for reducing emissions, with additional benefits in the form of local employment opportunities, strengthening UK's food security amidst the uncertainties with trading in a post-Brexit climate, as well as food shocks becoming more common across the world due to climate change, and finally ensuring food

stocks are sufficient to manage unprecedented events like the current COVID pandemic¹¹.

The animal intensive diet is also a big contributor towards food related emissions, as shown by figure 1, diets composed of more animal products emit significantly more GHG, with omnivorous diets producing 3X more GHG emissions than vegetarian or vegan diets^{12 (p7)}. Replacing just 50% of meat and dairy products in typical UK diets with fruits, vegetables and cereals, can already lead to 19% decrease in GHG emissions^{13 (p2)}. In addition to lower global warming potential, reducing red meat consumption may also be beneficial for health, decreasing chances of heart diseases, strokes and several types of cancers^{13 (p2)}, bringing wide ranges of benefits that stretch beyond environmental impacts.

Figure 1: Comparison of daily GHG emissions per capita from different diets in the UK^{12 (p7)}



Finally, UK's population is projected to increase at least 4.5% between 2018 and 2028, and with noted trends for overconsumption¹² (p2), on top of food waste increasing around the world due to widespread globalisation, urbanisation and growth of middle class, affluent societies who can afford surplus food⁸ (p6), pressures on local and international food systems will only increase. Being a developed nation, UK holds responsibility to mitigate GHG emissions faster and further than developing nations¹² (p2), whilst also ensuring it meets the climate goals set by Paris Agreements, and holding accountable for its own carbon neutral ambitions by 2050.

ASSESSMENT OF CURRENT GOVERNANCE

Existing strategies

Previous food guidelines have relied on EU frameworks, with 16 different departments in the UK government collaborating towards creating food policies, however DEFRA are mainly responsible for the sustainability aspects of the food system¹⁴. Post-Brexit governance strategies have now mainly relied on separate voluntary organisations, supporting them indirectly with funding from DEFRA, for example 'WRAP' which manages food waste¹⁵, or through formal partnerships, such as 'National Food Strategy', a newly formed independent review panel commissioned by the government exploring potential sustainable pathways for the food system¹⁶. Many other organisations addressing food sustainability are charities funded by various foundations, for example 'Food Research Collaboration', who conduct evidence based research to inform relevant audiences about food sustainability¹⁷, with the help of funding from Esmee Fairbairn Foundation and City, University of London¹⁸.

Dietary guidelines

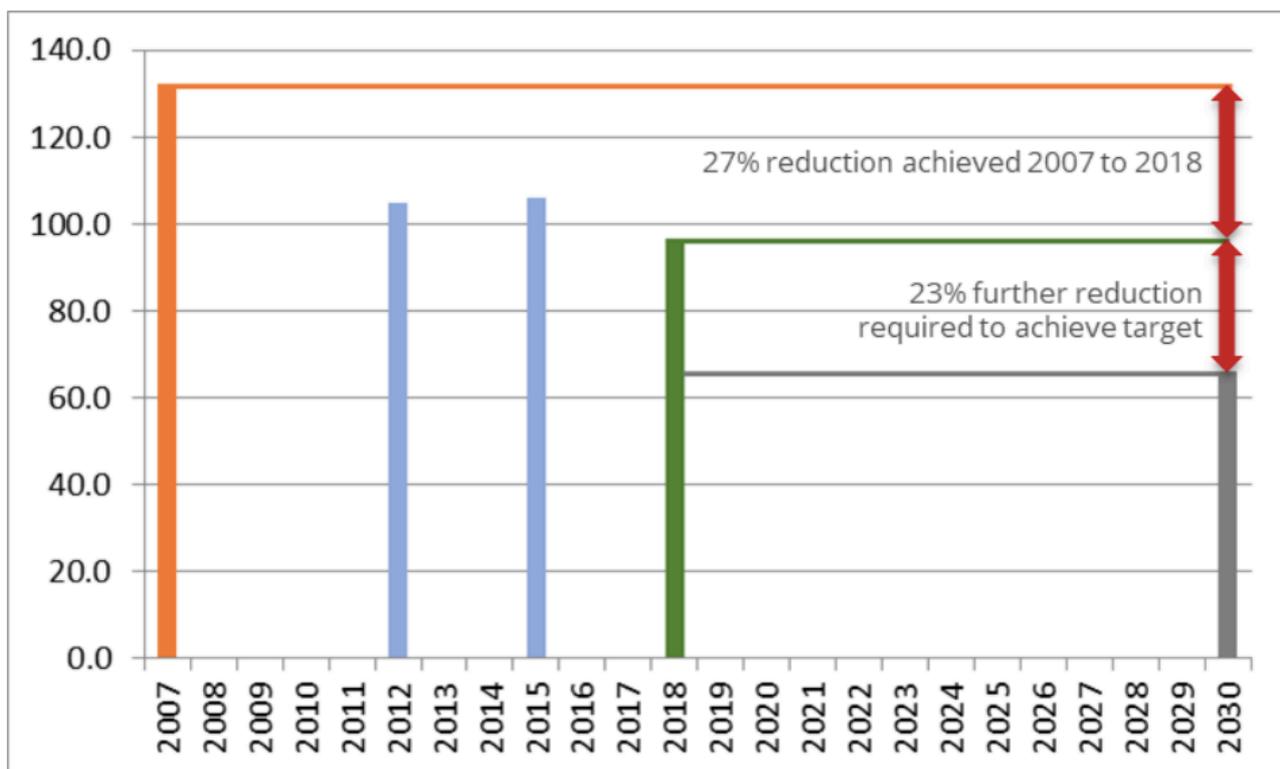
Even though dietary guidelines have been developed to recommend sustainable food consumption, they are not incorporated into the UK national dietary guidelines (EatWellGuide)¹³ (p3). People are aware of the environmental benefit associated with adopting various sustainable dietary recommendations, but do not fully understand which behaviours offers largest environmental benefit¹³ (p11). As opposed to other countries such as Sweden, whose national dietary guidelines actively promote traditional, local, and seasonal produce, the EatWellGuide recommends a Mediterranean diet, which despite its health benefits, contains many non-native foods that results in more air freight food being imported¹³ (p10), adding unnecessary GHG emissions to the 10% of emissions responsible from transporting food¹⁹ (p34). The

EatWellGuide also fails to directly recommend reducing the consumption of animal products, which has the highest environmental impact of all food groups, although it may be argued their recommendation for the Mediterranean diet itself is already low in meat and dairy.

Food waste

WRAP are mainly responsible for reducing waste and its related emissions, through 'The Courtauld Agreement 2025', a voluntary agreement aiming to bring together organisations across the entire FSC to cut down food and drink waste to 20% over a period of 10 years, through the cooperation and partnership of governments, individual companies and community groups⁷. This has resulted in some success as shown by the trend of decreasing food waste in figure 2. With a 19% upsurge of restaurants and supermarkets using food redistribution organisations^{12 (p12)}, food waste has decreased by 2% per year using the 2015 baseline, on track to meet the Courtauld commitment, and also halving UK's per capita food waste by 2030 in line with SDG 12.3⁷. However, this is arguably an unambitious target, as even upon reaching these

Figure 2: Progress towards SDG12.3 (UK food waste arisings excluding inedible parts; kg per capita per year)^{7 (p11)}



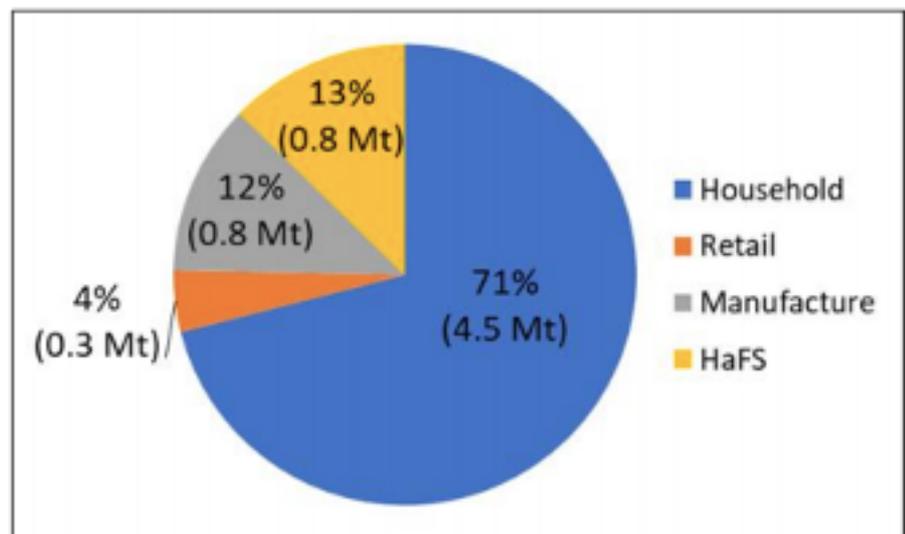
targets, 10 million tonnes of CO2 would still arise from food waste^{20 (p3)}, with per capita food waste still over 60kg. Whilst efforts towards decreasing food waste should be acknowledged, the lack of mandating or incentives towards food redistribution, and the absence of top down management to control the actual amount of food supplied, suggests substantial improvements could still be made. Of course, this hasn't been helped with the ongoing pandemic causing last minute announcements of lockdowns in different parts of UK, making it harder than ever for businesses to plan stock levels and inevitably resulting in more food waste^{21 (p2)}, but that shouldn't justify the government's inactivity and lack of policies towards reduce food waste effectively.

GOVERNANCE RECOMMENDATIONS

Remove multipack savings

The FSC is complex and interlinked, and applying changes to one sector will certainly affect other sectors too^{22 (p1)}. However, the most crucial sector to address would be households, as shown in figure 3, they are by far the biggest generators of food waste with over 70%, therefore presenting the largest opportunities for large scale food waste reductions^{7 (p2)}. By reducing multipack savings that sell larger volumes of foods than consumers necessarily need, there will be more consumers/households with stronger self efficacy, who can plan the quantity of food needed rationally without getting distracted⁸. Businesses may see a reduction in profit following this change, but this loss can be seen as negligible since decreasing food waste has net positive benefits on the economy⁷.

Figure 3: 2018 UK's food waste by sector post farmgate, excluding inedible parts^{7 (p2)}



Animal products taxation

Education and information about food waste is important, but food waste will still be inevitable in some cases, therefore normalising the substitution of animal products for

plant based alternatives, which are 21x more emissions intensive in UK^{12 (p4)}, may provide a simpler pathway towards a sustainable diet, that is healthy to humans and the climate. Even if food is wasted then, the overall contribution towards GHG emissions would be significantly less. By taxing animal products, consumers may be nudged into opting for cheaper alternatives that are plant-based, which means instead of forcing consumers into choosing more environmentally plant-based options, their choice to purchase animal products will now be reflected in the higher price they have to pay, and this tax fund could be reinvested towards developing plant-based alternatives which are more attractive to consumers^{12 (p13)}, or campaigns such as 'Love food hate waste', which has helped save £5 billion and 5 million tonnes of CO2 per year compared to 2007²³.

Food labelling

Aside from direct market intervention, the government could intervene directly by requiring food companies to imprint respective ecological footprints for producing the food, similar to the 'climate labelling' system in Denmark, and already seen in some UK companies such as meat alternative brand 'Quorn', who label products with carbon footprints(verified by Carbon Trust)^{12 (p13)}. With various research showing environmental impact to be the third most important consideration following cost and health^{13 (p9)}, informing consumers about their environmental impact from their food choices may further reduce the consumption of high emissions products, especially once the animal tax is imposed in conjunction to further encourage the uptake of plant based options.

Another thing to consider for food labelling is the expiry date, as consumers may be confused by the terms 'best before', 'use by', or 'display until', leading to unnecessary food waste as consumers may be misguided into thinking food is inedible. Having simple messages on food packaging to explain the significance of these dates, along with educating the safety of certain foods' (e.g pasta's) ability to be consumed a year after its 'best before' date²⁴, will help households make informed decisions before mindlessly discarding edible products.

Further policy reforms should explore the possibility of making food donations more flexible beyond their best before and use by dates for certain foods, as FSC stakeholders often fear the responsibility of liability risks, which can be overcome with designated departments carrying out hygiene checks and tracking information of surplus food items, as seen in France^{6 (p13)}.

New dietary guidelines

Finally, replacing EatWellGuide's dietary recommendations to be more plant-based, with special emphasis on choosing local, seasonal and organic produce, will lead to even lower emissions from the food system. Life cycle analysis concluded that avoiding air freighted foods, choosing organic over conventional produce, and reducing meat consumption are the diet related behaviours which have the largest overall environmental benefit¹³ (p9). This would mean overcoming the challenge of different types of consumers in UK being engaged with some aspects of sustainable diets, such as choosing organic, but resistant to others, for example replacing red meat. Those with strong attachment to meat consumption may deny its negative impacts to reduce their cognitive dissonance, and so for these consumers it may be better to promote replacing conventional red and processed meat products with lower environmental impact alternatives, such as white meat and sustainable fish, as they have been shown to be more readily accepted than plant based protein sources¹³ (p9).

It may have to be accepted that red meat and animal products can't be completely phased out, but at least with recommendations to reduce the consumption of these foods, emissions would still be reduced. Government policy should therefore explore which local and seasonal produce can create a healthy diet similar to the Mediterranean diet it currently promotes, and integrate them into national dietary guidelines, whilst also subsidising local agriculture to ensure these foods are not imported and produced locally instead¹³ (p10).

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