



D1 Food Security and Nutrition

Good quality food and nutrition are essential for human life, child development, good health, the maintenance of a healthy weight, and prevention of diseases such as cancer and cardiovascular disease.

Characterisation of impact on food security and nutrition

	Intensity	Likelihood	Duration	Intensity	Likelihood	Duration
Positive impacts/opportunities				Negative impacts		
Food utilisation: healthy eating	No evidence identified		S to L			
Food availability: production and security	No evidence identified		S to L			S to L
Food accessibility: cost of food						S to L
Nutritional content of food	No evidence identified		No evidence identified			S to L
Food-borne Disease						Unknown

Confirmed
 Probable
 Possible
 Major
 Moderate
 Minimal
 Short term
 Medium term
 Long term

? How does climate change impact food and nutrition?

Positive impacts or opportunities

- Food utilisation: healthy eating via adoption of a more sustainable diet based on a higher intake of plant-based foods i.e. the Lancet EAT well diet
- Food availability: growth of new crops and / or new technological approaches to food production in Wales
- Food availability and biodiversity: development of sustainable food system
- Nutritional value of food

Negative impacts

- Food accessibility: cost of food and increasing food insecurity / poverty
- Food availability: supply and production
- Food safety and food-borne disease
- Nutritional value of food



Pathways of impact

- Higher temperatures
- Increased rainfall
- Reduced summer rainfall
- Water scarcity
- Extreme weather: rainfall/storms/wind
- Extreme weather: heat
- Flooding
- Sea level rise
- Psychosocial and behavioural factors

Food utilisation: healthy and sustainable diets

Stakeholders in the HIA identified that there is an increased awareness around the relationship and co-benefits of healthy eating and nutrition and taking action on climate change including; reducing emissions by lower meat consumption, increasing the production of locally grown foods and promoting sustainable diets (Int. 7, W1¹). The Lancet Commission on healthy diets from sustainable food systems concluded that *“unhealthy and unsustainably produced food poses a global risk to people and the planet”* and that *“transformation to healthy diets from sustainable food systems is necessary and possible to improve health and tackle climate change”* (Willett et al., 2019). The British Dietetic Association (2018) has also identified *“common traits between sustainable and healthy diets”* including increasing intakes of healthy plant foods and lower intakes of meat and dairy products.

Evidence from recent population surveys provide insights into the current views of the population on adoption of sustainable diets:

- 47% of adults in a UK survey said that they were fairly or very likely to eat less meat to help tackle climate change (Steentjes et al., 2020).
- 54% of consumers in a UK survey agreed that they would make changes to their diet if doing so would reduce the impact they had on climate change (Com Res, 2017).
- A recent survey in Wales found that 12% always or sometimes avoid or eat less meat and dairy, 40% sometimes do and 46% never do (Wood et al., 2022).
- 44% of respondents to the survey in Wales said they would consider eating less meat and dairy in the future, and 41% would not (Wood et al., 2022).

1 Evidence from stakeholders is referenced in the appraisal sections as W1 and W2 for insights from participatory workshops, and Int.1 etc for evidence from expert interviews.

Food availability: supply and production

Wales does not have its own separate food system. It is shaped by wider international, national and local policies such as trade, the economy and environmental sustainability which interact in a complex way and present a series of 'unknown unknowns' for policy makers and health and wellbeing (Green et al., 2021).

Potential negative impacts of climate change on food availability:

- Substantive agricultural production losses are projected for most European areas over the 21st century, which will not be offset by gains in Northern Europe (IPCC, 2022a).
- Climate change impacts on soil health have significant implications for agricultural productivity in Wales (Berry and Brown, 2021).
- A fifth of fresh produce consumed in the UK is imported from countries with increasing climate change related risks (UK Parliament, 2020).
- The proportion of fruit and vegetables supplied to the UK from climate vulnerable countries grew from 20% in 1987 to 32% in 2013 (Scheelbeek et al., 2020).
- Climate change impacts on animal health and livestock (DeFries et al., 2019; HM Government, 2015; Mbow et al., 2019), and threatens aquaculture production (Mbow et al., 2019).
- Adverse weather and natural disasters can result in supply disruption, which may lead to consumer stockpiling (Leonard and Chomthongdi, 2014). Fear can drive consumers into excessive purchasing of basic commodities, leading to empty shelves, long queues, personal stress and social tensions (Benton et al., 2012; Yuen et al., 2020).

Potential positive impacts or opportunities include:

- Some crop yields may increase due to rising temperatures, longer growing seasons and increased carbon dioxide in the atmosphere (Ballesteros Gonzalez, 2015; Houses of Parliament, 2019; Mbow et al., 2019).
- Stakeholders in the HIA identified the potential for growing new crops in Wales (W1, Int. 7), however, more education was seen as necessary on what crops to grow safely and effectively in a changing climate.
- A significant opportunity to increase the production of sustainable, local food in Wales was widely recognised by stakeholders in the HIA (W1, W2, Ints. 2, 3, 4, 7, 12).
- Local food growing was viewed as having additional positive social and health benefits e.g. social capital and mental wellbeing (Int.1).

Food accessibility: cost of food

Stakeholders in the HIA identified that challenges to food production and security arising from climate change could increase the cost of food in Wales (W2) and this is supported by the literature, as well as recent engagement and survey findings with the public in Wales:

- Climate related shocks to the international food system are becoming more likely and can lead to food price spikes, which exacerbate inequalities in access to healthy food due to income or geographical location (Challinor and Benton, 2021).
- Climate related impacts on agriculture are anticipated to increase food prices (IPCC, 2022b; HM Government, 2015; Mbow et al., 2019; Pozarny, 2016).
- 14% of people in a nationally representative survey in Wales stated that the cost of food was the impact of climate change that they were most concerned about (this was second most common concern) (Wood et al., 2022).
- Findings from place-based engagement with stakeholders and communities in Wales on climate adaptation have highlighted concerns about the availability and supply of food to the community, due to impacts on just in time deliveries and the wider impact of climate change on the local and UK food economy (Netherwood and Thomas, 2019; 2021).

Nutrition

Key potential impacts of climate change on the nutritional content of food include:

- Climate change may bring about a reduction in the nutritional quality of some food crops (Berry and Brown, 2021; Ebi et al., 2018; House of Lords, 2019; Kovats and Brisley, 2021; Mbow et al., 2019).
- Elevated carbon dioxide may contribute to faster crop growth, however, it can also reduce the protein and nutrient content of crops (Ebi et al., 2018; Hoegh-Guldberg et al., 2018; Mbow et al., 2019).
- Increased time outdoors may increase Vitamin D exposure (Kovats and Brisley, 2021).
- The introduction of new crops such as soya, lupins, borage and evening primrose may improve nutrition (Office of Science and Technology, 2019).

Food safety and food-borne disease

Climate change is predicted to become a growing risk for food safety across the UK (Kovats and Brisley, 2021) and stakeholders in Wales identify a need for improved disease surveillance linked to climate related food safety risks (Int. 3 and 4). Evidence from the literature review on this impact includes:

- Increases in extreme weather patterns, variations in rainfall and changing annual temperatures will impact the occurrence and persistence of bacteria, viruses, parasites, harmful algae, fungi and their vectors (Kovats and Brisley, 2021).
- Increasing temperatures will accelerate growth and transmission of water-borne pathogens, increasing the risk of food-borne disease (Deere et al., 2017).
- Contaminated water as a result of flooding may also impact food safety (Deere et al., 2017; Mbow et al., 2019; Kovats and Brisley, 2021).
- Food safety risks during transport and storage may also be exacerbated by climate change (Mbow et al., 2019).

The triple challenge: cumulative impacts with COVID-19 and Brexit

Diet and nutrition along with food security, food safety and standards and food production could be positively or negatively affected from all three challenges (Chang et al., 2021; Heaney et al., 2019; Green et al., 2021). The UK is currently negotiating a number of Free Trade Agreements as a result of Brexit, for example, the Common and Progressive TransPacific Partnership Agreement (CPTPP) which could have implications for diet and nutritional content. Food availability could also be impacted - from climate change policy shifts to more sustainable methods of production that can have a short-term negative impact for long-term gain, to disrupted supply chains from Brexit, the pandemic and extreme weather events affecting transportation. There are also opportunities to strengthen public health messaging around health behaviours with the increased profile of public health and environmental issues related to Brexit, COVID-19 and climate change and which tie in with Welsh Government strategies and policies such as 'Healthy Weight, Healthy Wales' (Welsh Government, 2019b) and a move to more sustainable methods of Agri farming.

The issue is complex and wide ranging and the cumulative impact of Brexit, COVID-19 and climate change on food and food security has been explored in a separate report (Green et al, 2021).



Population groups affected

- **Whole population**
- **Low-income groups**
- **Pregnant women**
- **Children and young people**
- **Older adults**
- **Farmers and fishers**



Relevant statistics

- **The UK is approximately 61% self-sufficient in all foods and 74% in "indigenous type food"** (DEFRA, 2022).
- **UK self-sufficiency has been declining for the past 30 years** (Finlay and Ward, 2020).
- **26.9 % of children aged 4 to 5 in Wales were overweight or obese in 2018/19 and rates were significantly higher in more deprived areas** (Public Health Wales, 2023).
- **35.4% of working age adults are a healthy weight** (Public Health Wales Observatory, 2022).
- **In April 2020, food bank dependence was estimated to be up by 89-175% year on year** (Chatham House, 2020).
- **10% of respondents were living in households with low or very low food security and a further 10% were classified as marginally food secure** (Food Standards Agency, 2019).
- **People living with children under 16 were less likely to have high food security than those in households without children (70% and 84% respectively)** (Food Standards Agency, 2019).
- **17% of respondents stated their household had worried in the last 12 months about running out of food and 12% stated they had experienced food running out, when they did not have the money to obtain more in the last 12 months** (Food Standards Agency, 2019).

- **Households classed as being materially deprived were less likely (34%) to buy locally-produced food than those living in non-deprived households (45%)** (Welsh Government, 2019a).
- **In 2019, there were 2,906 notifications of food poisoning in Wales, at a rate of 92.6 per 100,000 population. Significant variation exists across Health Board areas with Cardiff and the Vale University Health Board having a rate of 140.2 per 100,000 and Swansea Bay UHB at 15.7** (Public Health Wales, 2020).



Key Policy Documents

- **Healthy Weight, Healthy Wales (Welsh Government, 2019b):** aims to reduce obesity by increasing physical activity, recreation, active travel and play and access to green spaces.
- **The Food (Wales) Bill:** aims to establish a more sustainable food system in Wales to strengthen food security, improve Wales' socioeconomic wellbeing, and enhance consumer choice (Welsh Parliament, 2021a; 2021b).
- **Agriculture (Wales) Bill:** is currently passing through the Senedd with a focus on sustainable land management and a new agricultural payments system (Welsh Government, 2021a).
- **Welsh Government and Plaid Cymru Co-operation Agreement (2021):** Extends free school meals to all primary school pupils (Welsh Government, 2021b).
- **The Welsh Government Programme for Government (Welsh Government, 2021c):** this has committed to developing a Wales Community Food Strategy and a new system of farm support.

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