



SHEFS

**RESEARCH
SYNTHESIS REPORT**

United Kingdom

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SUMMARY

- This report is presented by the Sustainable and Healthy Food Systems (SHEFS) research consortium.
- The report focuses on the role of dietary shifts in delivering positive health and environmental outcomes in the UK.
- SHEFS UK has conducted research to understand what diets we should be aiming for, how they can they be supplied and what barriers need to be overcome.
- Three key insights for policy-makers are identified:
 - » **Insight #1:** Aligning diets with the Eatwell Guide and 5-a-day programme would contribute to both environmental and health outcomes.
 - » **Insight #2:** Replacing some meat production with horticulture in England could help assure future food security and deliver environmental and health outcomes, but will require a shift in consumer preferences.
 - » **Insight #3:** Support for low-input farming systems could both benefit biodiversity and increase the affordability of foods from these farms.
- Three associated policy actions are proposed:
 - » **Policy Action #1:** Establish strong governance mechanisms to ensure collaboration between departments and longevity of focus.
 - » **Policy Action #2:** Coordinate across Government to facilitate a shift in diets towards healthier and more sustainable food.
 - » **Policy Action #3:** Provide relevant funding to diverse types of farming systems and manufacturers.

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WHAT IS SHEFS?

Sustainable and Healthy Food Systems (SHEFS) is an international research consortium that conducts rigorous and policy-relevant research on the linkages between food, health and the environment. SHEFS uses novel techniques to generate and synthesise evidence, and to help decision-makers create policies that deliver nutritious and healthy diets in an environmentally sustainable and socially equitable manner. The research has been conducted by multiple partners across several disciplines, based in the UK, South Africa and India.

The UK component of SHEFS is housed at the London School of Hygiene & Tropical Medicine (LSHTM), City, University of London, University College London and The Food Foundation.





Policy context

The **Government Food Strategy**, published by the Department for Environment, Food and Rural Affairs (DEFRA) in June 2022, set the ambitious goal to 'deliver healthier, more sustainable and affordable diets for all'.

To successfully achieve this goal, it is essential that government policies and programmes take targeted and well-evidenced action.

In 2018, then Secretary of State for DEFRA, Michael Gove, commissioned Henry Dimbleby to undertake an independent review of England's food system. This review culminated in *The Plan* – which was published in July 2021 and included 18 recommendations for Government.

The **Government Food Strategy** responds to some, but not

all, of these recommendations. At the time of its publication, it was expected to be followed by a Health Disparities White Paper from the Department of Health and Social Care (DHSC), which it was presumed would respond to other recommendations from *The Plan*.

Since the **Government Food Strategy's** publication, new Secretaries of State have been appointed at both DEFRA and DHSC. The status of the Health Disparities White Paper is now uncertain. It is also not yet clear to what extent the new Secretary of State for DEFRA will wish to revise or add to the commitments made in the **Government Food Strategy**.

The report is written in response to the **Government Food Strategy**, and it seeks to inform future policy decisions.





How can everyone in the UK access and afford a healthier, more sustainable diet? Three key insights from SHEFS

A change in diets in the UK is vital if the Government is to successfully reduce greenhouse gas emissions to achieve net zero by 2030, reduce health disparities and the prevalence of non-communicable diseases (NCDs), and benefit nature. In studying the links between diets and greenhouse gas emissions, NCDs, land use and biodiversity, the research from SHEFS offers three key insights related to diets that policy-makers should take into consideration when developing future policy initiatives and programmes.

INSIGHT #1: Aligning diets with the Eatwell Guide and 5-a-day programme would contribute to both environmental and health outcomes

The Eatwell Guide and the 5-a-day programmes offer an important pathway for delivering both environmental and health outcomes.

A modelling study from SHEFS researchers (SHEFS output 1) showed that a shift towards diets that met five or more of the nine Eatwell Guide recommendations could not only reduce the risk of mortality in the UK by 7% but also lower UK dietary greenhouse gas emissions by 30%. Current UK diets on average meet only 3–4 of the recommendations. Another study from SHEFS researchers (SHEFS output 2) modelled the impact of increasing the consumption of fruits and vegetables to adhere to the 5-a-day standard (while reducing meat and sugar consumption) on health, the environment and affordability. It found that increasing fruit and vegetable consumption would not only result in approximately a 7–8 month increase in healthy life expectancy in the UK, but would also translate to a 4–8% decrease in greenhouse gas emissions and up to a 1% reduction in water footprints. If consumers began eating five

fruits and vegetables a day, they could contribute to 10–31% of the target set out by the UK Climate Change Committee to reduce domestic land-based emissions by 37 megatons within 30 years.

Both studies show that environmental and health benefits would be gained through replacing calories consumed through meat consumption with fruits and vegetables, particularly vegetables (SHEFS outputs 1 and 2). Vegetables were considered to be a realistic replacement for meat in some meals, while fruit was considered as a replacement for sweet snacks. Of the individual Eatwell guidelines, adherence to the recommendation on fruit and vegetable consumption is associated with the largest reduction in total mortality risk (10%) and increased adherence to the recommendation on red and processed meat consumption is associated with the largest decrease in environmental footprints (SHEFS output 1).

INSIGHT #2: Replacing some meat production with horticulture in England could help assure future food security and deliver environmental and health outcomes, but will require a shift in consumer preferences

If the UK population were to adhere to the Eatwell guidelines, there would need to be an increase in the supply of fruits and vegetables. This could be achieved through increased domestic horticultural production, increased imports of fruits and vegetables, or by a combination of the two.



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The **Government Food Strategy** stated that the UK Government will support growth in the horticultural production sector in the UK to assure food security and healthier diets, including by development of a new horticulture strategy for England. This is a welcome approach as it will reduce the country's reliance on fruit and vegetable imports from climate-vulnerable countries. A study from SHEFS researchers (SHEFS output 3) found that the proportion of fruit and vegetables supplied to the UK market from climate-vulnerable countries increased from 20% in 1987 to 32% in 2013. Reversing this trend could help to assure livelihoods for domestic farmers, while also safeguarding UK food security against the increasing shocks to production likely to be experienced by climate-vulnerable countries.

Increasing domestic production of fruits and vegetables may also provide the added benefit of helping to meet biodiversity targets if some grazing land is converted to a mix of natural land covers and horticulture production. SHEFS researchers (SHEFS output 4) showed that land use changes associated with healthier diets could also have benefits for biodiversity in the UK and potentially increase resilience to climate change. The biodiversity benefits in this model would occur largely because the dietary energy equivalent replacement of meat with vegetables has the potential to result in the use of less land for agricultural production, thereby freeing up land for alternative uses such as natural land covers. The extent to which these benefits are achievable would therefore be dependent on how landowners chose to use the surplus land.

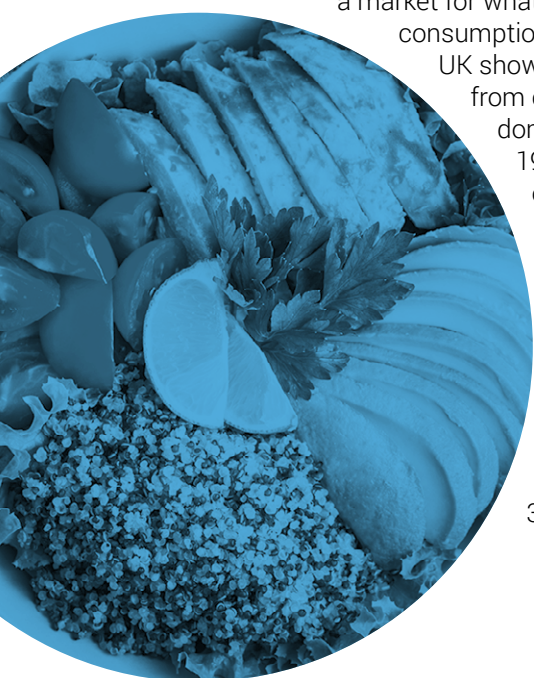
However, farmers are unlikely to shift to or increase horticultural production if they are not assured a market for what they grow. And consumption trends in the UK show a shift away from crops grown domestically. Since 1987, the contribution of tropical fruits to UK diets has rapidly increased while that of more traditional vegetables, such as cabbages and carrots, has declined (SHEFS output 3). An analysis

of food consumption data from the National Diet and Nutrition Survey 2008–2019 indicates that consumers are interested in decreasing meat consumption as purchases of plant-based alternative foods are increasing to replace meat – but this is not translating into a wider shift to increased fruit and vegetable consumption (SHEFS output 5). If the aim is for a boost in domestic horticultural production to drive a boost in domestic fruit and vegetable consumption, a shift in consumer preferences and expectations on the ratio of imported to domestic fruits and vegetables consumed will also be required.

INSIGHT #3: Support for low-input farming systems could both benefit biodiversity and increase the affordability of foods from these farms

Making healthy and sustainable diets affordable is crucial to their successful adoption by consumers. As the food system is currently structured, increasing fruit and vegetable consumption to 5-a-day would also increase the cost of diets (SHEFS output 2). Of the various scenarios modelled, the highest costs associated with increasing fruit and vegetable consumption were from those where the increased fruit and vegetables consumed were grown in the UK (as opposed to imported). In these scenarios, prices ranged from £7.21 to £7.24 per person per day – compared to a current average diet cost of £6.78 per person per day. This is due to a higher average cost of fruits and vegetables compared with what they replace in the diet, particularly sweet snacks. The lower cost of sweet snacks is a result of sugar being cheap and easy to store and transport.

Producing food within a 'three compartment model' – a mixture of agricultural intensification, land sparing and land sharing – may also risk further perpetuating price disparities and economic inequities, with 'high-output' food produced in intensification/land sparing systems (e.g. high-input monoculture systems) and 'high-quality' food produced from land sharing systems (e.g. organic and mixed farming systems, agroforestry, etc.). Integrating land sharing systems into the UK's agricultural landscape is essential for providing diversity that can protect against future climate and environmental changes (*The Plan*). For example, diversifying crops in integrated systems (e.g. agroforestry) will be essential for both mitigating and adapting to climate change in British agriculture. Payments for environmental services, such as the Environmental Land Management scheme, can help mitigate the impact of yield losses from low-intensity farming systems on consumer food prices.





Policy implications

The insights above lead to three associated policy actions, which policy-makers should consider.

POLICY ACTION #1: Establish strong governance mechanisms to ensure collaboration between departments and longevity of focus

Food policy is a broad and complex realm that covers several government departments, each with a unique focus. An analysis of food policymaking in England led by SHEFS researchers showed that 16 government departments play a role in shaping food policy (SHEFS output 6). In the *Government Food Strategy*, DEFRA recognises that it is responsible for food policy and says it will 'join-up within government to collectively drive progress' to deliver the strategy. Yet there is very little discussion of DEFRA's role in driving health outcomes. This indicates that limited collaboration with the DHSC, the Department of Education (DfE), the Food Standards Agency (FSA), etc. has been undertaken while developing this strategy. These departments function in siloes, with different priorities and objectives. This results in UK food policy, as in most other countries, being disparate and fragmented. SHEFS research has shown that there is the potential to achieve substantial co-benefits between environmental

outcomes and achieving dietary guidelines. The DfE, FSA, and DHSC – particularly the Office for Health Improvement and Disparities – need to work collaboratively with DEFRA to successfully maximise these co-benefits in future food policies.

POLICY ACTION #2: Coordinate across Government to facilitate a shift in diets towards healthier and more sustainable food

Currently, only 0.1% of the population adheres to all nine Eatwell Guide recommendations, with less than one in three people adhering to five or more (SHEFS output 1). The success of the 5-a-day campaign since 2003 has been similarly limited. While these programmes have succeeded in educating the public in what a healthy diet should look like, they have not driven substantial behavioural change.

However, consumption trends show that many people are already open to changing their dietary patterns towards more sustainable foods. Consumption of plant-based alternative foods is increasing and appears to be accelerating in the UK – although their contribution to dietary intake remains small (SHEFS output 5).

If policy-makers are to successfully support the large-scale dietary shifts that are necessary to meet net zero targets and to improve population health, then different approaches will be needed,





focusing less on interventions such as educational programmes, which require a high degree of individual agency. Policies which make healthier, sustainable food choices easier and more affordable need to be explored. These types of policies will help to disrupt the Junk Food Cycle – the negative feedback loop between our natural preferences for energy dense foods, and the ease with which industry can manufacture and market these type of foods – as described by Henry Dimbleby in *The Plan*.

There is evidence that the UK Soft Drinks Industry Levy has had an impact on reformulation, and this suggests that such targeted fiscal measures could be effective in steering the consumption of specific foods among consumers. A modelling study from SHEFS researchers (SHEFS output 7) showed that a 20% price increase in high sugar snacks could reduce the UK prevalence of obesity by 2.7 percentage points. Revenue from such fiscal measures could be put towards ensuring the affordability of sustainably produced fruit and vegetables and alternative forms of protein.

POLICY ACTION #3: Provide relevant funding to diverse types of farming systems and manufacturers

The *Government Food Strategy* indicates that it will support and promote the ‘three compartment model’ of intensification, land sparing and land sharing in its land use framework. It also states this will be supported with investments in farming innovation to increase productivity. It is crucial that efforts to increase productivity, such as through the development of new farm machinery or R&D, take into consideration the different needs of low-input, organic and mixed farming systems. Increasing fruit and vegetable consumption and reducing meat consumption is achievable at the same time as improving biodiversity if some grazing land is allocated to natural land covers. However, to make these shifts in land use, environmental land management schemes will need to be designed to incentivise farmers accordingly.

Ensuring funding and support flows equally to farms working in both the intensification/land sparing and the land sharing segments of the ‘three compartment model’ will have a significant long-term impact on the price of food coming out of these different farming systems. Increased R&D and investment in these farming systems will bring down the costs of sustainably produced foods by increasing their productivity and contribute to making foods produced on these farms affordable to more consumers.





References

1. **Government Food Strategy:** Department for Environment, Food and Rural Affairs (2022). Government Food Strategy. Available at: <https://www.gov.uk/government/publications/government-food-strategy>
2. **The Plan:** National Food Strategy (2021). The Plan. Available at: <https://www.nationalfoodstrategy.org/the-report/>
3. **SHEFS output 1:** Scheelbeek, P., Green, R., Papier, K., Knuppel, A., Alae-Carew, C., Balkwill, A., Key, T., Beral, V., Dangour, A. (2020). Health impacts and environmental footprints of diets that meet the Eatwell Guide recommendations: analyses of multiple UK studies. *BMJ Open*. 10:e037554. Available at: <https://bmjopen.bmj.com/content/10/8/e037554>
4. **SHEFS output 2:** Eustachio Colombo, P., Milner, J., Scheelbeek, P., Taylor, A., Parlesak, A., Kastner, T., Nicholas, O., Elinder, L., Dangour, A., Green, R. (2021). Pathways to '5-a-day': modeling the health impacts and environmental footprints of meeting the target for fruit and vegetable intake in the United Kingdom. *American Journal of Clinical Nutrition*. 114:530–539. Available at: <https://academic.oup.com/ajcn/article/114/2/530/6237553>
5. **SHEFS output 3:** Scheelbeek, P., Moss, C., Kastner, T., Alae-Carew, C., Jarmul, S., Green, R., Taylor, A., Haines, A., Dangour, A. (2020). United Kingdom's fruit and vegetable supply is increasingly dependent on imports from climate-vulnerable producing countries. *Nature Food*. 1, 705–712. Available at: <https://www.nature.com/articles/s43016-020-00179-4>
6. **SHEFS output 4:** Ferguson-Gow, H., Nicholas, O., Outhwaite, C., Green, R., Scheelbeek, P., Eustachio Colombo, P., Wheeler, A., Taylor, A., Dangour, A., Mace, G., Pearson, R. (2022). Potential for positive biodiversity outcomes under diet-driven land use change in Great Britain. *Wellcome Open Research*. 7:147. Available at: <https://wellcomeopenresearch.org/articles/7-147/v1>
7. **SHEFS output 5:** Alae-Carew, C., Green, R., Stewart, C., Cook, B., Dangour, A., Scheelbeek, P. (2022). The role of plant-based alternative foods in sustainable and healthy food systems: Consumption trends in the UK. *Science of the Total Environment*. 807:151041. Available at: <https://www.sciencedirect.com/science/article/pii/S0048969721061192>
8. **SHEFS output 6:** Parsons, K. (2020). Who makes food policy in England? A map of government actors and activities. *Rethinking Food Governance – Report 1*. London: Food Research Collaboration. Available at: <https://foodresearch.org.uk/publications/who-makes-food-policy-in-england-map-government-actors/>
9. **SHEFS output 7:** Scheelbeek, P., Cornelsen, L., Marteau, T., Jebb, S., Smith, R. (2019). Potential impact on prevalence of obesity in the UK of a 20% price increase in high sugar snacks: modelling study. *BMJ*. 366:14786. Available at: <https://www.bmj.com/content/366/bmj.l4786>



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