POLICY BRIEF 1:
Is the UK’s supply of fruit and vegetables future proof?
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SUMMARY

• The UK’s supply of fruit and vegetables and the quantity being eaten is far below the requirements needed to be healthy.

• Most fruit and vegetables on the UK market is not produced in this country. The UK supply of fruit and vegetables has become increasingly reliant on imports, particularly from countries that are vulnerable to climate change and water scarcity.

• Projected environmental changes will affect fruit and vegetables production. Global fruit and vegetable supply will become increasingly threatened without substantial adaptation strategies, especially in tropical countries.

• In order to ensure a resilient supply of fruit and vegetables, policy changes are needed to promote changes in production, trade and consumption.

This briefing is based on the findings in the pre-print paper “Resilience of UK fruit and vegetable supply: environmental threats to the supply of “5-a-day” by SHEFS researchers.
We need to increase the amount of fruit and vegetables per day, which is substantially below the government dietary recommendations, captured in the Eatwell Guide, of about seven portions per day. Consumption of fruit and vegetables shows strong, wealth-related differences – the highest income groups consume about 1.5 portions per day more than the lowest.

WHAT CHANGES ARE NEEDED TO UK FRUIT AND VEGETABLE CONSUMPTION TO MEET HEALTH GOALS? In order to meet dietary recommendations, promote health, and prevent disease, we need to increase the amount of fruit and vegetables we consume on average by 86% in the UK. Action must be taken to help people to change their eating habits and address the barriers that prevent people from being able to meet the recommendations. However, there are environmental implications of increasing fruit and vegetable consumption that require careful consideration to ensure that consumption increases are sustainable.

WHAT IS CURRENT UK FRUIT AND VEGETABLE CONSUMPTION? In the UK, on average adults* eat just under four portions of fruit and vegetables per day, which is substantially below the government dietary recommendations, captured in the Eatwell Guide, of about seven portions per day. Consumption of fruit and vegetables shows strong, wealth-related differences – the highest income groups consume about 1.5 portions per day more than the lowest.

WHAT IS THE CURRENT UK SUPPLY OF FRUIT AND VEGETABLES? The UK currently domestically produces 35% of the total supply of fruit and vegetables (3.1 million MT/year) with net imports making up the other 65% (5.7 million MT/year). Total supply is below the amount required for everyone to meet recommendations (Figure 1), and that is before accounting for food waste: an estimated 23% of fruit and vegetables is wasted after leaving the farm. If everyone ate seven portions a day, the fruit and vegetable supply would need to increase by approximately 7.8 million MT/year after taking into account food waste at current levels.

HOW DOES THIS COMPARE TO GLOBAL SUPPLY AND DEMAND? Global supply of fruit and vegetables is 552g per person, but that is before accounting for food waste. Based on FAO estimates of food waste in different regions, the world only produces 82% of the amount recommended to be consumed (based on the five portions a day recommended by the World Health Organisation). If consumption was optimal there would, therefore, be a need to drive up fruit and vegetable production and supply in the UK and globally.

HOW HAVE FRUIT AND VEGETABLE IMPORTS AND CONSUMPTION CHANGED? The UK has become increasingly dependent on imports of fruit and vegetables, with contribution from domestic production having decreased by 48% between 1987 and 2013. International trade has increased the diversity of fruit and vegetable supply giving people more options to choose from and delivering the health benefits of eating a range of fruit and vegetables. Consumption patterns have also changed: for example, consumption of imported tropical fruits has rapidly increased, whilst consumption of some traditional vegetables that can be grown in the UK has declined (Figure 2).
Environmental implications of UK fruit and vegetable imports

COUNTRIES OF ORIGIN OF IMPORTED FRUIT AND VEGETABLES
A large proportion of total UK fruit and vegetable supply comes from Europe and in particular from Spain (providing >10% of the total UK fruit and vegetable supply) and Italy (providing between 5-10%). In addition to Europe, we also import from many other countries across the world.

UK FRUIT AND VEGETABLE IMPORTS FROM WATER SCARCE COUNTRIES
The supply of fruit and vegetables from countries likely to face high to extremely high water scarcity in the near future (2040) has increased from 41% to 54% over the period 1987 to 2013. 76% of the freshwater used in the production of fruit and vegetables supplied to the UK is withdrawn elsewhere including from countries with high risk of water scarcity such as Spain, South Africa, Chile, Morocco and Israel (Figure 3). In countries where climate change has led to increasing unreliability of rainfall, more ground and surface water is being used to grow crops. This may lead to increased water scarcity along with increased competition for water resources from other sectors including industry and supply direct to the population.

UK FRUIT AND VEGETABLE IMPORTS FROM CLIMATE VULNERABLE COUNTRIES
Some countries are considered to be more vulnerable to climate change than others. The Notre Dame Global Adaption Initiative (NDGAIN) country index defines climate vulnerable countries based on indicators of vulnerability and readiness to adapt to climate disruptions. The UK is classified as ‘least vulnerable’. In 2013, 32% of UK fruit and vegetable imports were from areas defined as climate vulnerable, a 60% increase since 1987. Figure 4 shows the climate vulnerability classification of the countries we are most reliant on for the UK supply of fruit and vegetables. Eight out of twenty-one of these countries are classified as moderately or highly vulnerable to climate change. Graph 1 shows what proportion of different types of fruit and vegetables we import from these climate vulnerable countries. For example, the majority of tropical fruits originate in climate vulnerable countries, while leafy and root vegetables are largely from countries with low vulnerability.
IS THE UK’S SUPPLY OF FRUIT AND VEGETABLES FUTURE PROOF?

A growing reliance on imported fruit and vegetables, particularly from water scarce and climate vulnerable countries, could jeopardise the resilience of our supply chains. Ongoing climate and environmental changes are already putting increasing pressure on global agricultural production and are predicted to further threaten fruit and vegetable availability, as well as other environmental changes.

The number of hot days, minimum and maximum daily temperatures and length of the rainy season all substantially affect the potential to grow certain crops in different places and deliver good yields. In many hot climates a further increase in temperature will reduce yields as it pushes temperatures further above the optimal range for crop growth. Whilst increased carbon dioxide (an important greenhouse gas) in the atmosphere could stimulate faster crop growth, it can also reduce vitamin and mineral concentrations in crops, including fruits and vegetables. Furthermore, rising temperatures will increase ground-level ozone formation which could reduce crop growth, and can cause visible bruising which reduces market value. Climate change can also increase crop losses and damage due to pests, pathogens, fungi and weeds. Other changes such as land degradation, deforestation, water salinity and biodiversity loss are also expected to increasingly affect global fruit and vegetable production.

Models suggest that climate induced changes to fruit and vegetables availability would be one of the largest drivers of climate-related deaths by 2050.

WHAT THIS MEANS FOR THE UK

A growing reliance on imported fruit and vegetables, particularly from water scarce and climate vulnerable countries, could jeopardise the resilience of our supply chains. Ongoing climate and environmental changes are already putting increasing pressure on global agricultural production and are predicted to further threaten fruit and vegetable supply. Declines in yields could result in sudden decreases in availability and potentially strong price fluctuations on the UK market. Of the total fruit and vegetable supply to the UK, 26% is imported from countries that are moderately vulnerable to climate change. Another 6% is imported from countries that are highly or extremely vulnerable to climate change, and will likely face fruit and vegetable yield losses in the near future, if no action is taken. Climate induced reduction in yield will particularly affect subtropical areas where much of our fruit comes from. Several recent fruit and vegetable shortages demonstrate these effects (Box 1). With average fruit and vegetable intake already below recommended levels, decreased supply and increased price could be highly unfavourable for population health. This would likely have greater impact on lower income households who already have lower consumption.

EXPECTED CLIMATE AND ENVIRONMENTAL CHANGES WILL AFFECT GLOBAL PRODUCTION OF FRUIT AND VEGETABLES

Climate changes are expected to become more profound in the future. There are expected to be increases in temperatures and decreases in water availability, as well as other environmental changes.

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BOX 1 Examples of shortages of fruit and vegetables in the UK

- **Avocado shortage 2017**: Prices surged more than 50% related to droughts in California and floods in Latin America.
- **Courgette, lettuce and spinach shortages 2017**: Supermarkets banned bulk buying after decreased supply following extreme cold winters in Italy and Spain. As a result, there was a 300% increase in price of romaine lettuce compared with the previous year.
- **Cauliflower shortages 2019**: Heavy rainfall destroyed crops in the UK, and alternative European supplies wilted in heatwaves.

“Climate change can also increase crop losses and damage due to pests, pathogens, fungi and weeds”
Current supply and demand of UK fruit and vegetables is insufficient to meet requirements for health, and climate change will further threaten supply in the future due to our current reliance on imports from climate vulnerable countries.

Future briefs in this series will explore the health and environmental impacts of increasing fruit and vegetable production and consumption, and will make recommendations on the policy changes needed to promote changes in consumption, production and trade to ensure resilience of the UK fruit and vegetable supply.

REFERENCES