Figure 3.2.1b: Average delay on the Strategic Road Network in England (seconds per vehicle per mile), 2023

Source: Strategic Road Network Speed and Delay, Department for Transport,

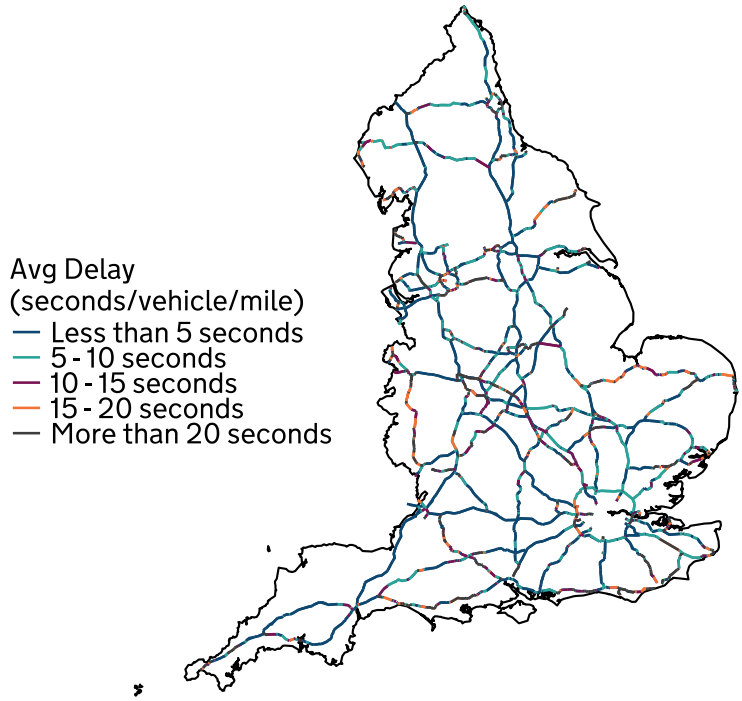


Figure 3.2.1a (see above) shows there has been a general increase in the average delay in journey time over the past three years on the strategic road network. In October 2020, the average delay was 7.2 seconds per vehicle per mile (spvpm) before rising to over 10 spvpm in October 2023. The lower delays in 2020 took place in the middle of COVID-19 lockdown restrictions. Subsequent rises in average delay following the lifting of lockdown restrictions have shown a general increase above levels before COVID-19. Average delay breached 10 spvpm in July 2023 and has continue to rise. In contrast, in the period 2015 to 2020 the average time delay fluctuated between 8 and 9 spvpm. Delays at the national level (see figure 3.2.1b) are thought to be caused by road schemes designed to maintain and enhance the SRN (National Highways - Delivery Plan 2020 to 2025). Factors include an increasing proportion of goods vehicles being speed limited in some regions and a change in driving habits.

The effect of delays is often driven at a local rather than a national level. Although not part of the SRN, the local area around Dover and Folkestone ports covers the most popular point of entry to the UK for both international and national HGVs. On the local ‘A’ roads from 2021 to 2023 there were no significant change in average delay time around the port of Dover. However, around Folkestone there were larger changes in delays leading to the port.

Supporting evidence

While the JIT inventory management model has several benefits such as being cost-effective and requiring less storage space, it raises the risk of short-term shortages from significant transport delays. Little stock is held 'on hand' by operators within the food supply chain, with stock purchased as needed. This coupled with tight timescales means it is important food-stock and other perishable goods arrive as scheduled in order to reach consumers to meet demand and limit waste.

Transport disruption could occur in a number of ways including border delays, extreme weather events, or accidental or malicious disruption affecting multiple points of the transportation network. There have been disruptions to the supply chain in recent years that were compounded by the JIT model. Consumer stockpiling during Covid-19, challenges with the UK's new trading relationship with the EU, and interruption to supply chains due to Russia's invasion of Ukraine all created temporary disruptions to the supply chain. These cases affected the range of goods available for consumer choice rather than presenting shortages in key components of the UK diet. They are indicative both of vulnerabilities that could be amplified by potential shocks, but also of the resilience of the supply chain in responding to disruptions to address shortages.

To better respond to future disruptions there is evidence of some UK businesses adopting a Just in Case (JIC) supply model. The JIC model holds some stocks as a buffer against supply chain disruptions (Jiang, Rigobon and Rigobon, 2021). However, the model presents its own limitations in terms of cost efficiencies and is not suitable for perishable items. The decision as to whether JIT or JIC is the best approach for any agri-food business will come down to individual businesses decisions. There is a data gap to illustrate the extent to which operators in the food supply chain have adopted the JIC supply model.

Climate change impacts

The effects of extreme weather on the UK transport network have been demonstrated in recent years. In 2021, Storm Arwen was one of the most damaging winter storms of the decade so far. There were a series of delays as result of severe disruption on roads, including overturned vehicles due to high winds and 120 lorry drivers were stranded overnight on the M62 due to snow accumulations (Kendon and others, 2022). In 2022 delays resulted from a 40°C heatwave caused rail disruption, associated with tracks buckling and sagging of overhead cables (Kendon and others, 2023). In 2023 seven named storms through the autumn and in December caused significant widespread disruption. Storm Babet caused widespread and severe flooding in all four nations, with red warnings of rain issued for parts of Eastern Scotland. The disruption caused by climate change is projected to worsen in the future. Hourly rainfall, seasonal storm

severity and the frequency and duration of compound wind and flood events are all projected to increase in the UK by 2100 (Met Office, 2019; Bloomfield and other, 2024).

There is an added risk from delays to perishable foods due to their dependence on the cold chain. More extreme high temperature events are likely to increase risk to the cold chain, which will require adaptation to avoid losses through spoilage and ensure food safety (Falloon and others, 2022). Refrigeration may also become more challenging with increasingly severe heat events. Numerous retail facilities experienced the failure of refrigeration systems during the 2022 heatwave (Davie and others, 2023).

3.2.2 Points of entry in the UK

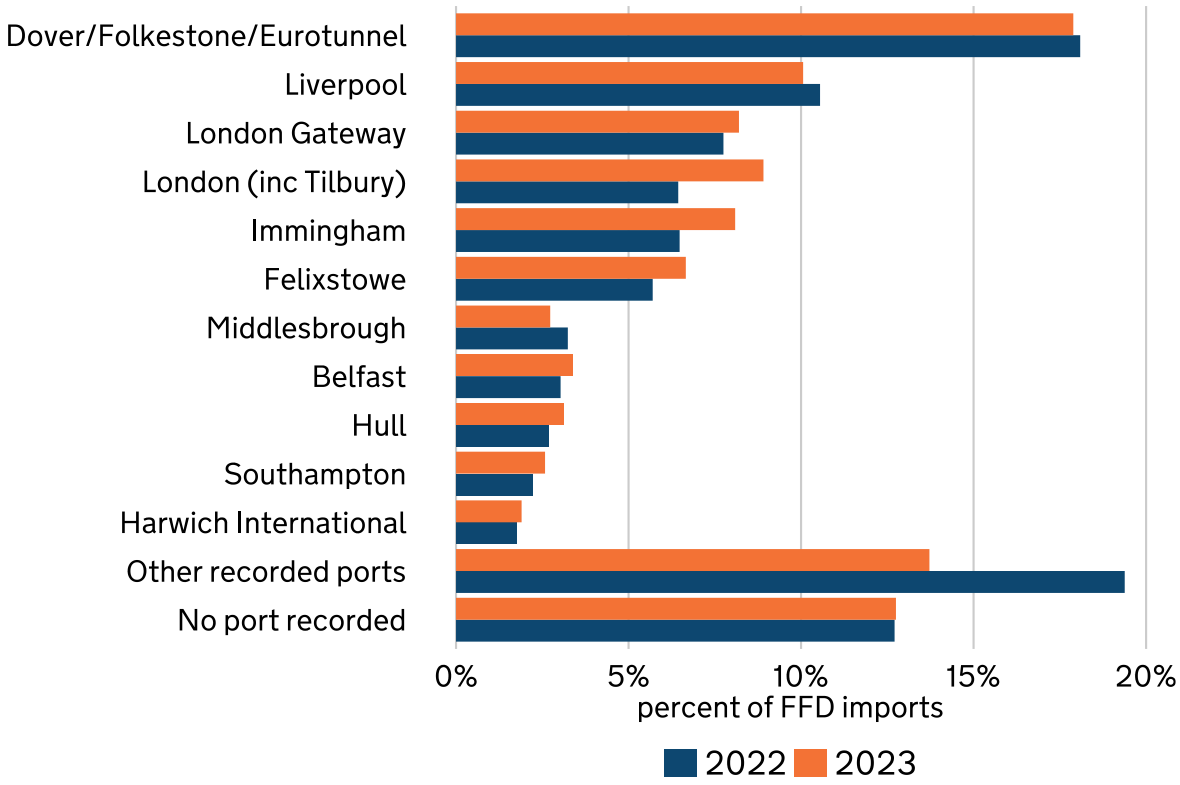
Rationale

The UK's points of entry are the places where goods enter the country from abroad. Food and animal-feed from overseas enter the country through these international gateways. In 2023 the UK relied on imports for roughly 40% of its food, unchanged from 2021. This indicator measures volumes of food and feed entering different points of entry to track the overall diversity in points of entry to the UK. This can help with understanding the UK's resilience if a disruption were to occur at one or multiple points of entry. The indicator also tracks changes in port capacity that may affect this resilience.

Headline evidence

Figure 3.2.2a: Percentage of imports of food, feed, and drink (FFD) by volume in the UK by port of entry, 2022 and 2023

Source: HMRC



Data note: Data on ports of entry for imports into Great Britain from the EU and Rest of World are available only from 2022 following the change in data collection method by HMRC. Ports of entry data remain unavailable for goods imported into Northern Ireland from the EU. Additionally, “No port recorded” includes goods arriving at freezones, inland clearance, undeclared ports, and imports into Northern Ireland from the EU.

Overall imports of food, feed and drink are spread across several major ports and a large number of smaller ports. However, some commodities are more reliant on some ports than others. The most notable case is the Short Straits (Dover, Folkestone/Euro Tunnel) where there is the most concentrated flow of food and feed and a critical dependency for entry of perishable products (see supporting evidence).

The period between 2022 to 2023 shows little overall change in the distribution of import volumes through UK points of entry. There were small increases in the proportion of foods entering through London (including Tilbury), Immingham and Felixstowe. However, with only two years of data, it is not possible to say whether these changes are beyond usual annual fluctuations.

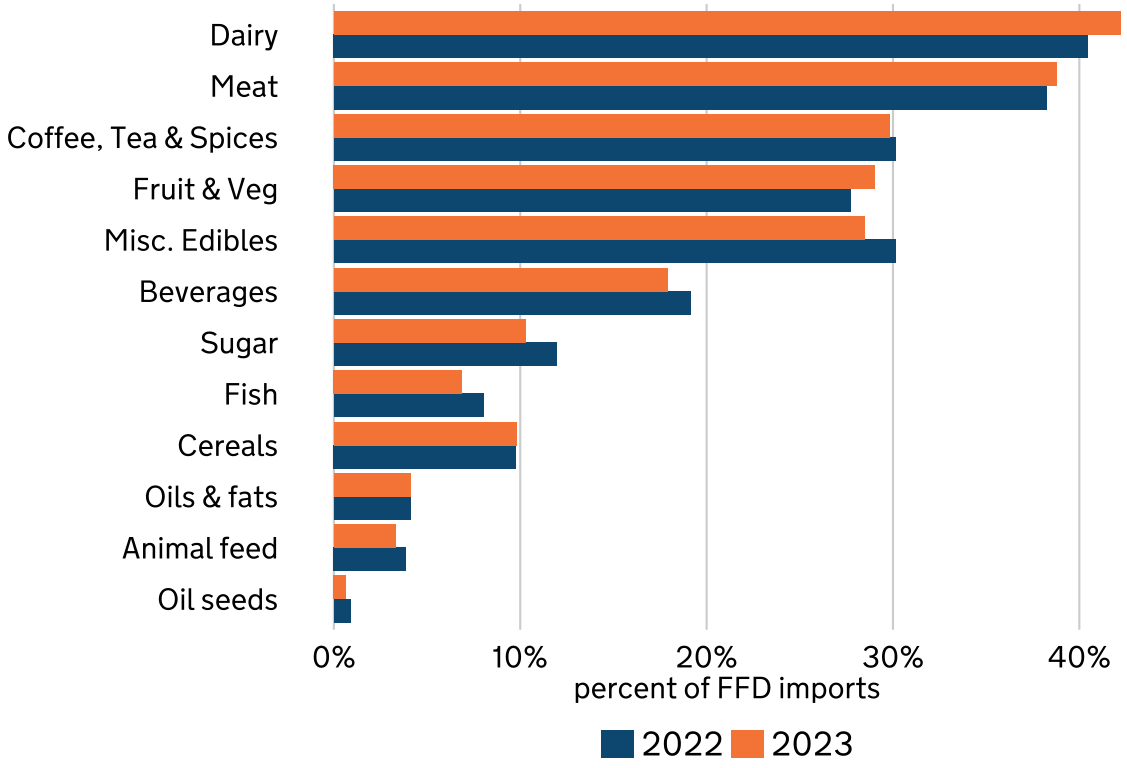
Supporting evidence

The Short Straits

The Short Strait routes refer to the ferry connections between the port of Dover, Calais and Dunkirk, and the Channel Tunnel railway connection between Folkestone and Calais. The Short Strait routes are the shortest routes from the UK to continental Europe, and offer advantages in time, cost, and frequency of services. The short journey times are particularly important for the transport of goods with a short shelf life, such as fresh fruit and vegetables. Maintaining JIT low stock levels, especially for short shelf-life products, relies on the Short Strait routes. Both the Roll-On-Roll-Off ferry services between Dover and Calais and Dover and Dunkirk and the Channel Tunnel's Freight Shuttle services between Folkestone and Calais could represent a point of potential risk if there is a disruption at the ferry or rail terminals (Zurek and others, 2022).

Figure 3.2.2b: Proportions of the volume of UK food, feed and drink imports that are recorded as entering the UK at Dover, Dover/Eurotunnel, or Eurotunnel (Folkestone), 2022 and 2023.

Source: HMRC



On average, 18% of the total volume of UK Food, Feed and Drink imports are recorded as entering the UK through the Short Straits. The average is greater for perishable products such as **dairy** and **eggs** (42% in 2023), **meat** (39% in 2023) and **vegetables** and **fruit** (29% in 2023) which require faster transit times to

ensure that products reach consumers as quickly as possible (see figure 3.3.2b above). Products such as cereals and oilseeds tend to be transported in bulk, requiring different specialised port facilities. The majority (62%) of imports of fish and fish products are recorded as entering through Immingham, Felixstowe, and London Gateway. This route is also important for UK exports, with approximately 52% of meat and 50% of fish exports (by volume) going to continental markets through this route in 2023.

Port capacity

Managing risk of disruption by having a diversity of ports is dependent on the capacity of ports to receive rerouted goods. Resilience may be stronger where there are clusters of ports (such as in the South East and North East regions) used for handling food import traffic, where geographical proximity may allow ports to share some of the risks of disruption. However, there continues to be an evidence gap at both the individual port and UK level to allow for an accurate assessment of the ease with which food import traffic can be switched between ports in the event of disruption. Generally, ports mitigate any risks by operating a long-term supply model and planning well in advance to avoid potential disruption. The ability of ports to take on additional short notice shipments will be determined by a number of factors including utilisation levels, the availability of trained people in place to accommodate increased traffic flow, the ability of industry to reconfigure their supply chains and the infrastructure available at the port.

Shipping

The Poole-Tangier route discussed in UKFSR 2021 is still in development. Since 2021 there have been several new shipping routes established. New shipping routes are designed to expand the diversity of choice for traders and hauliers and to build supply chain resilience in the routes between the UK and other countries. There is limited data available on the mode of transport for goods entering the UK or the extent that new routes will be used in the food supply chain. Notable developments are new routes from South America that will transport bananas to Southampton and frozen food to London Gateway and a new route from Agadir to Liverpool that will transport tomatoes.

Shipping disruption between 2021 and 2024

Global disruptions to shipping such as **Russia's invasion of Ukraine** and the attacks on shipping in the **Red Sea** (Strait of Bab al-Mandab) have affected the movement of goods. These disruptions occurred within the context of challenges already experienced by UK traders following the UK leaving the EU. The disruption in the Red Sea and Black Sea at a global level is covered in more detail in Theme 1 (see Indicator 1.3.3 for a case study on the role of maritime trade chokepoints in global food security). From a UK perspective, the disruptions primarily affected

prices, rather than supply. Global trade was diverted via The Cape of Good Hope, adding 10 to 20 days to shipping times, increasing transportation costs. The ability shown by traders to adjust to localised disruption by choosing alternative routes demonstrated some resilience in the supply chain.

The figures below set out global maritime chokepoints for important food imports and inputs to food production. While traders can find different routes in cases of disruption, the effects of disruption will depend on the level of concentration for different goods. Soybeans and rice passing through the Strait of Malacca and Phosphatic fertiliser passing through the Strait of Gibraltar show notably high levels of concentration. There is an evidence gap on implications of these chokepoints for UK supply.

Figure 3.2.2c: Annual maritime chokepoint throughput of maize, wheat, rice, and soybean as a share of global total trade, 2022

Source: Chatham House Maritime Analysis Tool; Chatham House (2022), resourcetrade.earth (2022 data)

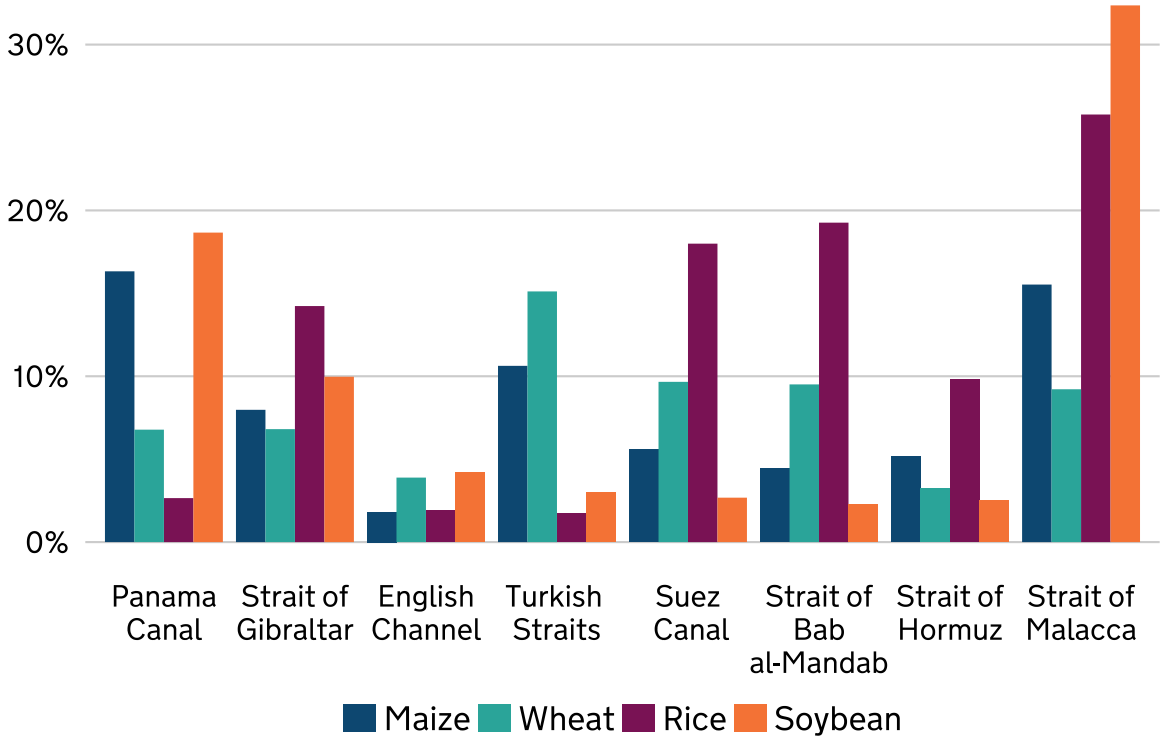
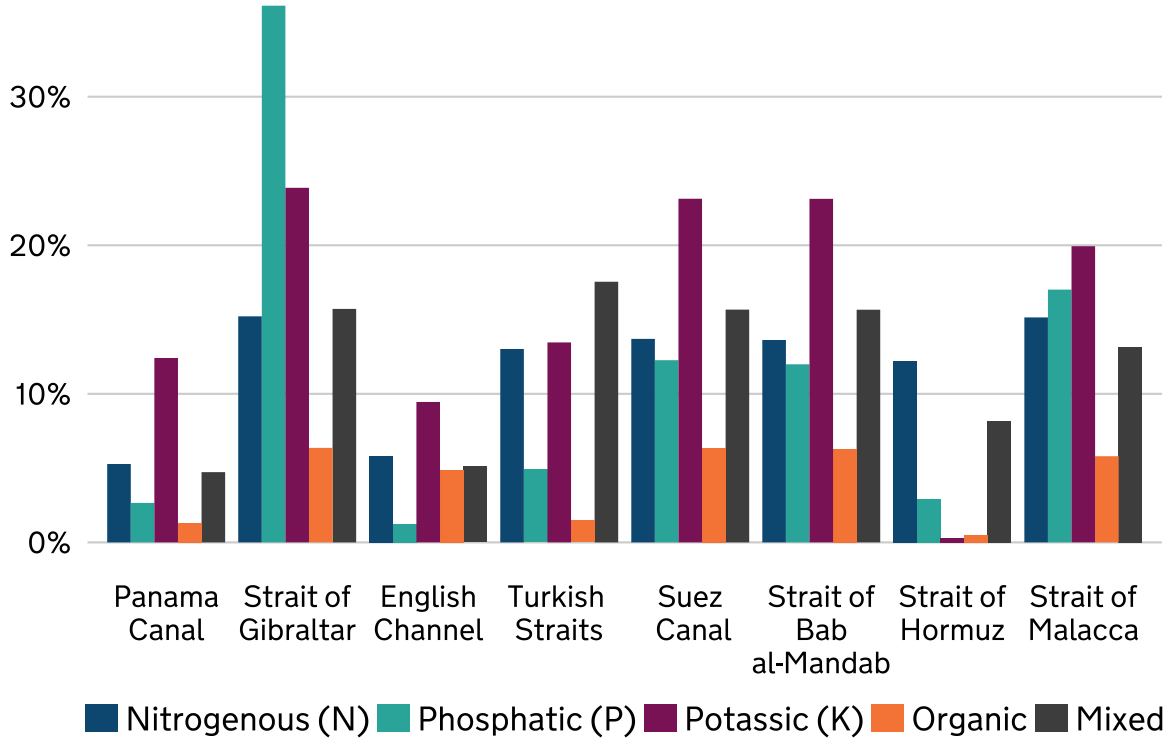


Figure 3.2.2d: Share of global trade in fertilizers passing through key maritime chokepoints, 2022.

Sources: Chatham House Maritime Analysis Tool; Chatham House (2022), resourcetrade.earth (2022 data)



Climate change impacts on UK ports

Climate change is expected to increase extreme weather events that could affect the functioning of ports. A notable recent example affecting ports was the 2022 February storms which led to the temporary closure of the port of Dover to all shipping (Kendon and others, 2023). Storm surge events of magnitudes that have previously occurred in the UK are expected to affect larger areas of land in the future due in part to higher mean sea levels (Bulgin and others, 2023). The pattern of sea level rise is not uniform across the UK. The largest increases are projected for the southern UK (close to the global mean), while projections are much lower for northern parts of the UK (Met Office, 2022). Areas along the east coast, through the English Channel to north Devon are expected to experience the most significant increases in coastal risk based on sea-level rise and changing frequency of weather patterns (Perks and others, 2023). Government, ports, and many businesses have plans to reroute goods to other ports in this event, but the combined effect of rerouting all east coast traffic would likely cause delays and congestion at other ports. The JIT model of the supply chain makes it vulnerable to this kind of disruption, with the greatest potential effects on availability of fresh produce. The projected opening up of Arctic sea routes offers opportunities for increased trade for the UK (Challinor and Benton, 2021), which could potentially

increase resilience by diversifying the options available for shipping routes for imports and exports.

3.2.3 Import flows

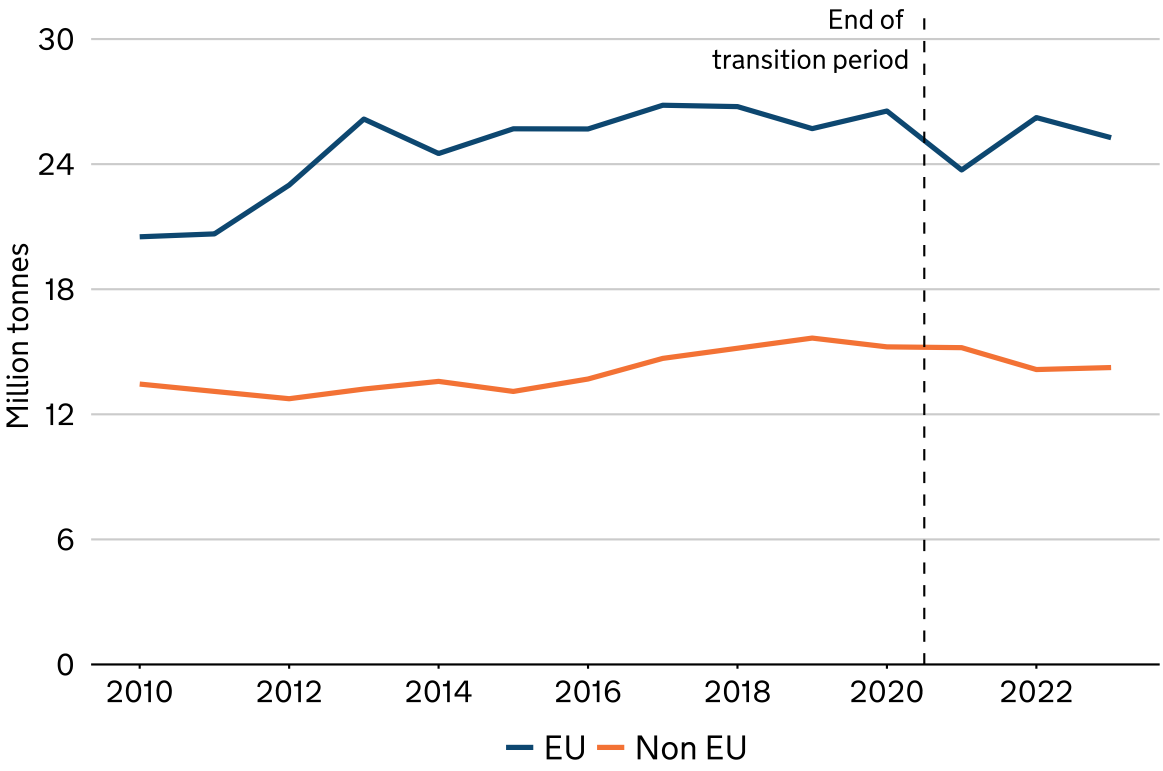
Rationale

The ability of food to enter the UK is an important consideration for stability of the supply chain. This indicator tracks the volume of food, feed and drink feed imports into the UK to assess the stability of that flow and the effect of any disrupting factors or barriers to trade.

Headline evidence

Figure 3.2.3a: The volume of UK imports of agri-food (food, feed and drink), 2010 to 2023, MT

Source: HMRC



Data note: Changes to data collection for EU to GB imports in 2021 and 2022 (including the impact of staged customs controls), mean that recorded imports may be lower than expected in 2021 and may be overstated in the first six months of 2022.

The total volume of imports of food, feed and drink (FFD) entering the UK has tended to reduce slightly between 2018 and 2023.

In 2023, the volume imported from both the EU and Non-EU countries was 6% lower than in 2018. While there was a sharp fall in imports from the EU in 2021, immediately after the end of the transition period for leaving the EU, these imports have since increased slightly, and the EU remains the UK's largest external supplier of food. In 2023, the EU accounted for 64% of the volume of UK imports.

Changes to trade flows, cannot be attributed to a single cause. The combined effects of COVID-19 national and international lockdown restrictions, border disruptions and changes to trade with the EU following the transition period and, implementation of The UK-EU Trade and Co-operation Agreement (TCA) have all contributed to changes in UK and global trade including the sharp fall in EU food and feed imports in 2021. These and other factors will have an effect over a longer period.

Supporting evidence

Changes to EU imports

Goods between the EU and the UK were previously under the same customs arrangement. There was therefore no requirement for traders to complete sanitary and phytosanitary (SPS) and rules of origin (RoO) checks and documentation. The UK-EU Trade and Cooperation Agreement set out the terms of UK trade with the EU from 1 January 2021, allowing zero tariffs and quotas on goods moving between the EU and the UK provided those goods meet the RoO. From 2021 imports from the EU are required to adhere to RoO measures.

GB goods exported to the EU are also subject to third country customs and SPS regimes. In comparison the UK Government has been phasing in border controls for goods imports from the EU since 2021. Customs declarations are now required for all imported goods and businesses must pre-notify imports of animals, plants, and high-risk food and feed. Additionally, certain high-risk animals and plants require health certificates and checks. The planned introduction of the remaining controls has been postponed. These include health certification and SPS checks on all agri-food products, physical SPS checks on EU imports at designated Border Control Posts, and safety and security declarations (House of Commons Library, 2023).

In August 2023, the UK government published its 'Border Target Operating Model' (BTOM), which set out the government's plan for introducing new rules and processes for imports into Great Britain, including from the EU. The BTOM has been gradually introduced over the course of 2024. The BTOM is designed to make better use of technology and data to reduce friction and the cost of border controls for businesses and consumers. This new approach has brought in biosecurity and food safety controls for goods coming from the EU, and uses a

global risk-based model, data, and technology with the intention to reduce the burden on businesses while protecting consumers.

For high-risk and medium-risk goods, the BTOM retains health certification and border control post (BCP) inspection, albeit with frequently lower inspection rates than under the EU model. Documentary-only checks are performed remotely instead of all regulated goods having to present documents at a BCP. For low-risk animal products as a matter of routine the UK only requires electronic pre-notification. Low-risk plant produce (fruit and vegetables with no known specific disease or pest risk associated) have been removed from import health control requirements altogether. There are also no longer requirements for pre-notification, with enhanced inland monitoring and surveillance in place to monitor compliance with the UK's food safety and standards and to keep track of any issues. The Safety and Security import controls model under the BTOM is designed to minimise trader burdens and maintain border security while remaining aligned with international standards.

The UK has been a longstanding net importer of food. Although global prices drive the cost of imports, import requirements at the border contribute to the overall cost of imports. These requirements include tariffs, complying with sanitary and phytosanitary (SPS) and rules of origin (RoO) measures and other technical barriers to trade. There may therefore be a risk where increased frictions as a result of changes to border controls with the EU interact with wider inflationary pressures, leading to price increases. Modelling suggests that the effect of the new border model on the costs of food and drink will not be significant, representing less than a 0.2 percentage point increase e in total over 3 years. The consequences of a major outbreak of a human, plant or animal disease on the economy could be far more severe.

Data on UK border control from the Border Target Operating Model (BTOM) was not ready to be published in this UKFSR.

NI-GB border Changes

From 2021 to 2023, the flow of goods between Northern Ireland (NI) and Great Britain (GB) were subject to the Northern Ireland Protocol. In February 2023, the UK and EU agreed the Windsor Framework, which provides a new set of arrangements to support the flow of trade within the UK internal markets. Regulatory divergence between the EU and the UK affecting trade has been limited to date. The Windsor Framework contains mechanisms to monitor and manage regulatory divergence as it emerges to limit the effect of future EU and UK rules changes on flow of trade. These include the Joint Consultative Working Group structured sub-group on agri-food and the new Special Goods Body. Risks to NI food supply are offset to a degree by smooth access to the EU market. There is currently a data gap to show trade flows at a product level between NI and GB.

Sub-theme 3: Food business

3.3.1 Cyber security

Rationale

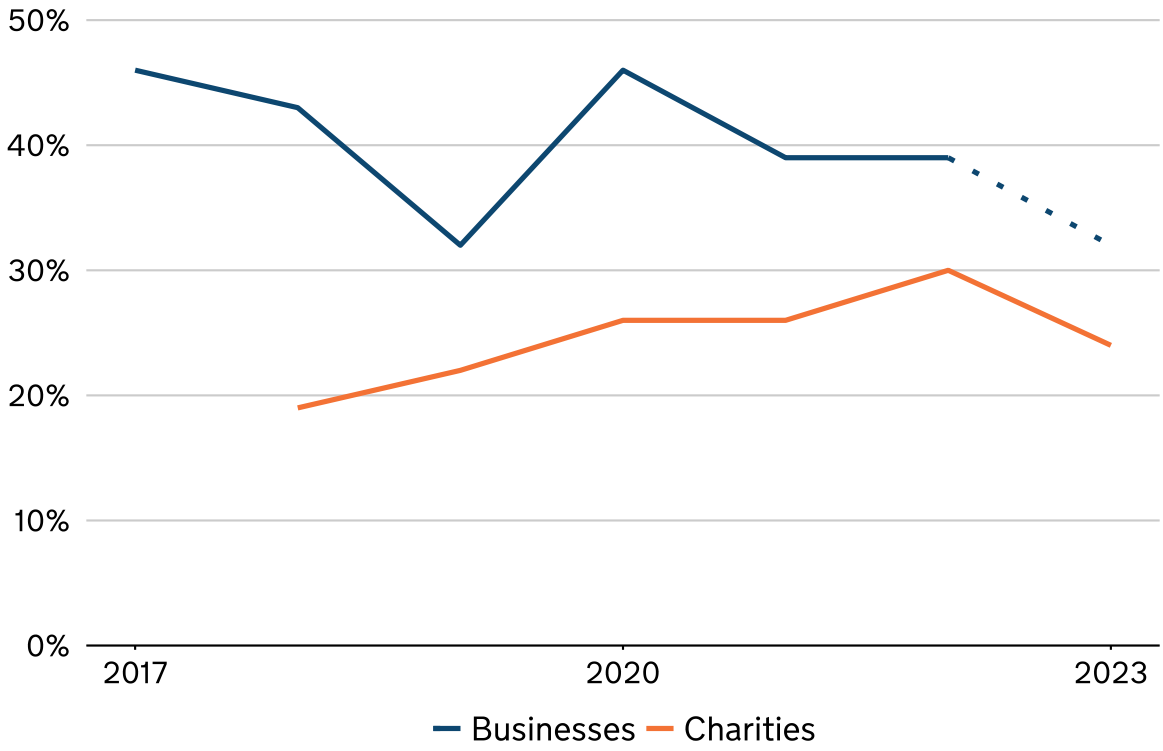
Cyber-attacks can target any point within the food system and other interlinked systems (such as water, energy, transport) with a multitude of end goals. They present potential disruption to the supply chain which poses a risk to food availability. Attacks may affect the ability of businesses to buy goods and services, move resources between locations, or sell goods and services. They can come in the form of espionage, hacktivist attacks, phishing, insider threat, ransomware, or another other type of criminal activity targeting the operations of a business.

This indicator uses government data to give high level picture of the risks to cyber security. The UK government is constantly reviewing the risk of cyber-attacks to the food system. The Cyber Security Breaches Survey gathers data on cyber breaches and attacks to give an overview of national cyber resilience. Reporting cyber breaches is not mandatory and the data available is not broken down to show a food system specific picture. The survey was first published in 2017.

Headline evidence

Figure 3.3.1a: The percentage of organisations identifying cyber breaches or attacks, in the UK, 2017 to 2023

Source: Cyber Security Breaches Data Survey 2023, Department for Science, Innovation and Technology, Figure 4.3



Note:

1. 1000 UK businesses per year; over 300 charities per year the weighting approach for businesses was changed for 2020, although this is expected to have a negligible effect on comparability to previous years.
2. The sample frame for businesses was changed in 2023, although it is still intended to produce a representative sample of businesses. A dotted line has therefore been used for 2023 business trends.

There has been a decline in the proportion of businesses and charities reporting any breaches or attacks. In 2023, 39% of Businesses reported any breaches or attacks, compared to 32% in 2022 and 39% in 2021. This is a continuation of a downward trend since 2017, with the exception of 2019. 2023 was also the first year the number of charities reporting any breaches or attacks reduced, decreasing from 30% in 2022 to 24% in 2023.

The decline in breaches or attacks identified in the Cyber Security Breaches Survey is driven by micro and small businesses, down respectively from 36% and 48% in 2022, to 31% and 32% in 2023. The results for medium and large

businesses are not significantly different from 2022. Standing at 59% for medium businesses and 72% for large businesses in 2022, and 59% and 69% respectively in 2023. This suggests that it is medium and larger businesses that are likely being targeted. However, there are a range of possible reasons for long term decline. For example, due to the self-reported nature of the data, smaller businesses may lack the resources to participate in the survey.

Supporting evidence

Although the UK has seen a decline in reported cyber security breaches in the recent term, increased use of technology in agriculture is presenting new risks to security through threats such as malicious use of Artificial Intelligence (AI) and ransomware attacks.

Cyber security remains the responsibility of each actor within the supply chain. In the 2023 Annual Review, The National Cyber Security Centre (NCSC) highlighted a number of threats that may change the wider UK threat landscape, including malicious use of artificial intelligence, stating the following:

"Our adversaries – hostile states and cyber criminals – will seek to exploit AI technology to enhance existing tradecraft. In the short term, AI technology is more likely to amplify existing cyber threats than create wholly new ones, but it will almost certainly sharply increase the speed and scale of some attacks. There is now a significant amount of activity across the NCSC and wider government to assess and respond to the potential threats and risk posed by AI."

The review also highlighted the risk from attacks via ransomware. Ransomware attacks make data inaccessible to the victim and/or their operating systems inoperable, until a ransom is paid. The now-normal approach of stealing and encrypting data continues to be the primary tactic that cyber criminals use to maximise profits. However, data extortion attacks, in which data is stolen but not encrypted are a growing trend in the threat landscape. Additionally, some groups will encrypt data, and then threaten to leak the data as an escalation of the attack. NCSC guidance recommends that all UK organisations take steps to protect themselves from this and other threats.

A NCSC assessment using the Professional Head of Intelligence Assessment (PHIA) Probability Yardstick shows that it is almost certain (95 to 100% probability) that ransomware is the greatest disruptive threat to the food sector as it can be targeted at almost all levels of the food supply chain. It is also highly likely (80 to 90% probability) that the increased connectivity in the agri-food sector makes it a more accessible and therefore a more attractive target for threat actors. It is also likely (55 to 75% probability) that threat actors see the agri-food sector as particularly vulnerable to disruption or extortion due to its tight production timescales and reliance on high productivity during particular seasons. An

example of a potential new threat by cyber-attack to the agri-food sector since 2021 is the bricking of tractors used as a defensive tactic during Russia's invasion of Ukraine.

3.3.2 Diversity of food retailers

Rationale

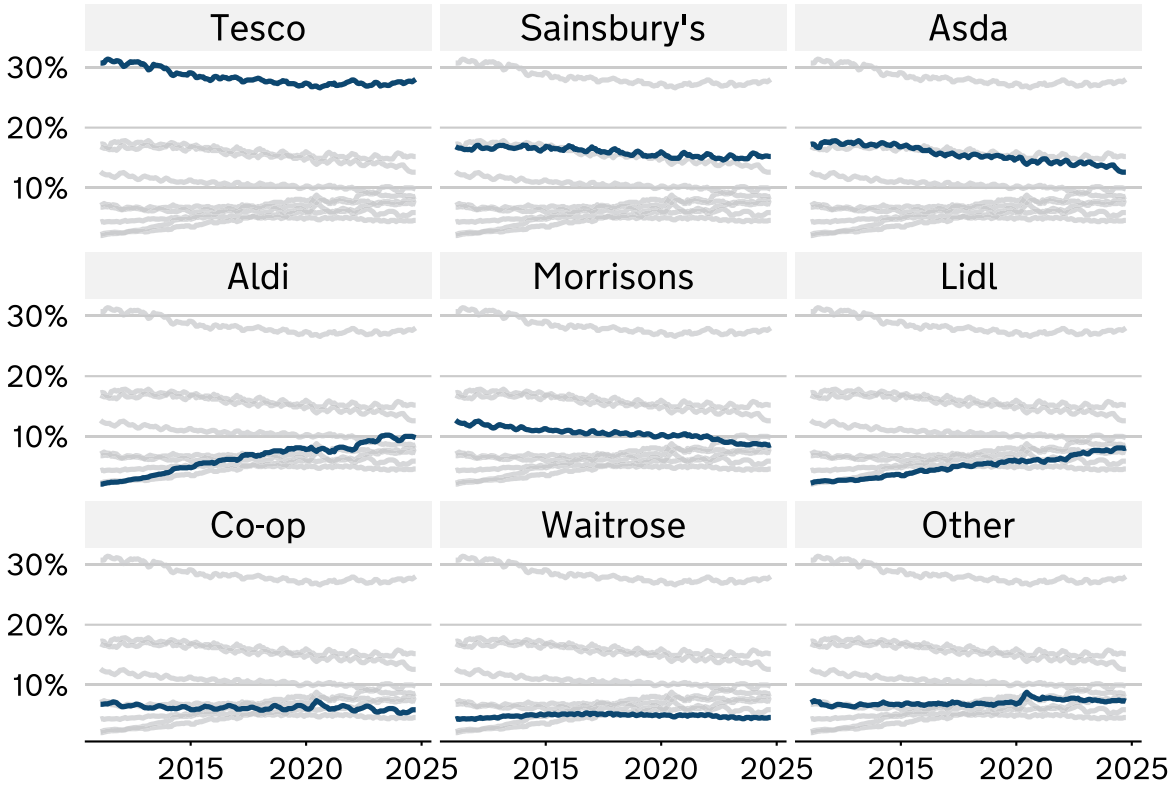
In the UK most of the population access food from the national network of food retailers. Retailers are a key link between producers (farmers, fishers, manufacturing, importing), intermediaries (such as wholesalers), and consumers.

The diversity and size of the food retail sector ensures its resilience; no individual retailer is responsible for feeding the nation. Additionally, by having a spread of retailers, this ensures that consumers have agency within the food system by giving consumers some control of where they procure their food. This indicator tracks diversity of retailers by analysing changes in retailers' market share. It also considers consolidation and diversity in the wider food sector in the supporting evidence. Alongside retailers, convenience stores allow for greater access to food.

Headline evidence

Figure 3.3.2a: Grocery market share, Great Britain, 2011 to 2024

Source: Kantar Worldpanel



The most notable trend in the retail landscape in the last decade has been the increase of market share for 'discount' retailers, notably Aldi and Lidl. Their respective market share has both increased from around 2% in 2011 to around 10% (Aldi) and 8% (Lidl) respectively in 2023. This has generally been at the cost of the biggest four retailers. However, market concentration has not changed greatly. Kantar market share data is for Great Britain only. The combined market share of the largest four food and drink retailers in GB accounted for about two thirds of the overall market in 2024, unchanged from 2021. The top four companies were different, with Aldi replacing Morrisons at number 4. Tesco continued to command the largest market share at 27.9%. In Northern Ireland, Tesco, Lidl, Sainsburys and Asda are the main companies in food retail with Tesco also holding the largest share of the market.

Comparatively high levels of concentration in the UK agri-food supply chain have created some wider concerns about effective competition and effect on consumers, following the rise of food prices since Covid-19. The Competition and Markets Authority (CMA) conducted analysis in 2023 and 2024 to determine whether any failure in competition was contributing to prices being higher than they would be in a well-functioning market. The CMA concluded that they did not find widespread evidence of weak competition between retailers contributing towards higher food prices during recent times of disruption.

Supporting evidence

Wider retail sector

Throughout the UK there are other outlets (1.8% of market share) and independents (1.5% of market share) who provide consumers with access to alternative supply chains. For example, there are box schemes with a focus on UK-grown produce and/or short supply chains and Community Supported Agriculture. These direct sales can provide an alternative retail route for UK producers.

Convenience stores continue to be a fundamental part of food shopping for many people, especially in rural and suburban areas. A convenience store is defined as any retail premises that is under 3000 square feet in size. According to the Association of Convenience Stores (ACS) 2024 report, the convenience store sector has expanded considerably in the last 10 to 15 years, primarily due to supermarket entry and expansion. The majority (around 70%) of convenience stores are independently owned or operating under a symbol group (such as Nisa). These stores represent a lower share of sales volume (CMA, 2023). The role of convenience stores in offering additional access to food for consumers was demonstrated during Covid-19 (Rybaczewska, Sulkowski and Bilan, 2021).

At the same time, the food retail landscape has been transformed by the emergence of online food retailers like Ocado (1.9% of market share) and Amazon Fresh. In 2023, an estimated 11.2% of all UK grocery sales were completed online (Mintel, 2024). Although this figure is slightly down from its peak during lockdown restrictions in 2021, it represents a significant increase from pre-pandemic levels and reflects how consumers have diversified their shopping habits. The physical and digital access to food shops is covered substantially in Theme 4 (see Indicators 4.2.1 Physical access to food shops and 4.2.2 Online access to food shops).

Consolidation

Diversity is important to food security across the food system; a concentration or hot spot at any point in the supply chain presents a potential vulnerability, whether through cyber-attacks, climate change or other factors. While there is risk in concentration, there are also some benefits. Large retailers in the UK benefit from economies of scale, greater infrastructure, and access to resources, which can give them flexibility in response to shocks and mean that they are less likely to go out of business. Similarly, consolidation in the food manufacturing sector has also generated benefits, with larger companies better positioned to invest in innovations and technology to increase efficiency.

Consolidated sectors may facilitate an imbalance of market power. Some market actors can strongly influence the terms of trade with other market actors, affecting the prices paid for commodities (Clapp, 2022). Concentration also affects consumer choice. Often the products that appear in food retail are similar because different brands are owned by the same food processing conglomerates. Equally, large food retailers typically own multiple grocery chains within concentrated domestic markets, giving the false appearance of choice to consumers (Clapp, 2022). There is limited public data on levels of consolidation in the intermediate stages of the supply chain, such as food processing and manufacturing.

3.3.3 Business resilience

Rationale

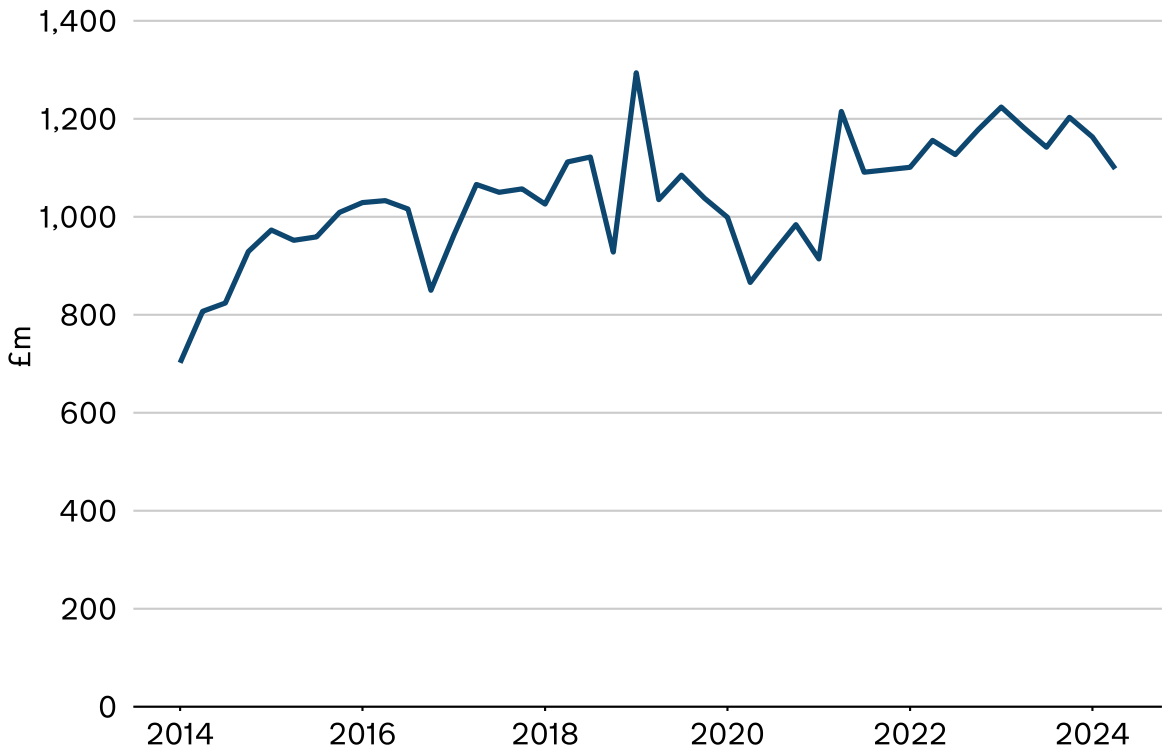
Significant parts of the food supply chain are owned and operated by thousands of private businesses. The food supply chain is therefore dependent on the economic and financial health of food businesses that allows them to survive and adapt through shocks and be prepared for future risks. Over the long-term business health can help businesses invest and be prepared for future risks, whereas business uncertainty and low confidence can be a barrier to making changes towards greater resilience and sustainability – what has been called a food system ‘lock-in’. There is no single metric for business stability and resilience. Consequently, this indicator tracks various statistics both at the micro (firm) level

and the macro (economy) level. These include the level of business investment, the entry and exit of firms in the food sector, total factor productivity, farmer income and confidence.

Headline evidence

Figure 3.3.3a: Business investment quarterly figures (real value) – food, drink, and tobacco, UK, Q1 2014 to Q2 2024

Source: ONS, 2024



Note: Chained volume measures (CVM) show real terms value of quarterly business investment in food, drink, and tobacco from 2014 to 2024. This removes the effect of inflation. Tobacco is minimal, representing about 4% of the total.

Business investment means net capital expenditure by businesses, including spending on machinery, building work, transport equipment and computer hardware. Investment is an indicator of businesses confidence in future viability and opportunities to grow, while low investment indicates low business confidence and uncertain conditions. Investment levels can also indicate the extent to which businesses are taking steps to ensure future resilience and preparedness for risks.

From 2014 to 2019, investment levels in food, drink and tobacco generally increased, with the exception of 2016 (EU referendum), where they dipped. Investment levels recovered and reached their highest point in 2019 (£1.294m), before dropping to £866m in 2020 following COVID-19. Investment levels

increased again in 2021 to £1.215m and then fluctuated in 2021 and 2022 during the period of the UK leaving the EU and Russia's invasion of Ukraine. In 2023, business investment trends suggested a broadly stable picture, with total investment increasing by 5.7% in 2023 compared to 2022. Investment levels as of quarter 2 in 2024 remain lower than pre-2021 levels suggesting that the sector is still recovering.

The dips in investment levels correspond with the effects of shocks and could explain the subsequent uncertainty they caused. Although investment has remained below pre-disruption levels, the trend of recovery following each period of uncertainty indicates some resilience within the food supply chain. Industry reports suggest that uncertain economic conditions may deter future investment. The increased need to respond to short term shocks risks diversion away from investing in long-term resilience to international market competition and shocks. Long term investment may build capacity and flexibility in manufacturing supply, to bolster the sector's resilience (OECD, 2024).

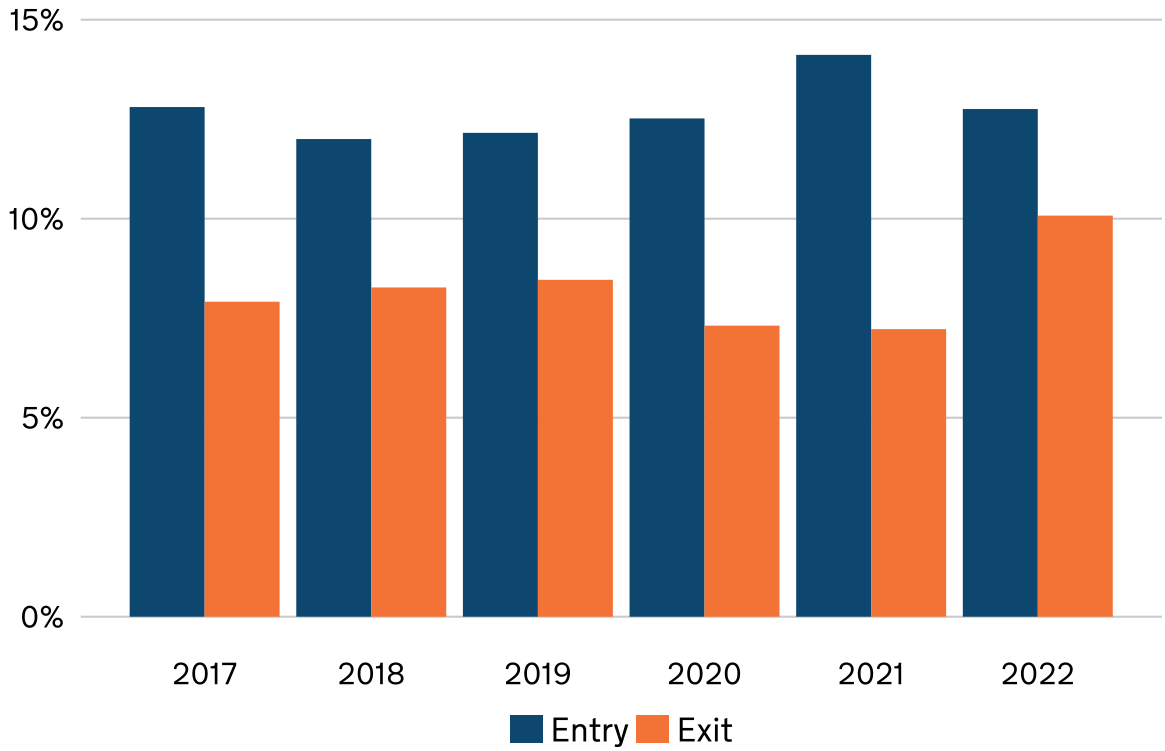
The World Economic Forum Global Risk Perception Survey 2023/2024 Survey gives an indication of the risks which businesses perceive in the short and long term, which may be affecting levels of confidence. The 2023/2024 survey results suggest that misinformation and disinformation are perceived as the risks which are most likely to have an effect in the next 2 years. Economic risks were also prevalent in the top ten short term perceived risks, with inflation (number 7) and economic downturn (number 9). Over the longer term the perceived risk landscape changes. In the next 10 years environmental and technological risks are among those expected to worsen, with all environmental risks such as extreme weather (number 1), critical change to earth systems (number 2), biodiversity loss and ecosystem collapse (number 3) and natural resource shortages (number 4) ranked in the top 10 perceived risks.

Supporting evidence

Business entries/exits

Figure 3.3.3b: Entry and exit of firms as percentage of firms in the Food and Drink Manufacturing Sector, UK, 2017 to 2022

Source: ONS Business Demography



As with investment, the entry and exit of firms in a sector can give an indication of business confidence, as well as competitiveness and economic stability. In combination, high levels of entry and of exit can be indicative of a highly dynamic and competitive sector. It suggests that positive prospects are incentivising companies to enter the sector, and at the same time high levels of competition are pushing poor performers out of the sector. Elevated levels of business exit without elevated business entries births could indicate poor business performance. Elevated business birth without elevated exits could indicate high business confidence and economic stability because of the inherent risk of starting a new business, but the lower exits could signal weak competition.

Figure 3.3.3b above shows the entry and exit rates of firms in the Food and Drink Manufacturing sector (FDM) from 2017 to 2022. The data suggests that the sector is highly dynamic and competitive, with high levels of entries and exits. Furthermore, business birth rates have consistently been above death rates, and the FDM sector appears relatively healthy in terms of business demography compared to other sectors of the economy. The business birth rate for FDM stood

at 12.8% in 2022, which was higher than the UK average of 11.5%, and the business death rate was lower than the UK average at 10.1% compared to 11.8% (ONS, 2021). 2020 and 2021 were two years of decline in business death rates, which could reflect the financial support offered by the government during the Covid-19 pandemic. In 2022 there was an increase in business exits, which may reflect effects from the spike in input prices. As a result, the gap between entry and exit narrowed substantially in 2022.

Overall, the persistent high levels of entries as well as the healthier performance (in terms of business demography) compared to other sectors, and the high levels of churn (firm turnover) suggest that FDM continues to be an attractive, competitive, and dynamic sector for businesses. Yet, the trend in death rates seems to show vulnerabilities to shocks and uncertainty within the sector. Vulnerability is further suggested by the number of food manufacturing insolvencies increasing from 75 in 2017 to 190 in 2023, while drink manufacturing insolvencies increased from 23 to 85 over the same period.

Total factor productivity

Total factor productivity reflects the sector's ability to adapt and innovate to enhance efficiency. It is also explored in Theme 2 (see Indicator 2.2.3 Agricultural productivity). The statistic is a measure of relative efficiency of converting inputs to outputs (through, for example, new product development). Maintaining and recovering productivity during and after shocks to the sector indicates business resilience. Additionally, productivity growth in the food sub-sectors can be a catalyst for economic growth by ensuring an enabling environment for private sector investment.

Figure 3.3.3c: Total factor productivity in the food chain, in comparison to the wider economy, UK, 2000 to 2022

Source: Food chain productivity, Defra

Figure 3.3.3d: Total factor productivity across the different sectors of the food chain; agriculture, manufacturing, wholesale, catering, retail. UK, 2000 to 2022

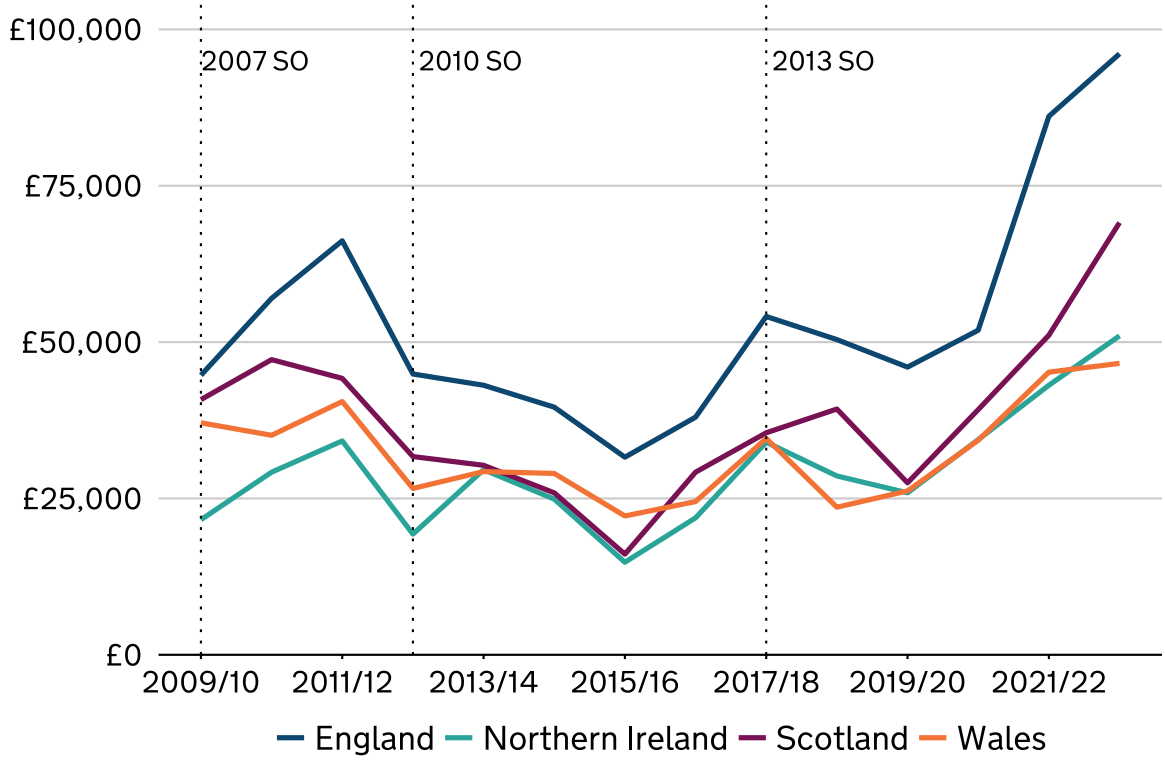
Source: Food chain productivity, Defra

Figure 3.3.3c above shows a general upward trend in total factor productivity (TFP) in the last 10 years for both the food chain and wider economy. Productivity fell in 2014 due in part to declines in the manufacturing and retail sector, and in 2020 due to the Covid-19 pandemic which affected the catering sector heavily. In 2022, the productivity of the food chain increased by 2% from 2021 while the productivity of the wider economy increased by 2.6%. Both index values demonstrate recoveries since the end of the Covid-19 pandemic. In the 10 years prior to 2022, the average annual growth rate of the food chain was 0.8% while the wider economy's average annual growth rate was 0.4%.

Figure 3.3.3d above shows that since 2020 the productivity of all sectors has grown at varying rates. All sectors with the exception of retail and wholesale experienced a dip between 2019 and 2020 following Covid-19. Catering was particularly affected. Following the dip in 2019 and 2020, the productivity of disrupted sectors bounced back to pre-2019 levels. In contrast, retail sector TFP increased in both 2020 and 2021 before falling slightly in 2022 (down 0.6%). TFP of the agricultural industry in the UK decreased by 5.1% between 2022 and 2023. This was driven by a decrease in the volume of outputs and a slight increase in the volume of inputs. TFP for agriculture is covered in Theme 2 (see Indicator 2.2.3 Agricultural productivity).

Farm business Income

Figure 3.3.3e: Farm Business Income by UK country, all farms, 2009/10 to 2022/23
Source: UK Farm Business Surveys



Note:

1. The Farm Business Survey does not include farms below a threshold of €25,000 for England, Scotland, and Wales. For Northern Ireland, the threshold is €15,000.

2. Additionally, for Northern Ireland, results are presented for farms with a Standard Labour Requirement of at least 0.5 (see glossary).

3. The breaks in series indicate changes in the Standard Output (SO) coefficient base years.

Farm Business Income (FBI) is the output generated by the farm business minus total farm costs. Figure 3.3.3e above shows that farm business income in the UK has generally increased over since 2009/10, with the largest increases in England and Scotland. However, this has not been a stable trajectory. In some years income decreased across the UK by notable proportions in the range of around 5 to 30%. For example, in 2012, extremely poor weather affected food production across the UK, leading to lower outputs and therefore lower overall FBI. 2021 showed a sharp rise in FBI across the UK due to a range of factors for example, improved return on agricultural activities in England, favourable growing conditions in Wales and higher output prices in Scotland and Northern Ireland. The most recent data for 2022/2023 (not in the chart) shows a mixed picture.

Figure 3.3.3f: Average Farm Business income (£ per farm) on cropping farms by cost centre, (real terms), England 2021/2022 to 2022/2023

Source: Monitoring the agricultural transition period in England, 2022/23, Defra

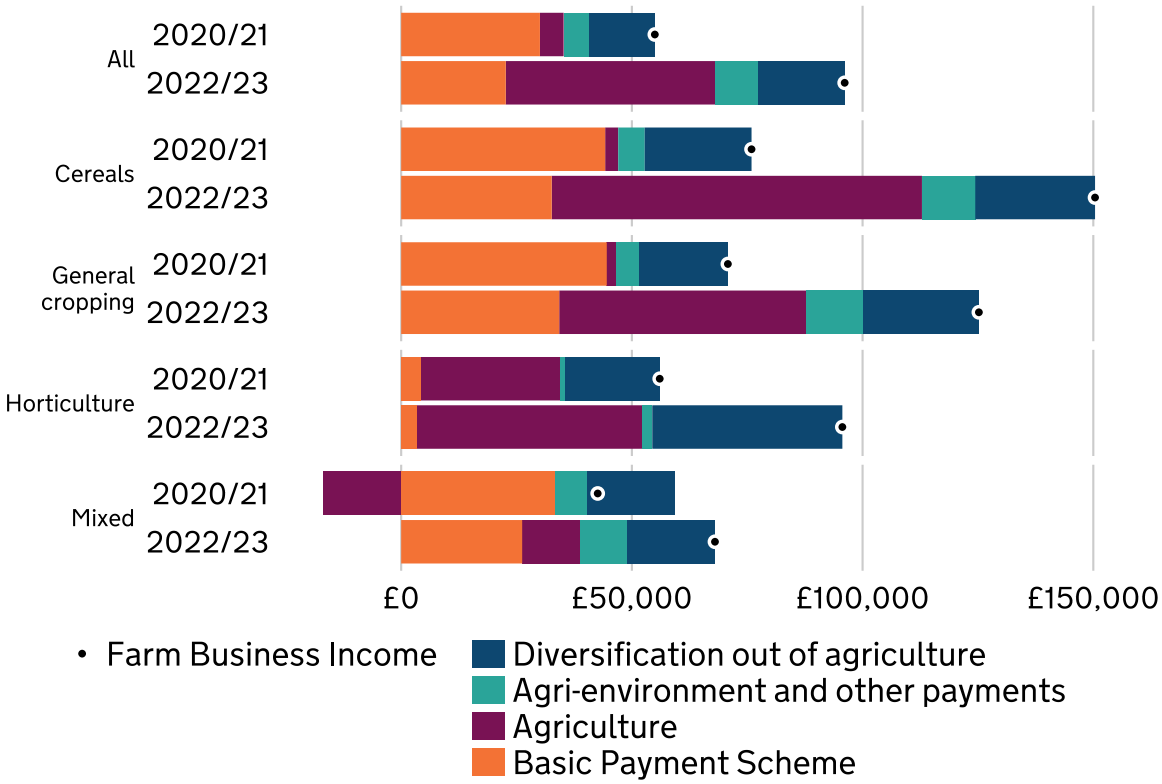
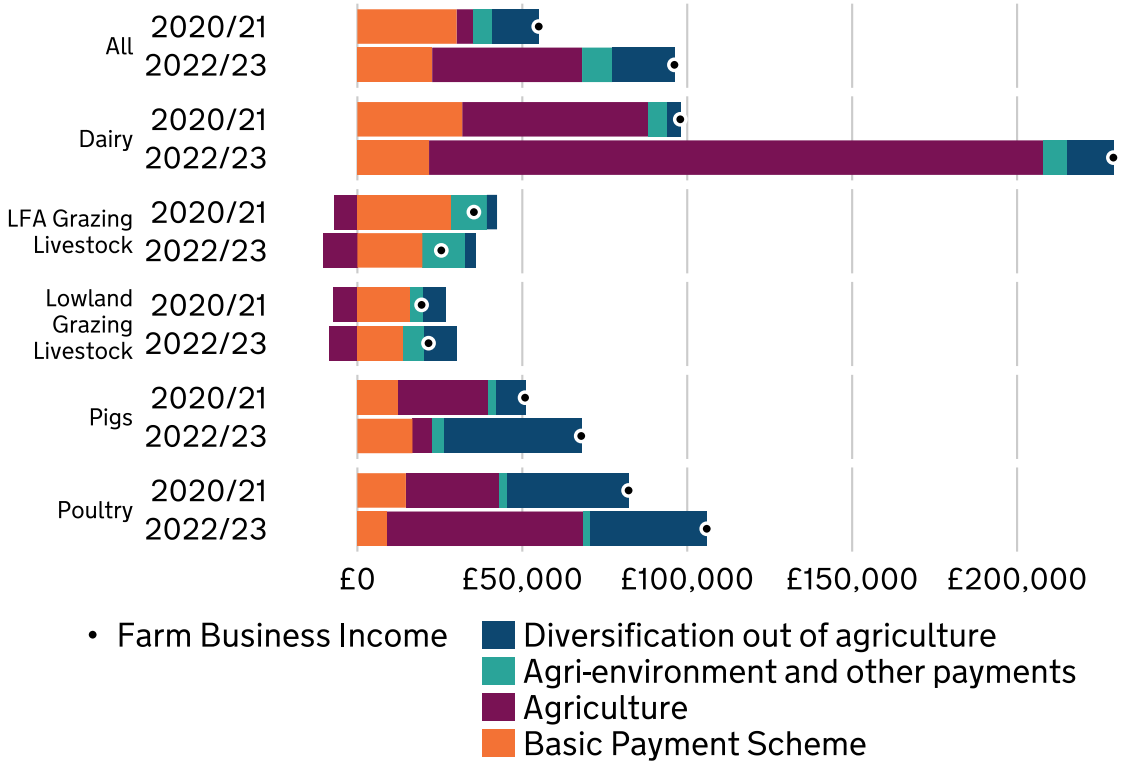


Figure 3.3.3g: Average Farm Business income (£ per farm) on livestock farms by cost centre, (real terms), England 2021/2022 to 2022/2023

Source: Monitoring the agricultural transition period in England, 2022/23, Defra



Farm Income at a farm level

Figures 3.3.3f and 3.3.3g use data on England to give both an indication of recent variation in FBI across different farm types for 2022/2023, and an indication of the immediate effects of Russia's invasion of Ukraine. There was an overall increase in total income for this period, with high rises for some sectors outweighing losses for others. The variation across farm types is due to a number of factors including production costs, farm size, farm location and soil type on the farm. For some farming sectors such as cereal and dairy farms, FBI increased because output costs offset increased input costs due to factors such as high prices and a good harvest. In contrast, FBI decreased for a number of farming sectors such as general cropping, grazing livestock, both lowland and those in Less Favoured Areas (LFA), poultry and mixed farms. The latest FBI data was published November 14, 2024. FBI fell for all farm types in 2023/24 except for pig farms and poultry farms. The decrease varied across farm type and should be viewed in context of longer-term trends as the fall in income followed exceptional highs for some farm types in 2020/21 and 2022/23.

Basic Payment Scheme reduction in England

Across all farm types in England, the average Basic Payment Scheme (BPS) payment received decreased from approximately £28,400 (55% of total FBI) in 2020/21 to £22,700 (around 25% of FBI) in 2022/23, which was a 20% reduction. The importance of the BPS income varies considerably across individual farm types. In 2022/23 BPS income made up 24% of total FBI, with grazing livestock and mixed farms being the most reliant on the payments in both 2020/21 and 2022/23. Figures 3.3.3f and 3.3.3g above show that for some years for these farm types, BPS income can be the difference between profit and non-profit. Following the 2024 Autumn Budget, direct BPS payments in England are now being phased out between 2021 and 2025, (previously between 2021 and 2027). Reductions are being applied to the total payment in each year during this period and this includes the BPS payments. Additionally, from 2024, the BPS will be delinked from land.

Other income streams (agri-environment and diversification)

The implications of reduced BPS income are uncertain. Attempts to recoup income could involve a range of other income streams. As BPS payments reduce during the agricultural transition period, other payments and grants are being introduced. These are designed to focus on environmental outcomes and supporting investment on farms. Agri-environment payments to some extent mitigate the loss of income from BPS payment reductions, but do not fully substitute that form of income. The payment equated to around 10% of total FBI in 2022/23 which was the same proportion as in 2020/21. For farm types such as Less Favoured Area (LFA) grazing livestock farms, payments associated with agri-environment activity equated to almost a third of total FBI in 2020/21 and around half of total FBI in 2022/23. At the all-farm level, income from payments associated with agri-environment activity showed a 73% increase to £9,200 per farm in 2022/23 compared to the pre agricultural transition level of 2020/21 before basic payments began to be phased out. Some farm businesses may look to stabilise overall income through increased diversification to activities with higher revenues (Berry, Vigani and Urquhart, 2022). 69% of farm businesses in England had some diversified activity in the period 2022 to /2023, an increase of approximately 12 percentage points from 2013/14.

Liabilities

Another measure of farm business resilience is the level of indebtedness, as measured by their total liabilities. Liabilities are the total debt (short-term and long-term) that the farm business holds, including mortgages, long-term loans and monies owed for hire purchases, leasing, and overdrafts. A farm with high levels of liabilities will require consistent income flows to ensure that interest payments can be met. In the last 10 years the average level of debt across all farms has generally been increasing in current terms from £172,100 in 2013/14 to 294,600 in

2022/23. At a sectoral level, most farm types saw an increase in their levels of liabilities between 2021/22 and 2022/23. The highest level of average liabilities in 2022/23 was seen in specialist pig and poultry farms. The largest rise in average levels of debt was seen in horticulture farms, which increased by 52% to £271,300 per farm in 2022/23. Measures such as liabilities can be considered alongside other indicators of financial health such as net worth, gearing ratio, liquidity, net interest payments as a proportion of FBI and return on capital employed.

Confidence

The National Farmers' Union's (NFU) Farmer Confidence Survey and Defra's Farmer Opinion Tracker show confidence in the agricultural sector for 2023 to 2024. They show sharp increases in uncertainty due to shocks and change. The NFU survey for both short-term (1-year) & mid-term (3-year) confidence levels were at their lowest levels recorded since the survey began in 2010. The leading concern in the short term was the effect of extreme weather, while the phasing out of the Basic Payment Scheme, the price of inputs, and regulation and legislation were the top three concerns for 2024.

Defra's Farmer Opinion Tracker also asks respondents how they feel about their future in farming, considering the changes to existing payments or regulations and future schemes that will become available. In April 2024, farmers on 40% (down 13% from April 2021) of holdings felt positive about their own future in farming (very positive 6%; somewhat positive 34%). Approximately 51% (up 13% from April 2021) indicated that they are not at all positive and the remaining 9% (no change from April 2021) are unsure how they feel about their own future in farming.

Theme 4: Food Security at Household Level

Introduction

Theme definition

This theme looks at access to food and a healthy and sustainable diet at the household level. People's access to the food they want and need to live a healthy active life is at the forefront of the 1996 World Food Summit food security definition. The stability of food security at the household level is enabled by the systems covered in the other themes. The theme measures household food security by tracking changes in experience-based measures of household food security, household expenditure and food prices, the uptake of interventions designed to support access to food, in-person and online retail, the nutritional intake of the population and emissions and environmental impacts associated with the UK food supply chain. The implications of UK consumption for UK food production are covered in more detail in Theme 2 UK Food Supply Sources. The theme opens by measuring trends in food affordability, including food expenditure and inflation, and use of food aid (Sub-theme 1). This is followed by an analysis of access to food shops across the country, both in terms of digital and physical access to food (Sub-theme 2). The chapter closes with an exploration of UK diets and consumption patterns (Sub-theme 3).

This edition of the UKFSR includes five new indicators to reflect other important dimensions of household food security and new available data. These cover the use of food aid (which includes the delivery of food parcels, food banks and social supermarkets) (4.1.5), digital access to food shops (4.2.2) and UK dietary patterns (4.3.1 to 4.3.3). There is also greater coverage of the experiences of different groups including vulnerable groups who are at much higher risk of food insecurity than the rest of the population.

Qualitative data is used to give some insight into the lived experience of food security in the UK, and to capture nuances not shown by national surveys. In particular, Indicator 4.3.2 on healthy diets includes a case study on the lived experience of food insecurity and its impact on health.

In terms of the dimensions of food security, accessibility is the focus in this theme with most indicators assessing changes to the affordability, allocation and preference of food at the household level. This includes considerations of agency, or the ability, of consumers to determine the food they eat. Stability and sustainability of household food security are also key areas measured. Two dietary indicators measure changes to the nutritional value of UK food consumption. The

theme tracks variation in food security across social groups to surface where impacts of food insecurity are most acutely felt.

Overall Findings

- **While a large majority of households in the UK continue to be food secure, there has been a notable decrease in food secure households** (defined as access by all people at all times to enough food for an active, healthy life) which has coincided with increased financial pressures to household budgets from both general high inflation and food inflation. Over the last three years, major factors affecting household-level food security have included the period of high inflation between 2021 and 2023, which saw rises in consumer price inflation outstrip wage growth, and, from 2020, the coronavirus (COVID-19) pandemic led to disruptions affecting businesses and consumers.
  Key statistic: The proportion of food secure households declined from 92% in financial year ending (FYE) 2020 to 90% in FYE 2023 (see Indicator 4.1.1 Household food security status).

- **Across the indicators rates of food insecurity vary greatly by demographics, with a notable difference in levels and experiences between income groups.** Low-income and disabled groups continue to be at disproportionately high risk of household food insecurity and its potential negative impacts. General inflation including energy price increases have heightened the risk of these households needing to make difficult trade-offs with their food budgets, including choosing how much to spend on heating and food.
  Key statistic: 84% of households with disabled people are classified as food secure compared to 94% for households without disabled people in FYE 2023 (see Indicator 4.1.1 Household food security status).

- **Over the period covered by this report there has been a rise in food aid usage,** with those accessing services being the most food insecure**.** These tend to be working age adults in receipt of means tested benefits and or living alone, disabled people, households with children and those in rented housing.
  Key statistic: In FYE 2023, 3.3% of all households used a food bank in the last 12 months, while 1.4% used one in the last 30 days (see Indicator 4.1.5 Food aid). These figures are higher for households with ‘low’ and ‘very low’ household food security at 14% and 31% respectively for households which used a food bank in the past 12 months (see Indicator 4.1.5 Food aid).

- **There has been a notable rise in inflation both overall and for the category of food and non-alcoholic beverages since the beginning of 2021**. Food price inflation was higher than general inflation and spiked to

45-year high in 2023. UK food price inflation was among the highest of the G7 economies in 2023. Inflation rates began to fall in 2023, and are now returning to pre-pandemic levels.
Key statistic: Over the last three years, inflation for food and non-alcoholic beverages peaked in March 2023 at 19.2% while overall inflation peaked in October 2022 at 9.6% (see Indicator 4.1.3 Price changes of main food groups and Theme 3 Indicator 3.1.5 Energy).

- **There has been a growth in online retail, with online food shopping peaking during the pandemic.** Regional differences remain across in-person access to food shops.
  Key statistic: During the pandemic, there was a rapid increase in online food shopping from 5.4% of all food shopping being carried out online in February 2020 to 12.4% in January 2021, while 37.5% of all retailing was online at its peak in February 2021. Online food shopping declined to 9.2%, while all retailing declined to 27.7% by September 2024, reflecting a return to in-store shopping but also a lasting increase in online food shopping compared to pre-pandemic figures (see Indicator 4.2.2 Online access to food shops).

- **Most people do not meet government dietary recommendations,** with those from lower-income groups less likely to meet recommendations than those from the highest-income groups.
  Key statistic: Mean intakes of saturated fat, free sugars and salt exceeded the recommended maximum, and mean intakes of fibre, fruits and vegetables, and oily fish fell below the recommended minimum across adults in 2019. While no income group meets dietary recommendations, those on higher incomes are typically closer to meeting some of the dietary recommendations with the poorest 10% eating on average 42% less fruits and vegetables than recommended, compared to the richest who eat 13% less (see Indicator 4.3.2 Healthy diet).

- **The UK diet is becoming more environmentally sustainable in terms of lower food-related greenhouse gas (GHG) emissions.** However, UK consumption of food commodities is also associated with a recent uptick in impacts on deforestation, water scarcity and biodiversity loss.
  Key statistic: From 2019 to 2021 UK GHG food-related emissions have broadly remained stable or shown some notable decreases depending on the supply chain stage, with a notable decrease in emissions from imports which fell from 58 $MtCO_2e$ in 2019 to 54 $MtCO_2e$ in 2021 . Similarly, the supply chain and consumer sector saw a downward trend over the same period, decreasing from 36 $MtCO_2e$ in 2019 to 33 $MtCO_2e$ in 2020, with a small rise to 34 $MtCO_2e$ in 2021 (see Indicator 4.3.3 Sustainable diet).

Cross-theme links

By measuring the accessibility and utilisation of food in the UK, Theme 4 analyses the outcome of the sourcing and supply of food (enabling the availability of food) covered across Themes 1 to 3. Cumulative costs passed on from these parts of the supply chain have driven food inflation and therefore reduced accessibility.

Food prices increasing coincided with more prominent self-reporting of food prices as a consumer concern (when prompted). This is explored further in Theme 5 Food Safety and Consumer Confidence.

In the other direction, sourcing and supply of food covered in Themes 1 to 3 are influenced by consumer choice. What consumers prefer to purchase in part drives what is profitable for retailers to stock or farmers to farm, whether that is fruit grown abroad, home-produced chicken meat or highly processed foods requiring complex inputs.

Sub-theme 1: Affordability

4.1.1 Household food security status

Rationale

Emerging trends of household food insecurity reported by households play an important role in understanding levels of household food security across the country and how this is affected by the affordability of food.

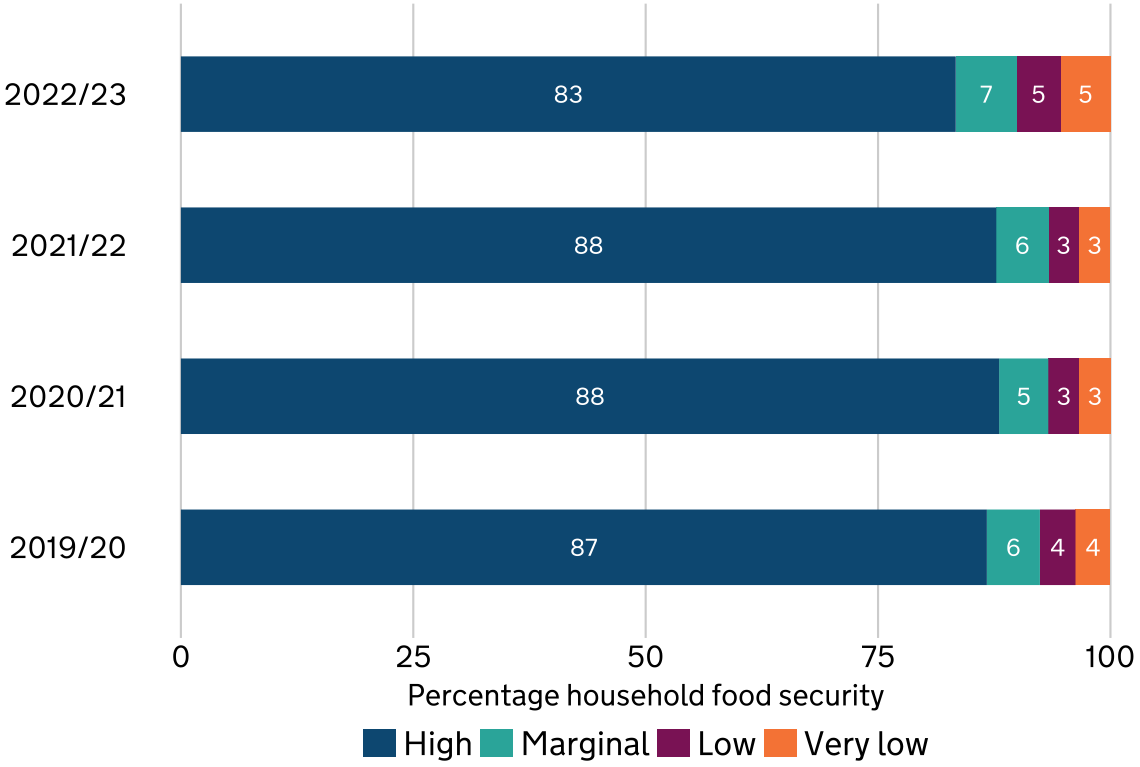
Government statistics on household food insecurity come from the Family Resources Survey (FRS) which defines 'household food security' as 'a measure of whether households have sufficient food to facilitate an active and healthy lifestyle.' The survey asks questions related to the household's experience in the 30 days immediately before the interview to explore the financial situation of households and how that affects their access to food and to provide a household 'score' for food security.

Here, 'food secure' combines households classified as having high and marginal levels of household food security, and they are considered to have sufficient, varied food to facilitate an active and healthy lifestyle. 'Food insecure' households are classified as having low and very low levels of household food security where there is risk of, or lack of access to, sufficient, varied food. Further information on the FRS methodology is covered below under 'supporting evidence.'

Headline evidence

Figure 4.1.1a: Household food security status of all households in the UK, FYE 2020 to FYE 2023

Source: Family Resources Survey, Department of Work and Pensions (DWP)



Note: Individual figures have been rounded independently, so the sum of component items will not necessarily equal the totals shown.

In the UK, in FYE 2023, 90% of households were classed as being food secure ('high' or 'marginal' food security) and 10% as being food insecure ('low' or 'very low' food security). The proportion of food secure households declined from 92% in FYE 2020 to 90% in FYE 2023. FYE 2023 marks the lowest proportion of households experiencing food security since the introduction of household food security to the FRS in FYE 2020. Supporting evidence tracks how levels of food security vary across the population to show where risks are more acute.

Supporting evidence

It is worth noting that interventions started during the coronavirus (COVID-19) pandemic, such as the furlough scheme and £20 uplift to universal credit which were in place until Autumn 2021, may have contributed to lower food insecurity in FYE 2021 and FYE 2022. Cost of Living payments were also introduced from 2022 to help with the cost of living from 2022 to 2024.

Differences in methodologies

This indicator uses data from 3 different surveys on food security: DWP's FRS, the FSA's Food and You 2 Survey and the Food Foundation's Food Insecurity Tracker. All 3 surveys use questions from the United States Department of Agriculture's Food Security Survey module, enabling international comparisons. However, the surveys differ in some ways such as the survey method, sample size, frequency, time periods and recall period, therefore results cannot be compared. All 3 datasets are included because there are many ways to conduct surveys, and all have pros and cons.

The FRS is an annual survey which has a sample size of about 20,000 households in the UK. It classifies respondents based on their survey responses to questions on their access to food and how this has been affected by the financial situation of the household. Data on food security has been part of the FRS since FYE 2020. 'Food insecure' in this survey means access to adequate food is limited by a lack of money and other resources.

In contrast to many Household questions on the FRS, for Food Security questions the interviewer asks the person with the most responsibility for buying and preparing food in the household to assess their overall household food security within the last 30 days by answering a series of questions. It is important to note that in many cases this is not the same person as the Head of Household. The questions asked include experiences of worrying about food running out, being unable to afford a balanced meal, experiencing hunger, and missing meals in the past 30 days. In a household with more than one person, the Head of Household is defined as "the householder with the highest personal income, taking all sources of income into account. If there are two or more householders who have the same income, the Head of Household is the elder."

The Food and You 2 survey has been carried out twice a year since 2020. The survey is conducted with adults (aged 16 years or over) living in households in England, Wales and Northern Ireland. Households are selected at random and up to 2 adults in each household can take part. Approximately 5,800 adults from around 4,000 households take part in each survey. Respondents can take part online or by post. Food security is measured using the USDA's adult food security module using a 12-month recall period. More detail on the survey methodology can be found in the technical report.

The Food Foundation Food Insecurity Tracker is run twice a year across the UK with normally a sample size of about 5,000 to 6,000 adults, while every few surveys there are about 10,000 adults sampled. The survey was first conducted in March 2020, at the start of the COVID-19 pandemic.

While the 30-day reference period used in the FRS may have some limitations in that it can provide only a snapshot of food insecurity at a given time, it has a comparatively large sample size, covers the whole of the UK and is a useful measurement to have alongside data on income, benefit recipients and sociodemographic characteristics. Findings from the FRS are complemented by findings from the FSA's Food and You 2 Survey, which has a shorter lag time before publication and is published twice a year. The Food Foundation's Food Insecurity Tracker has more recent data than both the other surveys, with the latest period covered being June to July 2024.

Income

Food security increases as incomes increase. In the Family Resource Survey, in FYE 2023, 81% of households with gross weekly incomes of less than £200 per week were food secure (72% high; 9% marginal). This is almost unchanged from FYE 2020 when 81% of households were food secure, but 74% were high while 7% were marginal. 97% of households with a gross weekly income of £1000 or more were food secure in FYE 2023, similar to in FYE 2020 when 98% were food secure.

The FRS shows that in FYE 2023 households on any income-related benefit were less likely to be food secure with only 70% of households being food secure (57% high; 13% marginal) compared with all households with 90% food secure (83% high; 7% marginal). This has gone down from FYE 2020 when 75% of households on income-related benefits were food secure (64% high, 11% marginal).

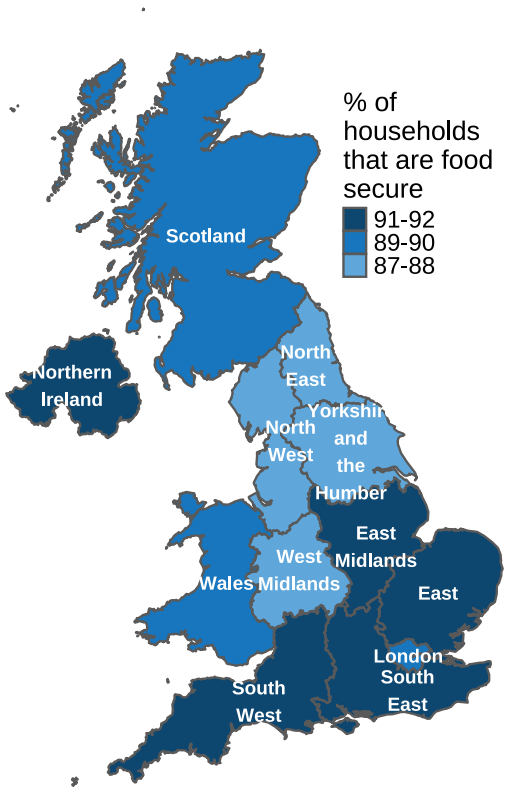
Households receiving Income Support were the least likely to be food secure in FYE 2023, at 58%, down from 64% in FYE 2020 when households on Jobseeker's Allowance were the least likely to be food secure (63%). Households receiving Universal Credit had the lowest proportion with high household food security in FYE 2023, with 42%. In FYE 2020 it was 45%, however the position was unchanged.

Data from the Households Below Average Income dataset shows that in FYE 2023 78% of individuals living in households with less than 60% of contemporary median household income (before housing costs) were living in a household which was food secure. This shows a decrease since FYE 2020 when 81% were food secure. Children living in households with less than 60% of contemporary median household income (before housing costs) were slightly less likely to be food secure, with only 70% living in a household which is food secure in FYE 2023, compared to 74% in FYE 2020.

Region

Figure 4.1.1b: Household food security status by region/country in the UK, FYE 2023

Source: Family Resources Survey, DWP



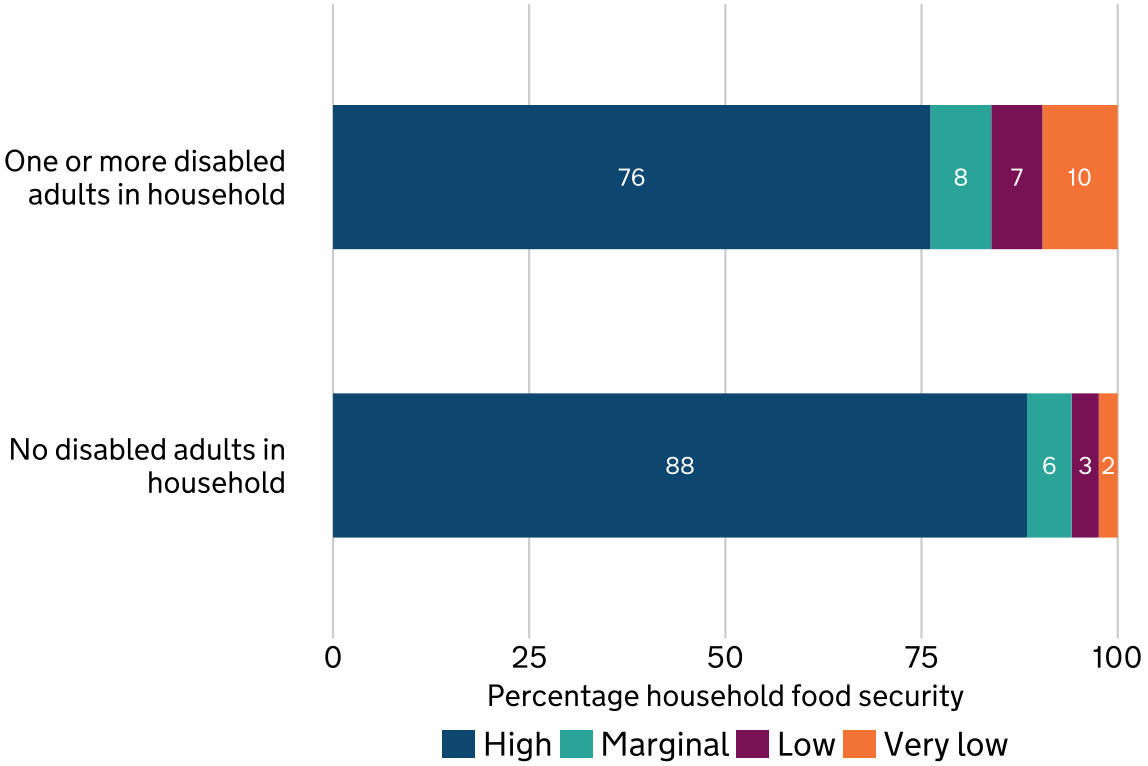
Geographical differences remain across the UK in FYE 2023 with the lowest rate of food security in the North West (87%) followed by the North East, Yorkshire and the Humber, and the West Midlands, each with 88% of households being food secure (Figure 4.1.1b). Food security was highest in the East, South East and South West of England, where 92% of households were food secure in all three regions. Within the individual countries of the UK, Scotland had the lowest percentage of households which were food secure at 89% while Northern Ireland had the highest at 91%.

Geographical differences were similar in FYE 2020, when the North East had the lowest percentage of households which were food secure at 89%, followed by the North West at 90%. The East of England had the highest percentage of households which were food secure at 95%, followed by the South East and South West with 94%. Food security was similar throughout the UK with the percentage of households that were food secure in all countries being either 92% or 93%.

Disability status

Figure 4.1.1c: Household food security status by disability in the UK, FYE 2023

Source: Family Resources Survey, DWP



Households with disabled adults tend to experience lower food security compared to those without disabled members. In FYE 2023, households without disabled adults had a higher proportion of food security, with 94% classified as food secure (88% high, 6% marginal) (Figure 4.1.1c). In contrast, households with one or more disabled adults exhibited lower levels of food security, with 84% classified as food secure (76% high, 8% marginal).

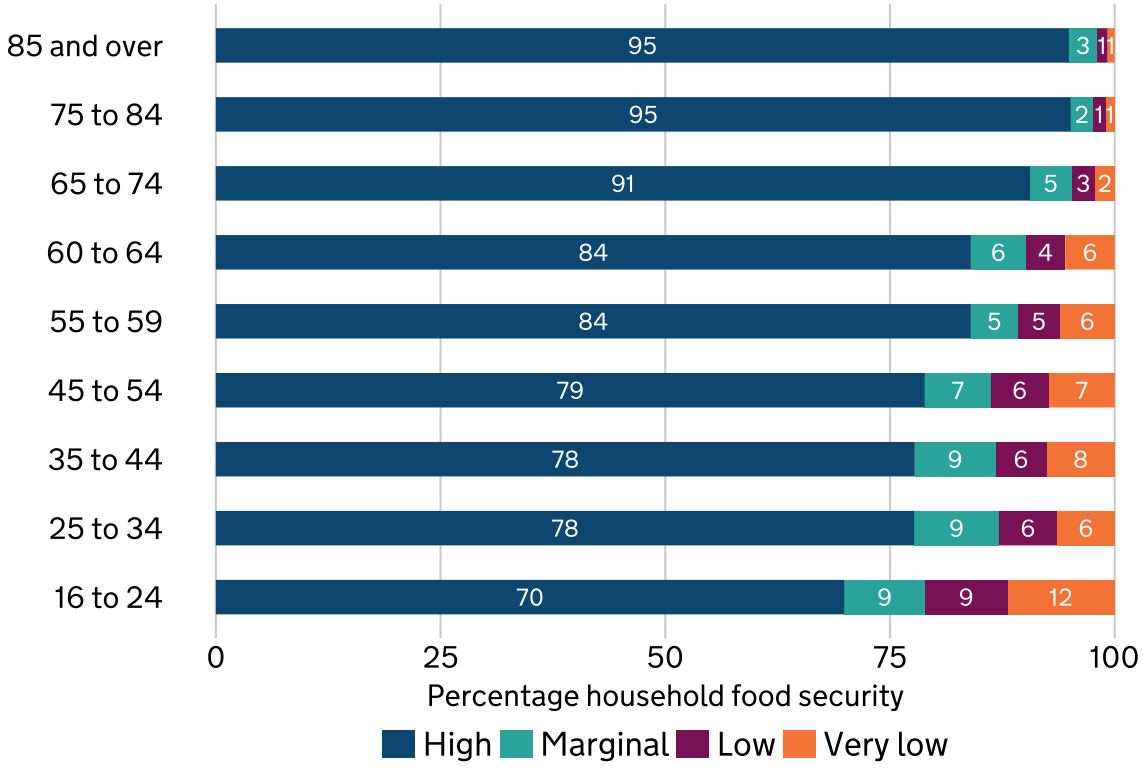
This is lower than in FYE 2020 when 88% of households with one or more disabled adults were food secure. Similar to FYE 2023, in FYE 2020 95% of households with no disabled adults were food secure.

The number and type of disabilities are associated with higher risk of food insecurity. A combination of physical and cognitive disabilities, as well as having multiple disabilities, are each independently associated with higher risk of food insecurity (Hadfield-Spoor, Avendaro and Loopstra, 2022).

Age

Figure 4.1.1d: Household food security by age of head of household in the UK, FYE 2023

Source: Family Resources Survey, DWP



Food security tends to improve as the age of the head of the household increases.

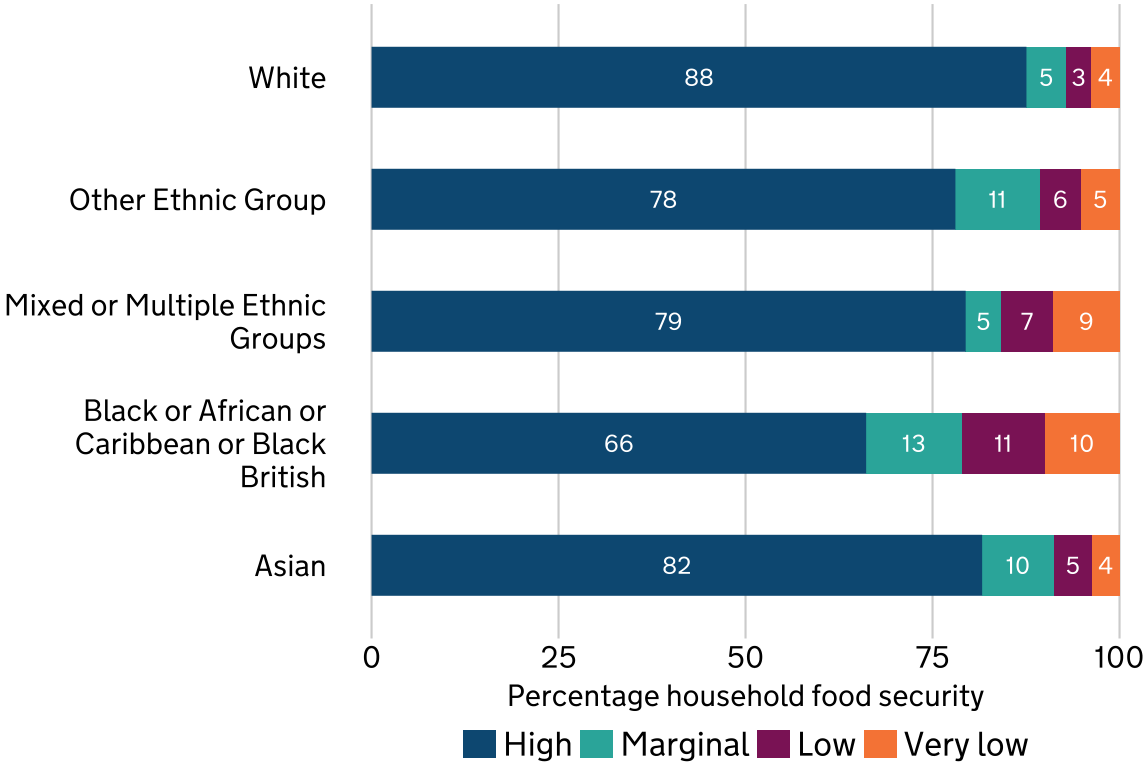
In FYE 2023 the youngest age group, 16 to 24, shows the lowest level of food security, with only 79% classified as food secure (compared with 85% in FYE 2020) (Figure 4.1.1d). This trend is similarly reflected in households headed by individuals aged 25 to 34 and 35 to 44, where 87% are food secure (compared to 90% and 88% respectively in FYE 2020).

Conversely, households where the head is aged 85 and over had the highest level of food security in FYE 2023, with 98% classified as food secure (in line with 99% food secure in FYE 2020). Similarly, households headed by individuals aged 75 to 84 also showed high levels of food security, with 98% classified as food secure (compared to 99% in FYE 2020).

Ethnicity

Figure 4.1.1e: Household food security by ethnicity of head of household, FYE 2021, 2022 and 2023 as a 3-year average

Source: Family Resources Survey, DWP



Levels of household food security vary by ethnicity. The latest household food security data by ethnicity is published as the average of the last 3 years, covering FYE 2021, 2022 and 2023 while FYE 2020 was published as a single year of data.

In the 3 years preceding FYE 2023, White households had the highest level of food security, with approximately 93% classified as food secure (88% high, 5% marginal) (Figure 4.1.1e). This is unchanged since FYE 2020.

In contrast, Black, African, Caribbean or Black British households had the lowest level of food security in the 3 years to FYE 2023, with about 79% classified as food secure (66% high, 13% marginal); similar to FYE 2020 when 81% were food secure (74% high, 7% marginal).

Composition of household

In FYE 2023, 92% of households without children were food secure, compared to 85% of households with children. This shows a decrease in the percentage of food secure households from FYE 2020, when 94% of households without children were food secure, and 89% of households with children. The households with the highest percentage which are food secure in FYE 2023 were those with 2 adults, both over the age of state pension (99%) while those households with only one adult, but 3 or more children had the lowest percentage (57%).

Findings from the FSA's Food and You 2 Survey

The Food Standards Agency has been conducting the Food and You 2 survey twice a year since 2020. This official statistic survey measures consumers' self-reported knowledge, attitudes and behaviours in relation to food safety and other food issues, including food insecurity. The survey is conducted with adults (16 years and over) living in households in England, Wales, and Northern Ireland.

The Food and You 2 survey reported that following a period of stability between Wave 1 (July to October 2020) and Wave 3 (April to June 2021) there was an increase in the percentage of respondents classified as food insecure (low or very low food security) from 15% in Wave 3 (April to June 2021) to 25% in Wave 6 (October 2022 to January 2023). The percentage of households classified as food insecure remained unchanged at 25% in Wave 7 (April to July 2023).

The Food and You 2 survey reports higher levels of food insecurity among some groups of respondents. This includes younger adults, those with a lower household income, those who are long-term unemployed, households with children, those living in urban areas, and those with a long-term health condition.

Findings from the Food Foundation's Food Insecurity Tracker

In an online survey of 6,177 adults across June and July 2024, the Food Foundation found that 13.6% of households experienced moderate or severe food insecurity (for definition see slide 2 of the Food Insecurity Tracker), up from 8.8% in January 2022, peaking at 18.4% in September 2022. 12.2% of households were having smaller meals or skipping meals in June 2024 up from 7.8% in January 2022, having peaked in September 2022 at 17.6%.

In June 2024, 18% of households with children experienced household food insecurity, compared to 12.1% in January 2022, peaking at 25.8% in September 2022. This compares to 11.7% of households without children experiencing

household food security in June 2024, rising from 7.8% in January 2022, having also peaked in September 2022, at 16%.

In June 2024, 17% of households with one child were food insecure, compared to 26% of households with 4 or more children. In households which were headed by a single adult with children, 31.4% were food insecure, compared to 15.9% of multi-adult households with children. 41.9% of households in receipt of Universal Credit were household food insecure, while only 10.6% of household not receiving Universal Credit were food insecure in June 2024.

4.1.2 Household spending on food

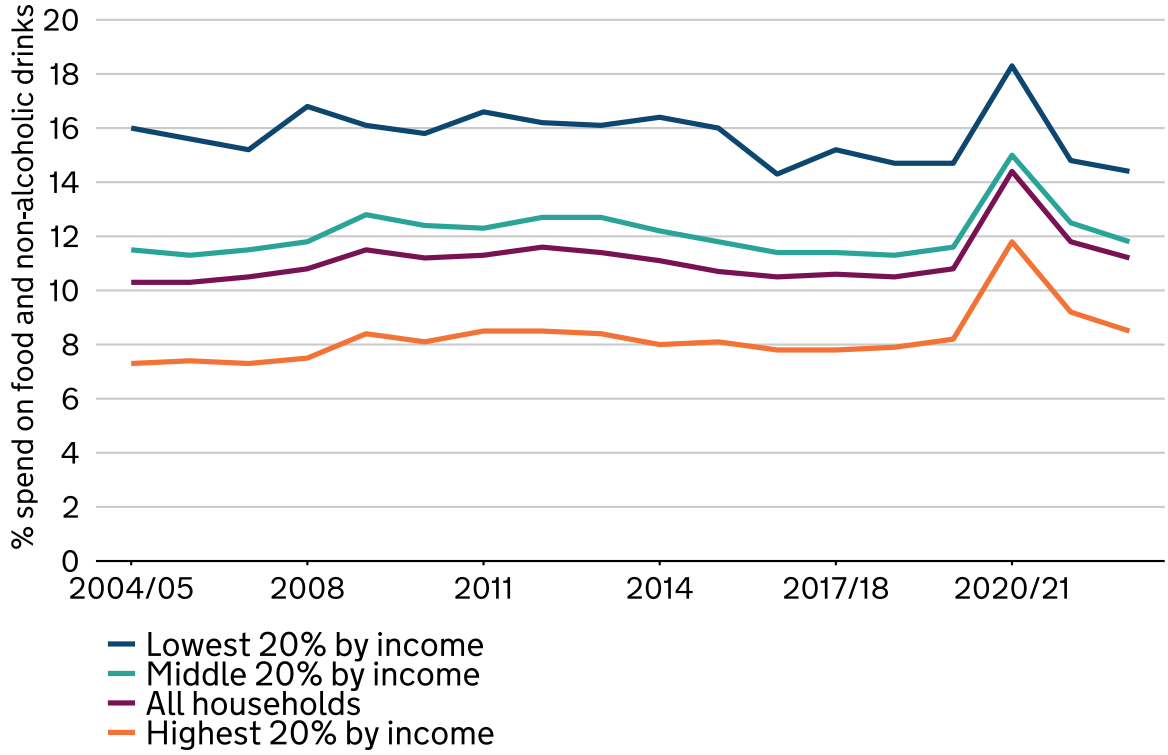
Rationale

This indicator illustrates how growth in other household spending categories may impact the budget available to spend on food. These other expenses include housing, fuel and transport. Increases in costs for these lead to trade-offs with food. As the lowest income groups spend higher proportions of their income on food, the 'all households' metric is skewed by the top of the distribution, who spend proportionally less. The middle and final quintiles provide additional data to highlight how spending patterns change across income distributions.

Headline evidence

Figure 4.1.2a: Average share of spend on food and non-alcoholic drinks, by equivalised disposable income quintile group, in the UK, FYE 2005 to 2023

Source: Family Spending in the UK, Office for National Statistics (ONS)



Note: Data is from both financial year and annual year reporting due to switches in the survey methodology. In 2006, the ONS switched from financial year reporting to annual years, then went back to financial years in FYE 2016 and this has since remained as the chosen method.

In FYE 2023 food and non-alcoholic beverages represented 11.2% of household expenditure in the UK and was the fifth largest category of household expenditure after housing (net) and energy costs (18.6%), transport (14.0%), other expenditure items (13.3%) (which includes mortgage interest payments and council tax as well as spending on licences, holiday spending and cash gifts) and recreation and culture (11.5%). The ONS provides an interactive chart to explore further breakdowns.

There was an increase in the share of spend on food and non-alcoholic beverages drink from FYE 2020 for all households, the highest quintile and the middle quintile (0.4%, 0.3% and 0.2% respectively); however, the lowest quintile (poorest 20% of households) saw a fall (0.3%). This was due to a reduction in spending in other

areas such as eating out, holidays and leisure when lockdown restrictions were imposed.

Figure 4.1.2a highlights that lower-income households spend a larger portion of their income on food than higher-income households. In FYE 2023 food and non-alcoholic beverages expenditure was higher than previous years as a proportion of overall expenditure for households in the third quintile (middle 20%) and lowest quintile (bottom 20%) by equivalised disposable income, at 11.8% and 14.4% respectively. In contrast, the share of spend on food was 8.5% for households in the highest quintile (richest 20% of households).

The last three years has seen an increase in pressure on household food budgets. Following disruption to the trend due to the COVID-19 pandemic, this reduction in food spend is a return towards proportions spent on food over the last 10 years. However, other household pressures have increased with more volatile price changes across inputs such as gas and electricity, since Russia's invasion of Ukraine (see Theme 3 Indicator 3.1.5 Energy Dependency for more information on changes to energy prices). Electricity, gas and other fuels made up 6.5% of average household expenditure in FYE 2023 (£37.10 per week), an increase from 4.8% in FYE 2021 (£23.20 per week), and contributed towards housing costs which make up the largest expenditure category (Family Spending in the UK, ONS).

Supporting evidence shows that food affordability has been under pressure over the last few years. Actual spending on food in real terms dropped during the period of high inflation. There are indications of trade-offs with food purchasing being made due to rising costs in areas such as fuel and transportation.

Supporting evidence

Inflation

Since 2021 there have been pressures on household food budgets due to general inflation, as well as food and drink inflation itself. While inflation remained low during the height of the pandemic, it surpassed growth rates in real regular pay in August 2021 when the annual rate for Consumer Prices Index including owner occupiers' housing costs (CPIH) rose to 3% and wage growth fell to 1.8%. This gap increased steadily for the remainder of 2021, driven by prices rising from a slow reopening of global supply chains. This coincided with a lessening of COVID-19 restrictions, and spending on food to eat at home falling by 11.3% from £69.20 in FYE 2021 to £62.20 in FYE 2022. Subsequent supply-side shocks caused by Russia's invasion of Ukraine led to further price rises, with household energy inflation peaking at 88.9% in October 2022. At this time, the gap between CPIH and wage growth was at its largest, with annual CPIH inflation rate at 9.6%, exceeding regular pay growth at -2.7%. A reduction in business confidence early

in 2022 likely affected prospects of higher wages, compounded by higher input costs reflecting both energy volatility and commodity markets. Following the inflationary peak, the wage-inflation gap decreased with wage growth beginning to increase and inflation falling back for the remainder of 2023 and into 2024.

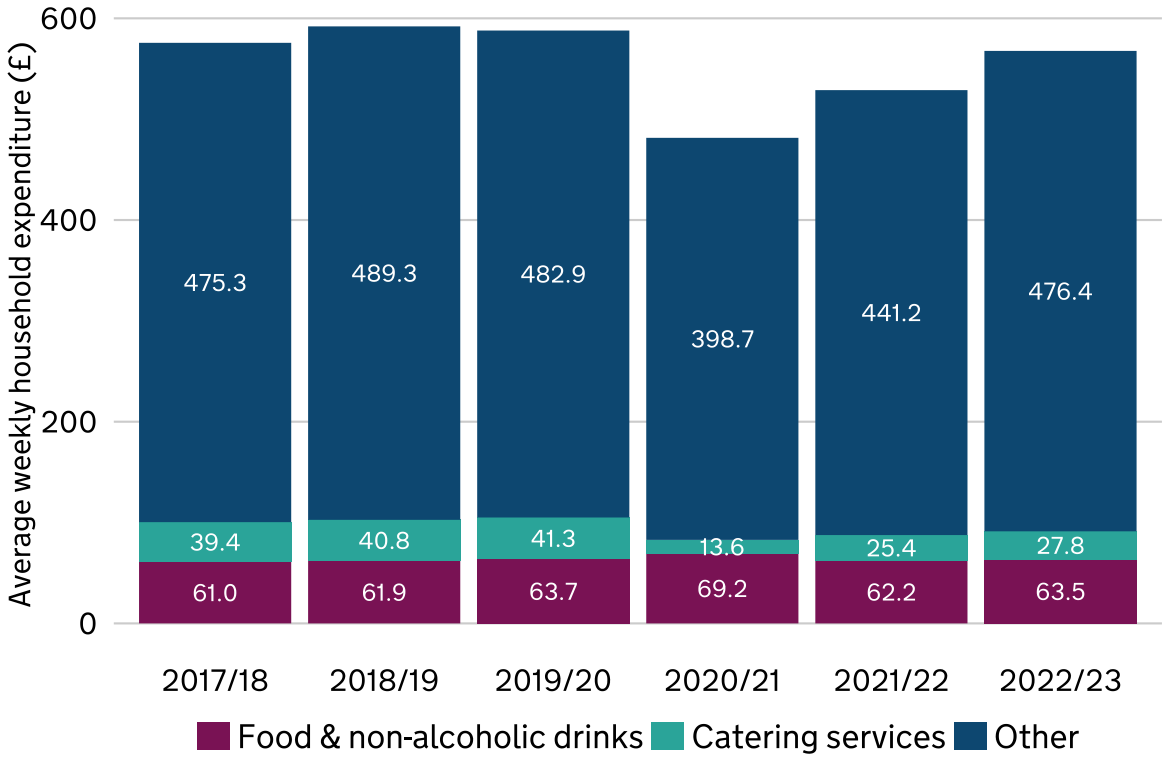
Weekly spend on food increased to £63.50 in FYE 2023, however, ONS cite that, after adjusting for inflation, average weekly spending decreased across most expenditure categories during FYE 2023. This included food, which saw a rise in the nominal weekly average expenditure (1.3%) while having the largest reduction in real terms expenditure (-7.5%). The impact of inflation on households is covered in further detail in Indicator 4.1.3 Price changes of main food groups.

Food expenditure

The percentage of spend on food has remained relatively constant over the last two decades; although there has been more volatility in the last three years, the share of spend on food is now at similar levels to those seen in 2019 (Figure 4.1.2a). This is based on food bought for the home.

Figure 4.1.2b: Average weekly household expenditure in the UK, in current prices, FYE 2018 to 2023

Source: Family Spending, ONS



Family Spending in the UK estimates that total household expenditure declined sharply during the pandemic, dropping by £106.40 per week from £587.90 per household per week in FYE 2020 to £481.50 in FYE 2021 (Figure 4.1.2b). Note that these figures are in current prices, therefore not taking inflation into account. As of FYE 2023, household expenditure has remained higher than in FYE 2021 but is slightly below (by £20.20) expenditure in FYE 2020 which was £567.70.

While spending in restaurants, cafes and takeaways (catering services) fell in FYE 2021 due to restrictions, from £41.30 per household per week in FYE 2020 to £13.60 in FYE 2021, household food and non-alcoholic beverages expenditure rose to take its place, from £63.70 in FYE 2020 to £69.20 in FYE 2021. In FYE 2022 and 2023 this spending pattern began to return to that previously seen in the UK prior to the pandemic, although spending on catering services is still substantially below that of FYE 2020.

The “Catering services” category is made up of spend on restaurant and café meals, alcoholic drinks, take-away meals eaten at home, other take-away and snack food, and contract catering (food) and canteens.

While the proportion of household expenditure going on food and non-alcoholic drinks has returned to pre-pandemic levels, actual expenditure on food and non-alcoholic drinks in real terms is below pre-pandemic levels. Family Spending in the UK shows that, after taking inflation into account (real terms), household spending on food and non-alcoholic beverages dropped in FYE 2022 compared with FYE 2021 and FYE 2020.

ONS's analysis of their Consumer Trends publication shows that a significant divergence between the current price and real terms measures of household expenditure on food occurred from the start of the cost-of-living period from Quarter 4 (October to December) 2021 onwards. Total food expenditure in the UK (in current prices) increased sharply by £5.1 billion (17.4%) over the cost-of-living period, Quarter 4 (October to December) 2021 to Quarter 2 (April to June) 2023. By contrast, the real terms expenditure on food fell by 5.8% over the same period. This suggests that households increasingly changed their behaviour, consuming less food or switching to food of lower quality, while spending more in cash terms.

The fall in real terms expenditure on food is a further example of the cost-of-living pressures faced by households. A decrease in the volume of food spending is a relatively unusual change in consumer behaviour, again last seen to a lesser degree after the financial crisis of 2008 to 2009.

Consumer behaviour change was also noted in the Food Standards Agency (FSA) and Food Standards Scotland (FSS) publication Our Food 2023 which reported that the actual amount spent, and types of products purchased changed in response to changes in prices. Food prices remained top of the list of consumer concerns across all four UK nations (72% of respondents in England, Wales and Northern Ireland in July 2023 - Food and You 2, Wave 7, 93% of respondents in Scotland in December 2023 - Food in Scotland Consumer Tracker, Wave 17). Many consumers reported reducing their overall food consumption or opting for cheaper alternatives for financial reasons. This is covered in further detail in Indicator 4.1.3 Price changes of main food groups.

Competition with other costs

The recent increase in the costs of housing, fuel, transport and other essential household items may have resulted in people being forced to choose whether to allocate limited income to heating homes or to buying food. Data released by The Food Foundation reported that 59% of households were worried that higher energy prices will mean they have less money to buy food for themselves or their family.

A report from the University of York, with real-time evidence from families living in poverty, found that the compounding effect of high costs for energy and food can

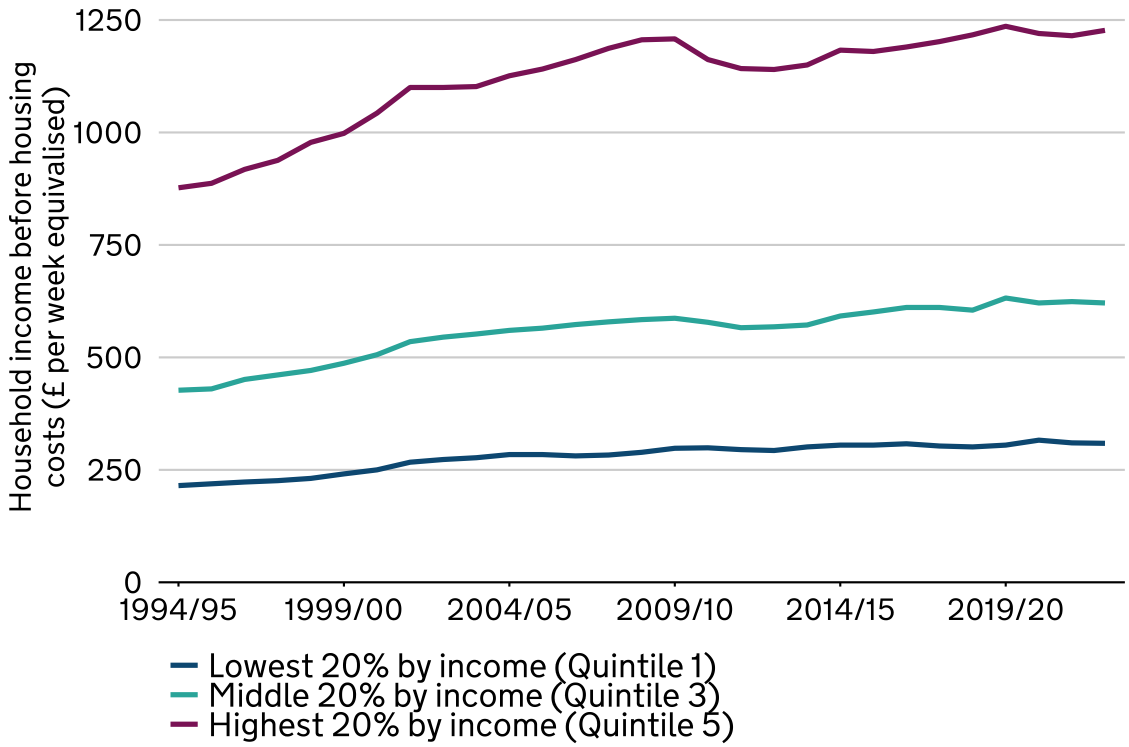
be detrimental to mental health, with both children and adults affected by heightened stress and anxiety due to financial pressures. The health impact of food insecurity is further explored in Indicator 4.3.2 Healthy diet.

According to a House of Lords Library report there is also a disproportionate effect on people living with a disability as households with disabled people spend a greater proportion of their income on food and energy. ONS data suggests that spending on food and non-alcoholic beverages averages 14% of costs for disabled households, compared to 11% for households with no disabled people.

Income

Figure 4.1.2c: Household income in the UK (before housing costs) of estimated quintile medians, in pounds per week equivalised, FYE 1995 to FYE 2023, in FYE 2023 prices

Source: Households Below Average Income, DWP



Note: Median income is used as the average, instead of the mean, as the median is less affected by the very small number of high earners and the skewed distribution of earnings.

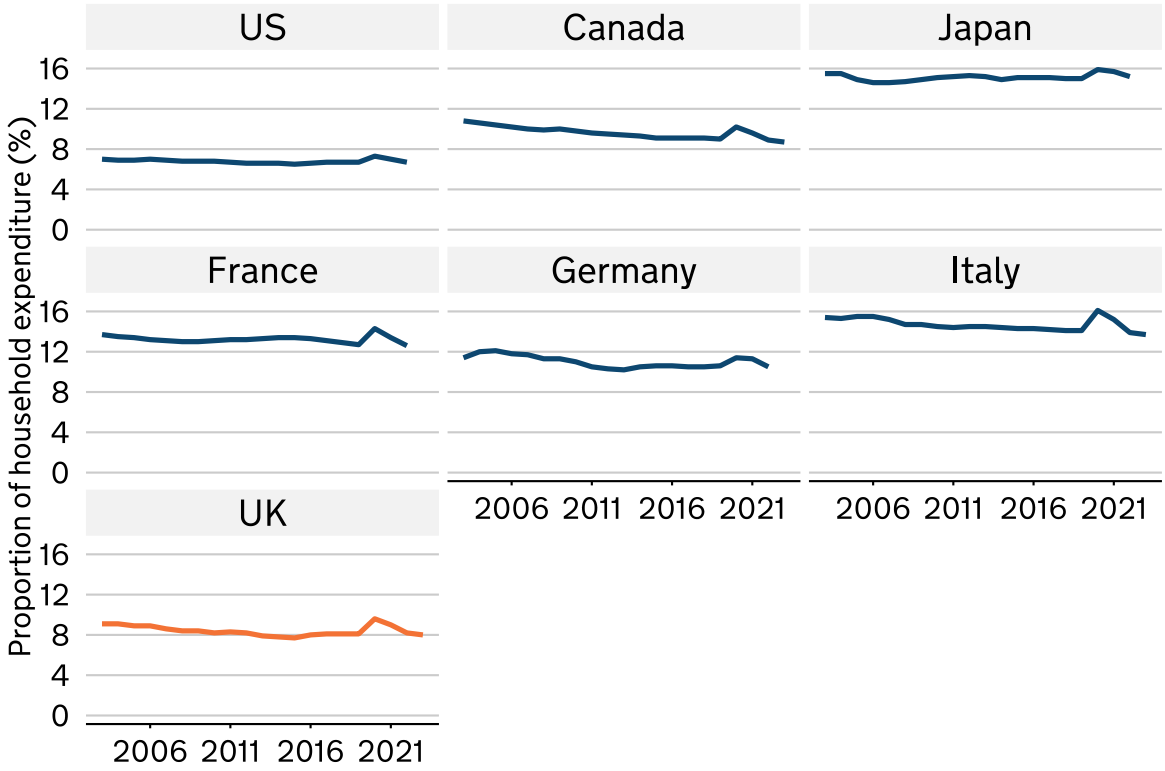
Data from the Household Below Average Income dataset shows that since FYE 2020, median household income in the UK has decreased by 1.6%, from £632 per week to £621 in FYE 2023 (Figure 4.1.2c). Quintile 1 (the lowest 20% by median income) saw a rise in household income of 1.4% from £305 in FYE 2020 to £309 in FYE 2023, while Quintile 5 (the highest 20% by median income) saw a fall in income (lower than the fall of the median household income) of 0.8%, decreasing from £1,236 in FYE 2020 to £1,227 in FYE 2023.

The ONS's Average Household income publication also publishes median equivalised disposable household income data. This shows that in FYE 2020 the median income decreased by 1.8%, and for the lowest quintile of the population it decreased by 2.4%. In FYE 2023 the median income decreased by 2.5% to £34,500 and, for the lowest quintile, it increased by 2.3% to £16,400, partly because of government cost of living support measures.

International comparison

Figure 4.1.2d: Proportion of household final consumption expenditure spent on food and non-alcoholic beverages in the G7 countries, 2005 to 2022

Source: OECD Data Explorer



Note: The proportion of final consumption expenditure in Figure 4.1.2c is not from the same data as the share of spend on food and non-alcoholic beverages data in Figure 4.1.2a so cannot be compared.

Data from the OECD on household final consumption expenditure shows that the UK has a comparable level to most countries in the G7. In 2022, 8.2% of household expenditure in the UK was spent on food and non-alcoholic beverages, which is the second lowest proportion of the G7 countries (Figure 4.1.2d). The highest proportion spent was by Japanese households at 15.2%, in contrast to the US which had the lowest proportion of 6.7%. Comparisons in Figure 4.1.2d do not consider the subjectivity of valuing items as some may have cultural significance increasing their value in some countries.

All G7 countries saw an uptick in 2020 which was largely impacted by shifting spending patterns seen during the onset of the Pandemic. The 2022 figure for the UK is down 0.2% compared with 2021 and is 1.6% lower than in 2020.

Figures 4.1.2a and 4.1.2d are not comparable. Figure 4.1.2a shows the proportion of an average household's expenditure that is estimated to be spent on food and

non-alcoholic beverages. It is sourced from the ONS's Living Costs and Food Survey and can be found in their Family Spending publication.

Figure 4.1.2d shows the proportion spent on food and non-alcoholic beverages of household final consumption expenditure in the domestic economy, whether by residents or non-residents. The data for this chart originates from Gross Domestic Product data, and for the UK can be found in ONS's Consumer Trends publication.

4.1.3 Price changes of main food groups

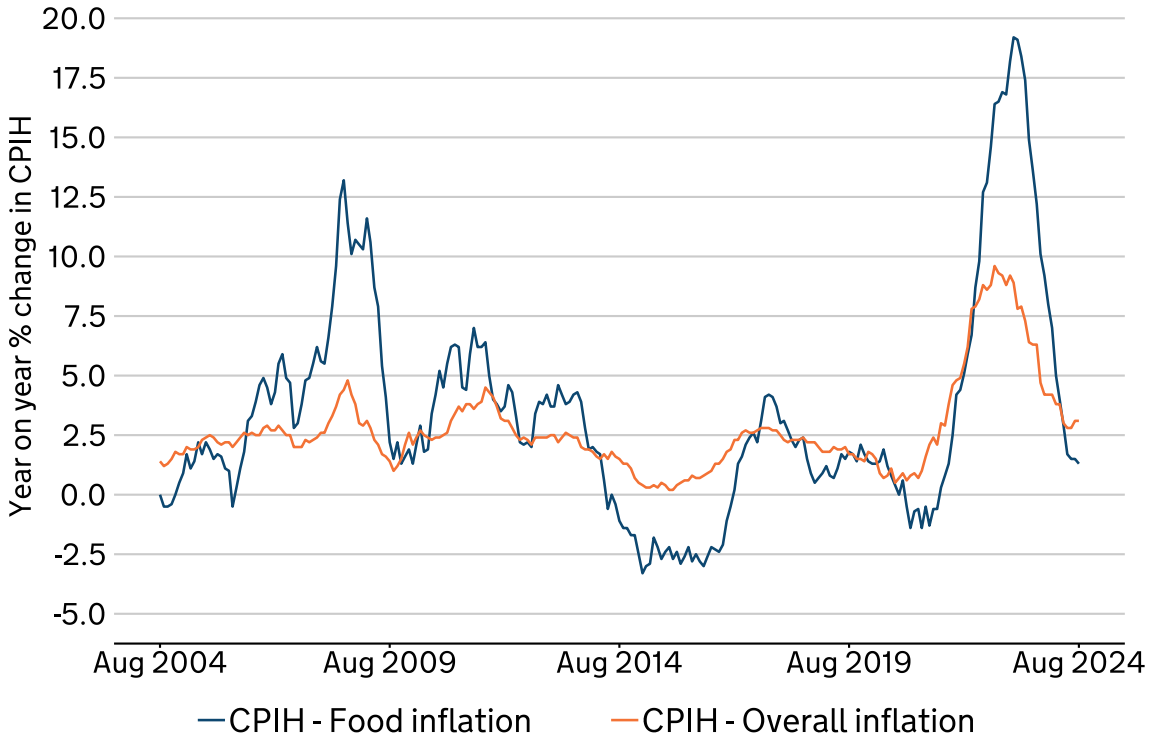
Rationale

This indicator monitors trends in the overall CPIH, which covers both the 'overall' rate of inflation and 'food and non-alcoholic beverages' inflation. The CPIH provides the most comprehensive measure of inflation as it includes a measure of the costs associated with owning, maintaining, and living in one's own home and Council Tax. It therefore enables an assessment of how food prices are changing in line with the purchasing power of households and is an important measure of the affordability of food. The price of food needs to be considered alongside cost pressures from other costs on the household food budget (see Indicator 4.1.2 Household spending on food for further detail).

Headline evidence

Figure 4.1.3a: Year on year percentage change in Consumer Prices Index including owner occupiers housing costs (CPIH), for 'overall' and 'food and non-alcoholic beverages', in the UK, August 2004 to August 2024

Source: Consumer price inflation, ONS



Since the beginning of 2021 there has been a substantial rise in both food and non-alcoholic beverages and overall (that is "all items") inflation, before they both began to fall in the second half of 2023. Food and non-alcoholic beverages CPIH inflation peaked in March 2023 at 19.2% while overall CPIH inflation peaked in October 2022 at 9.6%. This was the highest annual rate in food inflation seen in 45 years and represented a larger gap between food inflation and overall inflation than 45 years ago. Supporting evidence shows that the biggest percentage increase was seen in the milk, cheese and eggs, and vegetables food groups and that some groups are disproportionately affected by higher food costs and price volatility, including people with a food hypersensitivity and lower-income households.

Supporting evidence

Between January 2021 and August 2024 UK food and non-alcoholic beverages prices increased by 31.6%, which was over three times more than in the preceding decade (January 2011 to January 2021, 9.5%) (Figure 4.1.3a). Food price inflation rose for 20 consecutive months, peaking at 19.2% in March 2023. During this

period, it surpassed overall inflation in May 2022. The spike in food price inflation was driven by Russia's invasion of Ukraine that led to rising energy prices, in turn affecting fertiliser and farming input costs. This became the main driver of food price inflation as it increased the costs for both food producers and manufacturers. The impact of input prices on food prices is covered in further detail in Theme 3 Indicator 3.1.5 Energy. After March 2023, year on year food and non-alcoholic beverages price inflation (hereafter referred to as 'food price inflation') fell consistently to stabilise at 1.3% in August 2024 (Figure 4.1.3a).

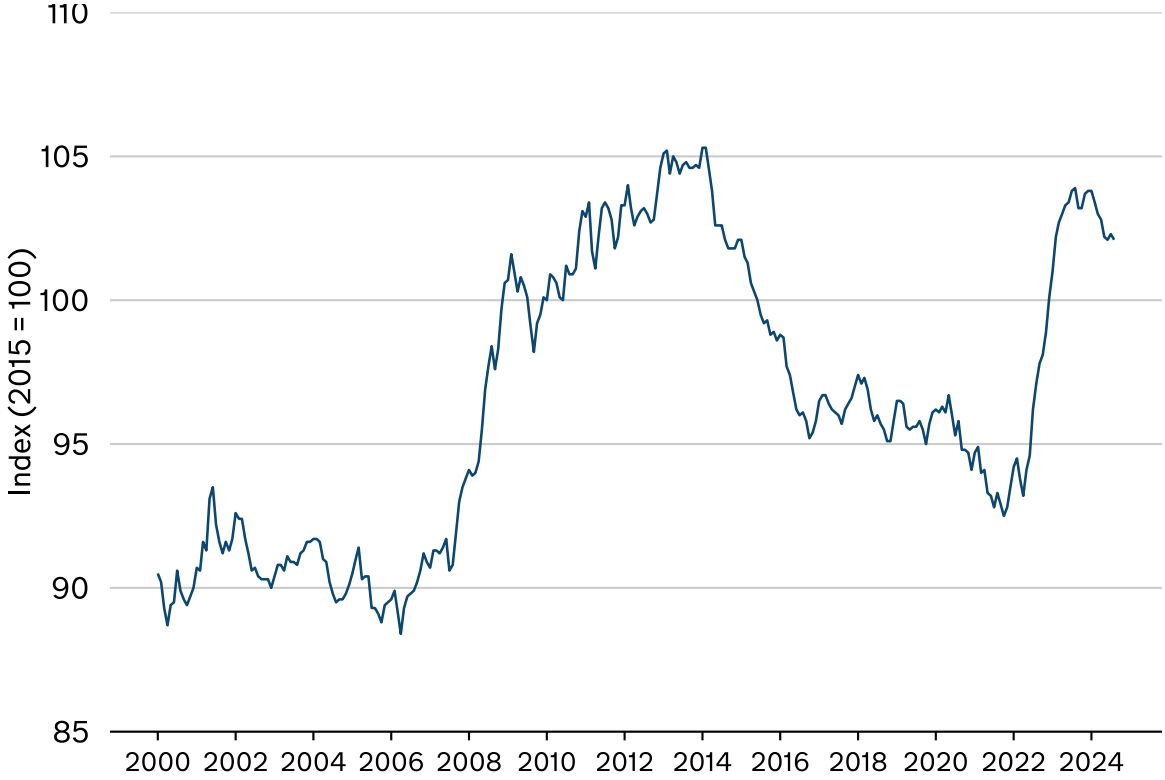
A range of factors in addition to energy and inputs to food production had a cumulative impact on food price inflation over this period, including labour costs, extreme weather events and trade barriers (see Theme 3 Indicator 3.1.5 Energy for further detail).

Food price changes

Data in real terms shows how food prices have evolved once the impact of underlying, overall inflation is taken into account. This is another way of looking at the data in the headline evidence. Where food prices increase by more than prices generally across the economy, then real terms food and non-alcoholic beverage prices would rise and visa-versa. This hence gives an indication of when food prices are growing quicker or slower than all other prices.

Figure 4.1.3b: Changes in the food price index (real terms prices), January 2000 to August 2024

Source: Consumer price inflation, ONS



Over the last two decades, food price levels in real terms (relative to prices across the economy) have had two notable ‘spikes’, in 2008 and 2022. These values are derived from ONS CPIH index values for overall and food and non-alcoholic beverage inflation (Figure 4.1.3b). Index values were at their lowest in 2006 and rose soon after due to the 2008 financial crisis, peaking in 2014. Over those 8 years real terms food price levels rose by 19%. Real terms food price levels then fell between 2014 and 2016 and remained quite stable until a sharp rise from 2022 onwards. Food price levels in real terms then decreased by 1.7% in the 12 months from August 2023 to August 2024.

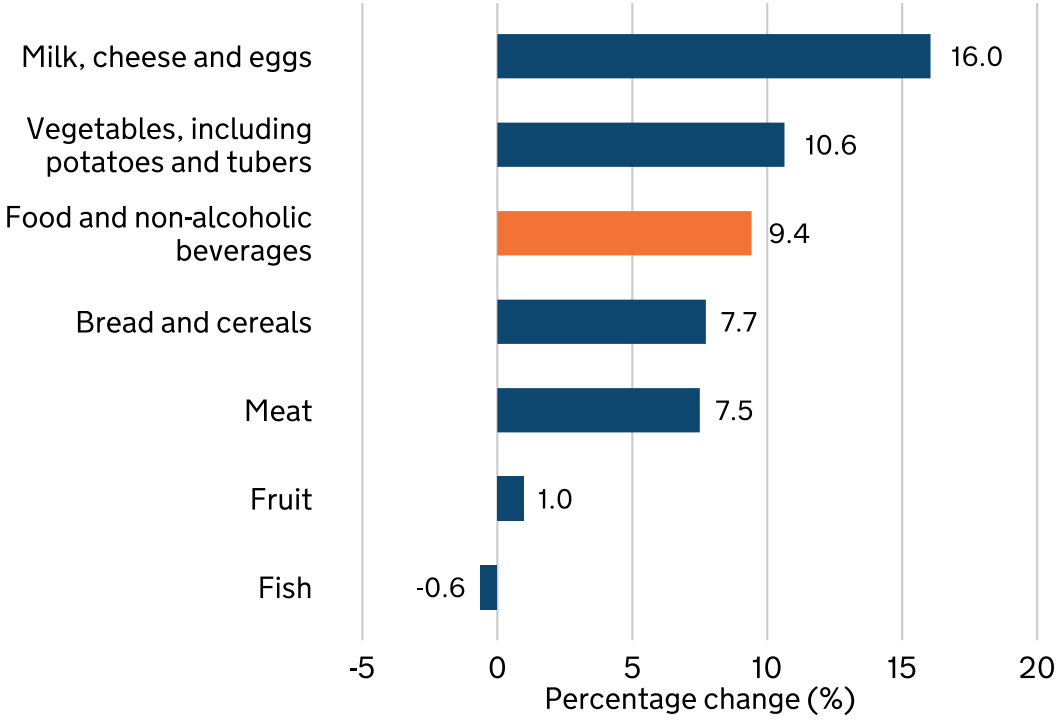
While food prices are generally increasing at a relatively low level most of the time, food price inflation has been subject to a few “spikes” over the last 20 years. Food price inflation normally varies within the range of 0% to 5%, with over 60% of the year-on-year food price inflation rates reported on a monthly basis since the start of 1989 falling into that range. However, food price inflation over the last 20 years has seen rates significantly over the 5% level. The most recent spike witnessed in 2022 and 2023, driven by Russia’s invasion of Ukraine, was the largest of those, with food prices rising by over 30% in the three years preceding March 2024. Although this was the largest inflation spike, the highest real terms peak was in 2014, after the 2008 financial crisis.

As a large spike in real prices, the spike between 2022 and 2023 will have affected all household budgets, with food and non-alcoholic beverages accounting for over 11% of household expenditure (see Indicator 4.1.2 Household spending on food). The challenge will have been particularly acute for low-income households, where that proportion rises to 14% for households in the lowest two income deciles. As discussed in Indicator 4.1.2 Household spending on food, there is evidence that households have responded to higher prices of food items by reducing expenditure. This has included moving to lower price versions of products. Products bought in supermarkets can be grouped into branded (meaning named brands owned by suppliers to the retailers) and own label (products badged with the name of the retailer they are sold in), sometimes called private label. Own label products are often cheaper than their branded equivalents and so to save money shoppers may swap from branded to own label. One recent report published by the Department for Environment, Food and Rural Affairs (Defra) on food purchases and price inflation showed that the average price per unit of branded items in the food, drink and alcohol market was £2.08 in the 12 weeks to March 2023, as compared with £1.61 for own label items. From the 1st quarter of 2022 to the 1st quarter of 2023 the market share of branded products dropped by 2%, with value own label growing the most in this time period. This means shoppers moved some of their spend to own label goods possibly as a means of saving money.

Food price changes by food group

Figure 4.1.3c: Percentage change in real terms prices in the UK between August 2021 and August 2024, food product classes

Source: ONS Consumer price inflation



Relative to the overall value for food and non-alcoholic beverages, the milk, cheese and eggs, and vegetables food groups showed the biggest percentage increase in real terms prices (generated through the use of ONS CPIH index values for food and non-alcoholic beverages deflated with equivalent overall index values) over the last 3 years from August 2021 to August 2024 (Figure 4.1.3c). In addition to the food groups shown in Figure 4.1.3c, percentage change in real terms prices values for oils and fats (33.2%) and food products (not elsewhere classified, for example, soups, ready cooked meals and sauces, 21.8%) were the food categories that saw the largest increases in price during this time period. The affordability of a healthy diet is covered in further detail in Indicator 4.3.2 Healthy diet.

Food price impacts on different population groups

Food costs are likely to be higher for some population groups. Some recent evidence suggests that the lowest-priced items saw some of the highest inflation rates in the last recorded year of data, with worse impacts expected for lower-income households. ONS analysis of web scraped price data of the lowest-cost products for 30 everyday items and how they changed in the 12 months to September 2022 shows that the cost of the lowest-priced items increased by approximately 17% over the reported period. Nine items saw an increase of over 20%, with the most notable price rises being for vegetable oil (65%), pasta (60%) and tea (46%).

Since the 30 items were selected based on the highest expenditure and largest quantity bought by households in the lowest-equivalised income decile, these price rises are very likely to have affected the poorest households. It is worth noting that this data is highly experimental and has some limitations, though measures were taken to ensure the substitutability, comparability and range of items was considered to encapsulate a whole typical food basket purchased by shop goers.

Price volatility also has a disproportionate impact on lower-income households. A recent report by Defra found that those in social classes D and E (which covers semi-skilled and unskilled manual occupations, unemployed and the lowest grade occupations) had lower absolute take-home spend per household in the 12 weeks to March 2023. However, when this was compared with the 12 weeks to March 2022, these groups saw their take-home food, drink and alcohol spend increase quicker than other groups. The report attributes this to the fact that these groups were more exposed to inflation. This is supported by a 2024 report from the Food Foundation which discusses the larger impact of increasing costs of essentials on households with lower incomes due to the need for them to spend higher proportions of their earnings on these items.

Other population groups affected by higher food costs are disabled people and people with food hypersensitivities. Disabled people may have specific dietary requirements related to their condition which can often be more expensive. Depending on the nature of their disability, some disabled people have difficulties preparing food, leading to increased reliance on convenience food, which is comparatively more expensive than preparing meals from scratch. There is a notable higher share of household budget spent on food by disabled groups (see Indicator 4.1.2 Household spending on food).

Households where adults have a food hypersensitivity (FHS) such as a food allergy or intolerance, or coeliac disease, spend more on weekly food purchases than those households with no FHS. A study commissioned in December 2022 by the Food Standards Agency (FSA) to estimate the financial cost to FHS households found that on average, households with FHS spend an additional 12%

to 27% more on weekly food purchases. These FHS households also spend 40.37 days per year on FHS-related activities including researching, shopping for suitable items and discussing their FHS condition. Broken down by FHS groups, for every £1 spent on weekly groceries by non-FHS households, an FHS household spends an additional £0.14 for those with a food allergy, £0.12 for those with coeliac disease and £0.16 for those with food intolerance. Takeaway or eating out is more expensive for those with a food allergy who spend £0.27 more, and for those with coeliac disease who spend £0.14 more than the £1 spent by non-FHS households.

Climate impacts

Extreme weather events have contributed to recent inflation and are set to increase with climate change (see this study by the Energy and Climate Intelligence Unit for an analysis of the role of climate change in the recent inflation spike). The effect of climate change on food prices is expected to continue, which could have an impact on existing food inequalities. The Climate Change Committee's Climate Change Risk Assessment says that food price spikes as a result of climate change overseas may become increasingly likely. This is expected to have an impact on food inequalities as research by the Grantham Institute suggests that those with the fewest resources are the least able to adapt to climate change in general, as small changes in their income due to climate events (such as floods and rising temperatures) can result in overwhelming losses to welfare and livelihoods.

4.1.4 Government support schemes

Rationale

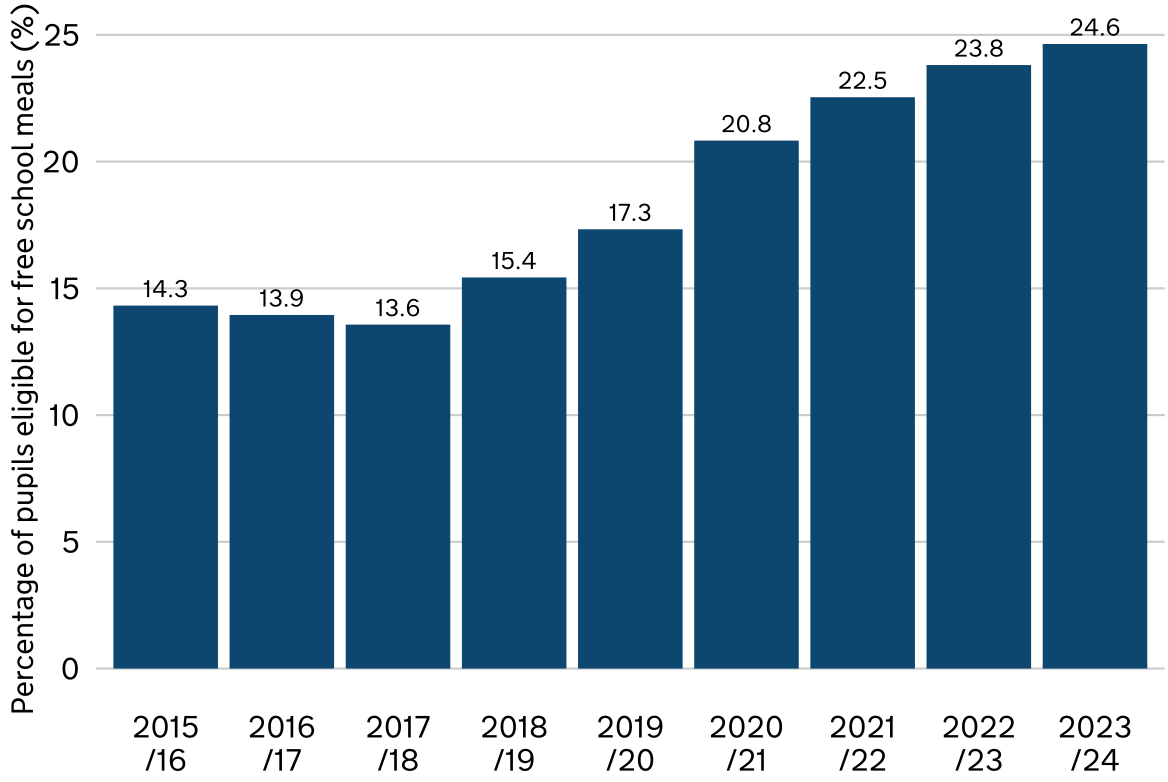
This indicator tracks trends in national food aid schemes led by government, both provision and usage, to measure the role government support plays as a lever in household food security, particularly for more vulnerable groups. It is important to acknowledge the role of wider government financial aid in supporting households to buy food, which is not covered in this indicator as the focus is on data that shows direct usage of aid to access food.

The headline statistic tracks Free School Meals (FSM), a programme intended to support learning and development by ensuring pupils do not miss out on a healthy and nutritious lunch due to financial constraints.

Headline evidence

Figure 4.1.4a: Percentage of pupils in England eligible for Free School Meals, academic years 2015/16 to 2023/24

Source: Schools, Pupils and their Characteristics, Department for Education



In the financial year 2023/24, 2.1 million children in England (24.6%) were eligible for FSM. This is an increase of nearly 200,000 pupils since FYE 2022, when 22.5% were eligible. Since FYE 2016 there has been an increase of just over 950,000 pupils eligible for FSM (up from 14.3%). Up until FYE 2018 each year there was a slight reduction in pupils eligible for FSM, but since FYE 2018 each year has seen an increase in the percentage. Data for take up of FSMs is not published.

The continuing year on year increase in the number and rate of pupils eligible for FSM (Figure 4.1.4a) reflects the continuation of the transitional protections, which ensures that households retain their entitlement to FSM, regardless of any change in circumstances, during the rollout of Universal Credit (until the end of the child's school phase). Therefore, there is an increasing number of pupils who are eligible for FSM, but protections mean pupils do not stop receiving FSMs in similar quantities. It is worth noting that the increase during the first year of the pandemic

(January 2020 to January 2021) was higher than each of the previous year on year increases.

Across different ethnicities eligibility for FSM in England varies greatly. In FYE 2023, 64.9% of White (Traveller of Irish heritage) pupils and 58.3% of White (Gypsy/Roma) pupils were eligible for FSM. These figures were higher than the average across pupils where eligibility was 24.6%. Only 7.3% of Asian (Indian) pupils were eligible for FSM followed by 7.5% of Asian (Chinese) pupils.

Figures represent the number of pupils recorded as FSM eligible across state-funded nursery, primary, secondary, alternative provision schools, special schools, and non-maintained special schools. This does not include infant pupils in receipt of Universal Infant Free School Meals.

The overall **uptake rate for FSM** across all school types in Scotland was 71.0% in 2024, down from 76.2% in 2020, and also well below the series peak of 85.0% in 2014.

(To note, in 2015, universal entitlement to FSM was introduced for pupils in P1 to P3. This universal entitlement was extended to all pupils in P4 in August 2021 and then to all pupils in P5 (aged 9) in January 2022.)

In Wales in FYE 2024 19.3% of pupils were **eligible for FSM**. This is slightly lower than in FYE 2021 when 21.3% of pupils were eligible.

(To note, pupils are eligible for FSM if their parents or guardians are in receipt of certain means-tested benefits or support payments. The COVID-19 pandemic may have impacted on the quality of this data and may have resulted in over recording of this data in 2020 to 2022. These figures do not include pupils who only receive FSM due to the universal primary FSM policy.)

In Northern Ireland, in FYE 2023, the percentage of children **eligible for FSM** was 27.7%, dropping slightly from FYE 2020 when it was 28.4%.

(To note, Income Support, income-based Jobseeker's Allowance, Employment Support Allowance (where an award of income-based job-seekers allowance has been converted and the amount of the award remains unchanged); and Universal Credit are some of the benefits which determine eligibility for FSM. As school meals are not universally available to children in pre-school education, parental receipt of these benefits is a better indicator of social disadvantage for the pre-school sector.)

Supporting evidence shows that some groups may not have access to FSM, such as children with disabilities and children in food insecure families who do not receive means-tested benefits. Trends across other food aid schemes are also covered, including: Healthy Start vouchers, which help pregnant or young parents

buy healthy food and milk; the Household Support Fund (HSF), which supports vulnerable households get essentials over winter; and the Holiday Activities and Food (HAF) programme, which works to support disadvantaged families by providing healthy meals during the school holidays.

Supporting evidence

Free school meals

As the FSM programme is a means-tested scheme with eligibility criteria, these figures do not track the experience of household food security across some groups who are not eligible. These include families who experience food insecurity but do not receive means-tested benefits and households on Universal Credit who have higher earnings. The Child Poverty Action Group estimates that a third of school-age children in England (900,000) living in poverty are not eligible for FSM based on data for the academic year from 2022 to 2023. They argued on the basis of this that the eligibility threshold used for means-testing was too restrictive. Evidence gaps exist in terms of both the exact number of children who are food insecure and are not eligible for FSM as well as the take up of the scheme across eligible groups.

Despite meeting the eligibility requirements based on income, the Food Foundation estimates that a third of children (33%) with disabilities also miss out on FSM due to their specific dietary requirements, sensory processing difficulties or not being able to attend school. This increased the financial pressures on weekly budgets for 85% of those families affected. In March 2024, the Department for Education updated its guidance to clarify that schools have an existing legal duty to make reasonable adjustments for disabled children so that they are not put at a substantial disadvantage compared to their non-disabled peers. This duty applies to food provision including FSM.

Healthy Start schemes

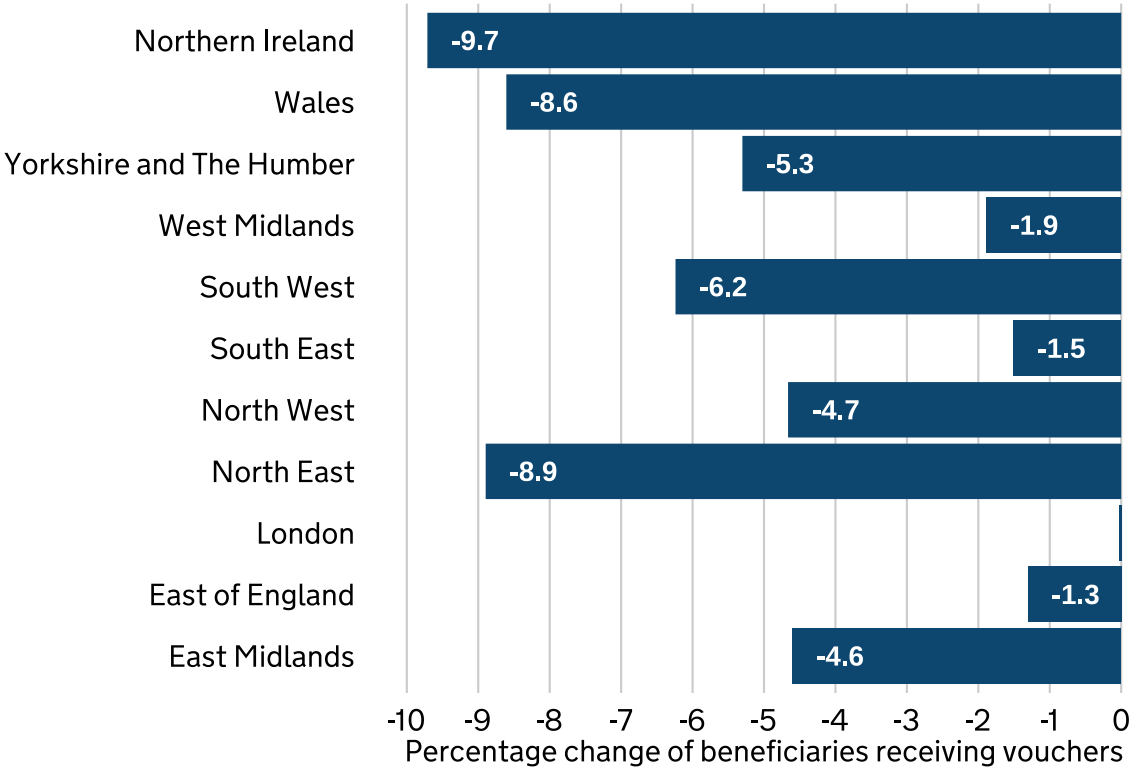
The Healthy Start scheme was introduced in 2006 to encourage a healthy diet for pregnant women, babies, and young children under four from very low-income households. Healthy Start has now completed the transition to a card-based system where those on the scheme receive a pre-paid card. The card is loaded up every four weeks with the funds they are entitled too. It can be used to buy, or put towards the cost of, fruit, vegetables, pulses, milk, and infant formula. Healthy Start beneficiaries have access to free Healthy Start Vitamins for pregnant women and children aged under four.

The NHS Business Service Authority website for Healthy Start publishes the number of people on the digital scheme (formerly called ‘entitled beneficiaries’).

This includes the number of children under the age of 4 and the number of pregnancies over 10 weeks.

Figure 4.1.4b: Percentage change in the number of people receiving Healthy Start vouchers in English regions, Wales and Northern Ireland, between 2022 to 2024

Source: Healthy Start, NHS Business Services Authority



Between February 2022 and February 2024 all English regions and Wales and Northern Ireland saw a decrease in the number of people (beneficiaries) receiving Healthy Start vouchers except for London which stayed the same at about 50,700 beneficiaries (Figure 4.1.4b). Northern Ireland saw the largest decrease of beneficiaries of 9.7%, reducing from about 12,300 to 11,100, followed by the North East with a decrease of 8.9% (from about 23,100 to 21,000) and Wales with a decrease of 8.6% (from about 22,400 down to 20,500).

The size of the "Unknown" category, which accounts for postcodes that are incorrect or unclassified, increased by 164%. This rise may be due to inaccuracies in the source data, leading to a higher number of beneficiaries being reported under 'unknown' postcodes. Overall, this data reflects a general downward trend in program participation during this period.

Due to a data quality issue the data on the number of people eligible (those who are entitled to them if they would like them) for Healthy Start vouchers and the take up rate of the vouchers (the percentage of people who receive the vouchers out of those who are eligible) are unavailable from January 2023. It is not possible to see the proportion of people eligible for Healthy Start vouchers who are actually receiving them.

Changes to uptake of the scheme can reflect different causal factors. Low uptake may indicate a lack of awareness of the scheme, stigma surrounding the claiming of help through the scheme, or barriers to take-up among people who need it, such as the application process (Barrett, Spires and Vogel, 2024; Browne, Dundas and Wight, 2016; Jessiman and others, 2013). High levels of use may reflect a drive among people who are particularly in need to use it. Evidence to date is unclear of the impact of Healthy Start on food insecurity (Parnham and others, 2021).

In Scotland, Best Start Foods is a payment that can help buy healthy foods like milk or fruit during pregnancy and when your child is under 3. Payments are made every 4 weeks and range between £21.20 during pregnancy and when the child is between 1 and 3 years old and £42.40 when the child is between 0 and 1 years old.

In FYE 2024 there were 44,890 applications for Best Start Foods, decreasing 25% from 59,780 in FYE 2022. In FYE 2024 there were 43,560 individuals who received Best Start Foods payments, a decrease of 12% from 49,435 in FYE 2022. The number of payments made in FYE 2024 was 398,760, totalling £12,606,092. Both payments and value decreased from FYE 2022, by 14% and 8% respectively.

Household Support Fund (HSF)

The HSF was introduced on 30 September 2021 to help vulnerable households in England with essentials over the winter. The HSF is distributed by councils in England to directly help those who need it most. The grant is distributed through small payments to households to assist with meeting daily needs such as food, clothing, and utilities. The Fund has been extended to April 2025.

In the period from 1 April 2023 to 31 March 2024, £842 million was made available across local authorities in England. Over 19.5 million awards were made by local authorities to households. Of the £842 million, 39% was awarded to support households in the school holidays by providing them with FSM support, while 24% was to help with other food costs (not FSM support). 65% of the funding went to households with children, 11% to households with pensioners and 11% to households with a disabled person.

Councils decide individually how to run their schemes. They may differ in eligibility criteria, application processes and who money is awarded to. For this reason, only national data is being included.

Holiday Activities and Food (HAF) Programme

The HAF programme was first launched as a pilot by the Department for Education (DfE) in 2018. It was designed to support disadvantaged families during the school holidays by providing healthy meals and enriching activities to young people.

Findings in the evaluation of the 2021 HAF programme, including a survey of both families and clubs, show that:

- In 2021 730,000 children took part in the scheme across 151 English local authorities, of whom 616,000 children had their places directly funded by HAF and 498,000 were eligible for free school meals. 76% (556,000) were primary school children, while 24% (174,000) were secondary school aged.
- 93% of clubs provided at least one healthy meal (meeting the School Food Standards) every club day.
- Two thirds (67%) of families with a child attending HAF had a home address in one of the 30% most deprived areas on the Index of Multiple Deprivation.
- 53% of children attending were ethnically White-British, with smaller representation reported for Black African (9%), Pakistani (5%), Bangladeshi (5%), White and Black Caribbean (5%), and less than 5% from other ethnic groups.
- 22% of clubs reported having to turn some children away in 2021, suggesting some level of unmet demand.

4.1.5 Food aid

Rationale

The food aid landscape refers to a broad range of measures that provide food to people in need. These include formal food banks (from the Trussell Trust and Independent Food Aid Network (IFAN)) and informal food banks, social supermarkets and pantries, and community cafes, kitchens and gardening initiatives. Existing data sources are unlikely to capture the scale and diversity of the sector.

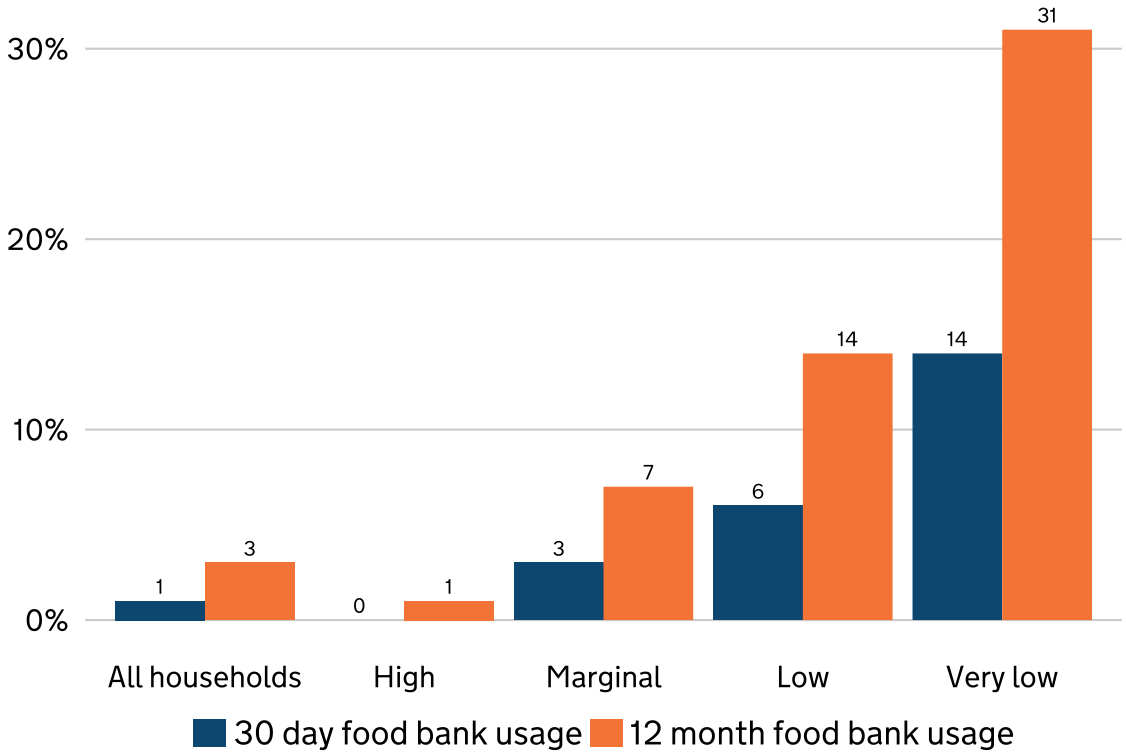
Across the community food sector, food support is provided by a wide range of models, with differing ways to alleviate food insecurity (Fair Food Futures, 2024). Some community food organisations provide food support to anyone, others target specific groups. Many are reliant on medium or short-term funding, including funds provided from the HSF (see Indicator 4.1.4 Government support schemes for more information on the fund), and many rely on surplus food distributed by charities or collected from supermarkets and local businesses.

This indicator uses data from the FRS and shows the percentage of households using a food bank in the last 30 days and 12 months. It is one useful indicator of households experiencing severe food insecurity and actively seeking assistance in response. It is thus a measure of lack of access to food and a reflection of the ability of people to access food banks and their willingness to do so.

Headline evidence

Figure 4.1.5a: Percentage of households who have used a food bank in the last 30 days and 12 months by household food security status, UK, FYE 2023

Source: Family Resources Survey, DWP



Food banks have become more widespread in the UK since 2010 (Loopstra and Lambie-Mumford, 2023). However, this is not proportional to increases in higher levels of food insecurity.

Data from DWP's FRS shows that in FYE 2023, 3.3% of all households used a food bank in the last 12 months, while 1.4% used one in the last 30 days. These figures are higher for households with 'low' and 'very low' household food security at 14% and 31% respectively using a food bank in the last 12 months. Only 1% of households with 'high' household food security used a food bank in the last 12 months.

This marks a moderate increase in food bank usage from FYE 2022. The rate of households using a food bank in the last 30 days increased from 0.9% of households to 1.4%, and households using one in the last 12 months increased from 3.0% to 3.3% of households.

Data from the FSA's Food and You 2 survey, conducted across England, Wales and Northern Ireland, suggests that food bank usage has declined following a peak in 2020 during the COVID-19 pandemic. In Wave 2 of the survey (November 2020 to January 2021) 6% of online respondents said they had used a food bank or other emergency food provider in the last 12 months. However, this fell to 3% in Wave 6 (October 2022 to January 2023). While data from the Food and You 2 survey provides wider context to the change recorded between FYE 2022 and FYE 2023 in the FRS, these datasets are not comparable given the different time periods covered. Further information on their respective methodologies can be found in Indicator 4.1.1 Household food security status.

While data shows a notable increase in food insecurity (see Indicator 4.1.1), there has been a more moderate increase by contrast in food bank usage for FYE 2023. This would suggest that many food insecure people do not use food banks. For example, the FSA's Consumer Insights Tracker records a stable percentage of people using food banks between August 2023 and June 2024. While there is some overlap in figures on food insecurity and food bank usage, these numbers do not always correspond to each other. According to the Trussell Trust, more than two thirds of those experiencing food insecurity have not received food aid.

Supporting evidence shows that young people and those on low incomes continue to use food banks disproportionately compared to other demographics. Other key risk factors leading people to use food banks include being in receipt of some means-tested benefits, having a disability, living alone or in a single parent household, living in rented housing or experiencing homelessness.

Supporting evidence

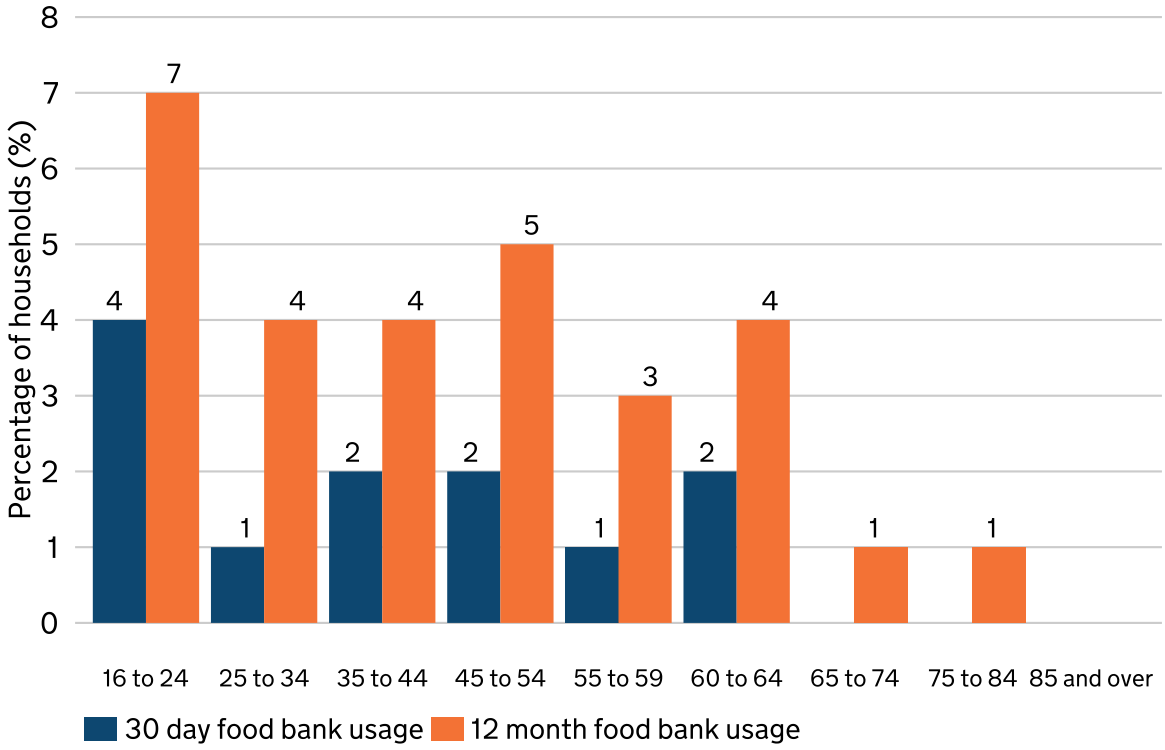
Demographics

While the demographic profile of people using food banks is complex, some groups are over-represented when compared to the UK population on average. Data from the Trussell Trust network shows that working age adults (aged 18 to 64), particularly those in receipt of means-tested benefits and or living alone, disabled people and households with children are more likely to use a food bank. Food bank usage is also strongly associated with rented housing and homelessness, with some people more likely to have experienced a form of homelessness in the past year and have needed to turn to a food bank for support, such as those who have ever sought or applied for asylum and young people. Those facing structural inequalities, such as people from ethnic minority groups, women, asylum seekers and people who were in care as a child are also more likely to use food aid. As many of these factors intersect, individuals facing multiple disadvantages may be more likely to use food aid.

Age

Figure 4.1.5b: Household food bank usage by age of head of household in the UK, FYE 2022 to FYE 2023

Source: Family Resources Survey, DWP



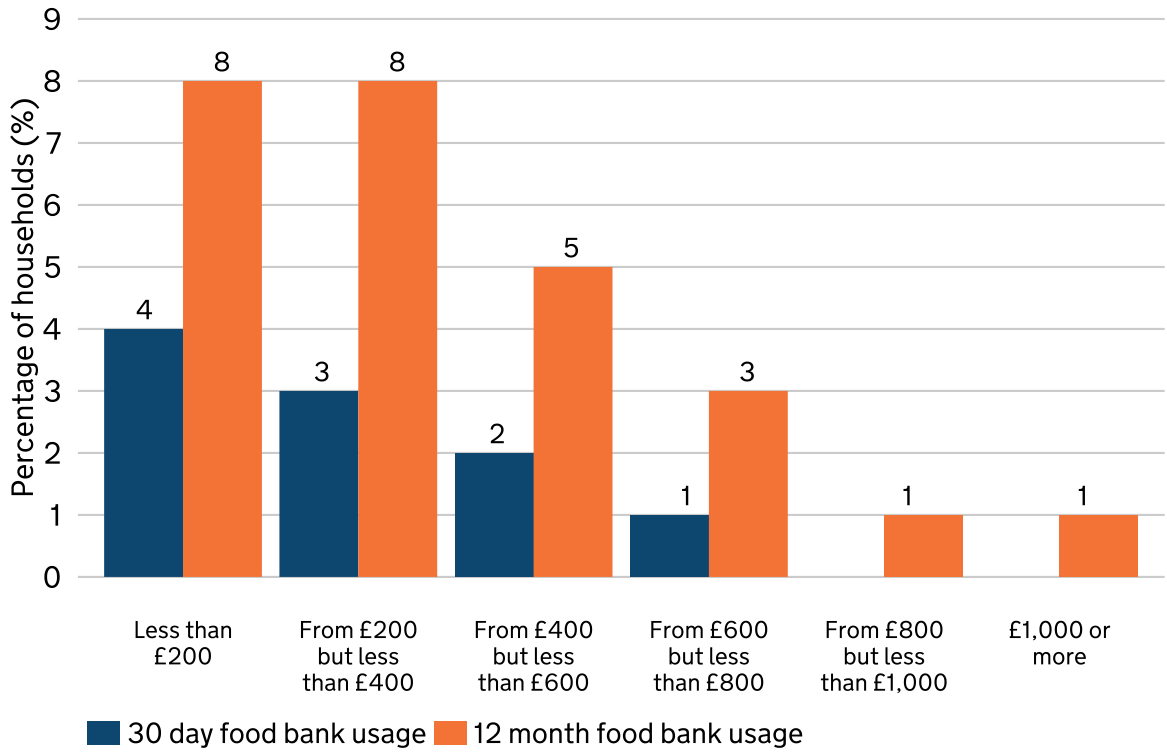
Note: missing bars are the result of there being less than 0.1 million households or the percentage being less than 0.5%.

Young people use food banks disproportionately compared to older age groups. Food bank usage was highest in FYE 2023 for both recall periods in households headed by a 16 to 24 year old, with 7% of households using a food bank in the last 12 months, and 4% using one in the last 30 days (Figure 4.1.5b). The usage of food banks then declines for households headed by people from 25 to 34 years old, but rises again with 5% of households headed by 45 to 54 year olds using a food bank in the last 12 months and 2% using one in the last 30 days. For households headed by someone aged over 65 years old, only 1% used a food bank in the last 12 months and less than 0.5% in the last 30 days.

Income

Figure 4.1.5c: Household food bank usage by total gross weekly income in the UK, FYE 2022 to FYE 2023

Source: Family Resources Survey, DWP



Those on low incomes use food banks disproportionately compared to higher-income groups. Food bank usage was highest in the last 30 days, and the last 12 months, in households with the lowest total gross weekly income in FYE 2023 (Figure 4.1.5c). 8% of households with a weekly income of less than £200 a week, and from £200 to £400 a week, used a food bank in the last 12 months. Within the last 30 days 4% of households with less than £200 a week income used a food bank, while 3% of households with a weekly income between £200 and £400 used a food bank. In households with £800 a week or more, food bank usage in the last 30 days was less than 0.5%.

Disability

Disabled people have a disproportionate reliance on food banks. Research by the Trussell Trust found that 69% of those referred to Trussell Trust food banks, and 48% of those experiencing food insecurity, are disabled people (including mental, physical and learning disabilities), compared to 26% across the general

population. This is despite the fact that food banks are often not able to meet the needs of disabled people with physical barriers to access and less capacity to cater to specific dietary requirements (Food Foundation, 2023).

Food parcels

Trussell Trust food banks distributed 3.12 million food parcels in FYE 2024, a 4% increase on FYE 2023. This is the highest number of parcels distributed within one year by the network since records began in FYE 2019. Over the last 4 years, since FYE 2020, there has been a 63% increase in the number of Trussel Trust parcels distributed. Within FYE 2024 over 1.14 million parcels were distributed to children and almost 2 million to adults. It is worth noting that this data covers the number of parcels distributed, not people receiving them, so one person could receive many parcels within this data. While the Trussell Trust network represents the majority of food banks in the UK, they do not cover all of the food bank and food aid networks and are a partial representation of the need for food banks across the UK. There is a wide range of charitable food aid that will be supporting people that is not captured in this parcel data.

The rising cost of living has meant an increase in first-time use of food banks. A parliamentary research briefing, Food Banks in the UK, reported that the Trussell Trust saw a 37% increase in demand for food parcels between FYE 2022 and FYE 2023 and another 4% increase between FYE 2023 and FYE 2024, with 760,000 people in FYE 2023 and over 655,000 people in FYE 2024 using a food bank for the first time. Northern Ireland saw the largest increase in the number of parcels distributed in the year ending FYE 2024 with an 11% increase. England increased by 5% and Wales by 1% while Scotland saw a decrease in parcels of 0.1%.

Number of food banks

In terms of the number of food banks, in FYE 2024 the Trussell Trust operated 1,699 food banks across the UK while there were at least 1,172 other food banks mapped by IFAN. This does not include food banks operating from schools.

Food bank referrals

Data from food bank referrals shows demand for food bank support has continued to increase since 2019, and while an underestimate of the scale of demand, highlights the growth across certain population groups, including disabled people and single people.

In June 2024 in England and Wales there were 17,131 referrals by Citizens Advice for food bank parcels, equivalent to helping an average of 856 people every day with food bank referrals. In the last 5 years there has been a 253% increase in referrals by Citizens Advice, from 4,859 in June 2019.

In June 2024 over half of referrals (8,953 referrals) were made for people with a disability or long-term health condition. This figure has increased by 226% from 2,747 in June 2019.

In June 2024, just over a third of referrals (6,131 referrals) were for a single person, while around 20% (3,341 referrals) were made for a single person with children. Couples were less likely to be helped with a food bank referral, with 1,524 couples with children referred (9%) and 709 couples without children (4%) also referred for food bank parcels in June 2024.

It is worth noting that many food banks do not require a referral for someone to use their services and Citizen's Advice is only one referral agent. Therefore, the numbers are highly likely to underestimate the scale and range of demand but remain useful as time trend data which reflect wider trends in demand for food bank support.

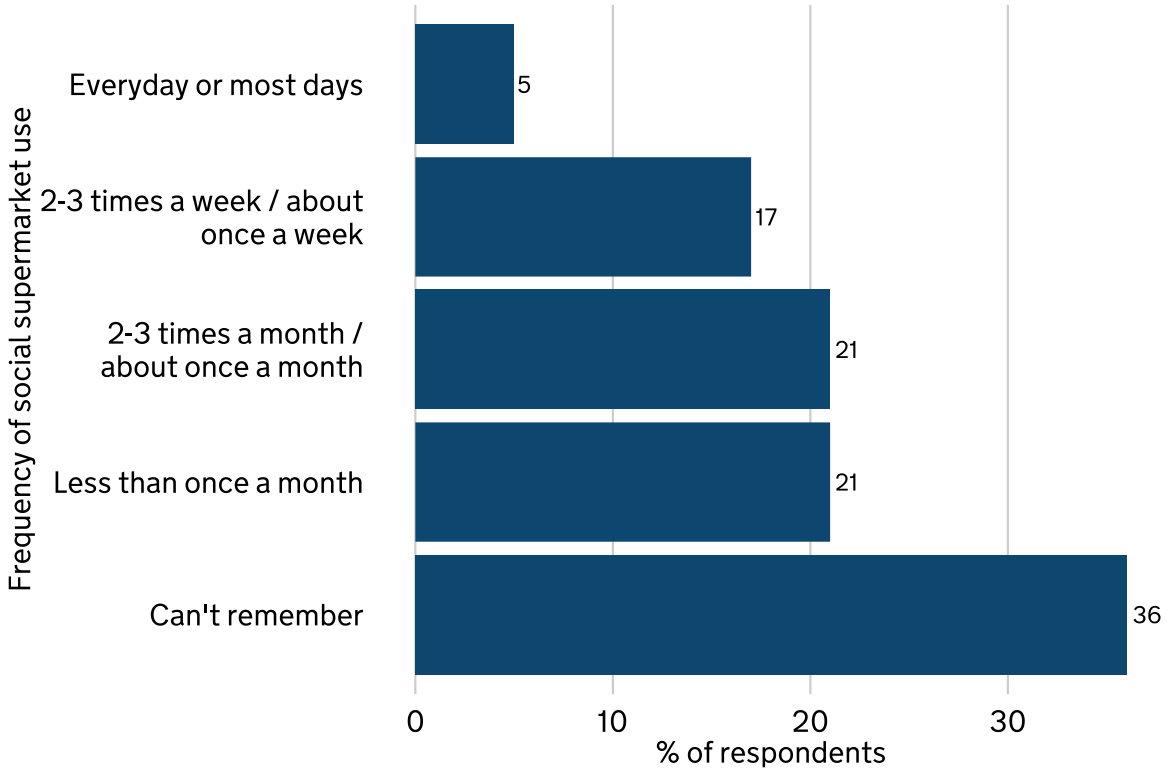
Social supermarkets

Outlets for buying discounted produce that may have been saved from going to waste, like a social supermarket, food club or community larder, are usually community run and can broaden access to food aid for those not eligible for food banks. Research carried out by the FSA published in 2024 found that one in 20 (5%) respondents reported they had used a social supermarket in the last 12 months, with 14% of respondents not being familiar with the term. In this study social supermarkets, also known as food clubs, hubs or community pantries, were defined as places that allow people to buy food items at a heavily discounted price, or as part of membership. They were described as community organisations that are different from food banks as they offer a choice of food, provide a retail-like environment and may provide social support (FSA, 2024).

Respondents with very low food security (17%) were more likely to use social supermarkets, than those with low (7%) or marginal (6%) food security. Those who were long-term unemployed and/or had never worked (14%), on an income of less than £19,000 (12%), in households with children under 16 years (8%) were more likely to have used a social supermarket compared to other groups (FSA, 2024). Those living in the North-West of England (10%), Greater London (7%), and the North-East of England (7%) were also more likely to use have used a social supermarket compared to other regions, such as the East of England (1%).

Figure 4.1.5d: Frequency that households used a social supermarket in the last 12 months, in England, Wales and Northern Ireland. April to July 2023.

Source: Wave 7 of Food and You 2 Survey, FSA



For those respondents that use social supermarkets, 17% did so weekly, while 21% did so monthly and 21% did so less than once a month; 36% of respondents could not remember how often they had used one in the last 12 months (Figure 4.1.5d). This suggests that people use social supermarkets more regularly compared to food banks (see Figure 4.1.5a), showing that people use varied types of food aid in different ways.

Quality of food provision

There is diversity in the type of food available at different food aid providers. Many community food organisations rely on surplus food distributed by charities or collected from supermarkets and local businesses, but this supply of food is unpredictable in terms of volume, frequency and quality (Fair Food Futures, 2024).

Data on food aid provision shows this can affect access to a healthy diet. In general food bank parcels do not provide a balanced, healthy diet for those requiring emergency food (Fallaize and others, 2020; Oldroyd and others, 2022). Some distributors have made efforts to address this: Trussell Trust food parcels

have included perishable items since 2018 (House of Commons Library, 2024) and more than a third of what FareShare, one of the largest redistributors in the UK, redistributes is fruit and vegetables (FareShare, 2023). Further information on what constitutes a healthy diet is covered in Indicator 4.3.2 Healthy diet.

Barriers to food aid

The role food banks play in the food insecure population is complex and sometimes limited. Research by Loopstra and Lambie-Mumford (2023) shows that while food insecurity drives food bank use, the likelihood of someone who is food insecure receiving help from a food bank is impacted by two main groups of factors: (1) individual-level factors relating to the circumstances and feelings about food bank use among people experiencing food insecurity, such as feelings of shame and the use of informal support network; and (2) the landscape and operational features of the local community food and support sector, such as the availability and physical accessibility of food banks.

According to the Trussell Trust, additional factors such as the accessibility of services to people from ethnic minority backgrounds and sources of other food aid can also impact the number of people being referred. In addition, there is no guarantee that food provided by food banks will match individual or cultural preferences. There is a significant issue with the provision of culturally appropriate food suitable for different ethnic and religious groups across food banks (Food Foundation, 2022; Power and others, 2017). There have also been reports of accessibility issues, with only some food aid providers being able to cater to food needs.

These barriers in part stem from challenges in the food aid supply chain, including limited resources, operational inefficiencies and high logistics costs, which can exacerbate people's access to food aid with implications for the viability, sustainability and ethics of food aid (Sawyerr and others, 2024).

Further research is needed to better understand the impact of barriers to food aid for different groups, such as the relationships between austerity, food insecurity and food banking in rural areas (May and others, 2020).

Limitations of food aid data

While the above data tracks changes in levels of food aid usage, these figures may underestimate food insecurity, including the most severe experiences in the population. Widespread use of proxy data to estimate levels of food insecurity, including tracking the distribution of food parcels from food banks, while available and comparable, can result in inaccurate assessments of local levels of food insecurity (Food Aid Network, 2022). Data on food bank usage remains limited with long-term quantitative data on the impacts of food bank use and food insecurity especially lacking (Loopstra and Lambie-Mumford, 2023). Other limitations of the data include: lack of standardised measurements across all food banks, for example across people, the number of parcels and size of parcels; incomplete coverage of all food banks and food parcel distribution activities in one area; and barriers to accessing food banks which mean only people who are able to access and use food banks are recorded.

The above figures also mask changes in the number and type of food aid providers, which has seen a marked shift since the COVID-19 pandemic (Benchekroun and others, 2024; All-Party Parliamentary Group on Ending the Need for Food Banks, 2023). During and since the pandemic, there has been a rapid expansion in the number and range of organisations providing food assistance in some way. For example, the number of food pantries in the Your Local Pantry network, one food club model, has risen by a fifth between 2023 and 2024 and now has more than 120 Pantries spread across the UK. However, many of these newer organisations operate informally and largely do not collect data on those using their services. There is scope for research to better understand how other forms of food aid compared to food banks are used, and which forms of food aid may be more accessible compared to food banks.

Sub-theme 2: Access to food shops

4.2.1 Physical access to food shops

Rationale

This indicator shows the average distance travelled for all food shopping by region to monitor the ability of English consumers to physically access food shops. In this context, food shopping trips include all trips to shops, and from shops to home, even if there is no intention to buy.

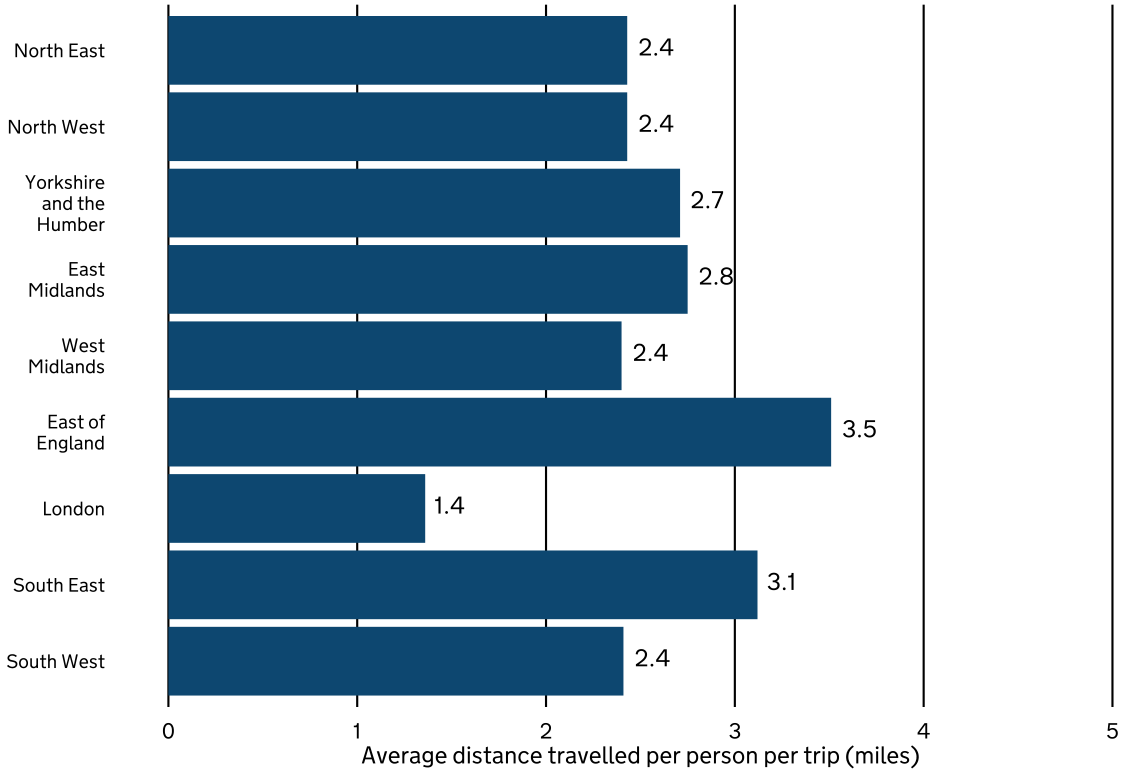
Food retailers play an integral role in the food system given their role in the community and potential to influence food choices (University of Cambridge Institute for Sustainability Leadership, 2024). Access to these stores implies being

better able to access good quality, affordable foods, all central tenets of being food secure. Households which are potentially vulnerable are those without access to a car or means of private transport, less mobile individuals such as disabled people or older people, and households in rural areas which typically have a more dispersed population and more limited public transport network.

Headline evidence

Figure 4.2.1a: Average distance travelled for food shopping by English region (miles per food shopping trip), 2022

Source: Underlying data from the National Travel Survey, Department for Transport



In 2022, people living in the East of England travelled the furthest per trip to buy food, averaging 3.51 miles per trip. This was followed by the South East, where people travelled an average of 3.12 miles. Conversely, Londoners travelled the shortest distance at 1.36 miles, followed by residents of the West Midlands, who averaged 2.4 miles per person.

Looking at the total distance travelled in a year, in the more rural regions of England the population is more likely to have to travel further to access facilities such as food stores. In urban conurbations people travelled only 142 miles per year to access food stores in 2022, while in rural villages, hamlets and isolated

dwellings they travelled 407 miles per year to buy food. The further a person has to travel, the more time it is likely to take to access food, the more costly it may be and the more risk there is of disruption.

In England since FYE 2003 there has been a substantial decrease of 24% in the distance travelled to buy food in a year, decreasing from 288 miles per year in FYE 2003 to 218 miles in 2022, peaking at 330 miles in FYE 2006. (The data switched to calendar year in 2020.)

Figure 4.2.1a only covers England and there is not equivalent data for the rest of the UK. However, the Scottish Government's publication Rural Scotland Key Facts 2021 estimates that in Scotland in 2020, only 69% of the population living in remote rural locations were within a 15-minute drive of a shopping centre, while only 29% were when using public transport. 92% of those living in accessible rural locations could reach a shopping centre within a 15-minute drive, while 22% could on public transport. This is understandable as some areas of Scotland have a low population density and people would therefore need a longer travel time to reach services.

Analysis using source data from Figure 4.2.1b and geographical area data from ONS Geography Portal shows that within the countries/regions of the UK supermarket density is lowest in Scotland and highest in London.

Supporting evidence shows that at the UK-level most home-consumed food is sold through supermarket retailers, with a similar pattern of the most supermarkets per person being located in the South East region of England. However, some vulnerable groups, such as disabled and older people, are more likely to have difficulty accessing food shops or face physical challenges in accessing them.

Supporting evidence

Levels of food insecurity vary across the UK, with the greatest variation visible in England. Further information on the geographic distribution of food insecurity across the UK is available in this map which provides estimates of three different measures of adult food insecurity based on survey data commissioned by the Food Foundation conducted in January 2021 by YouGov.

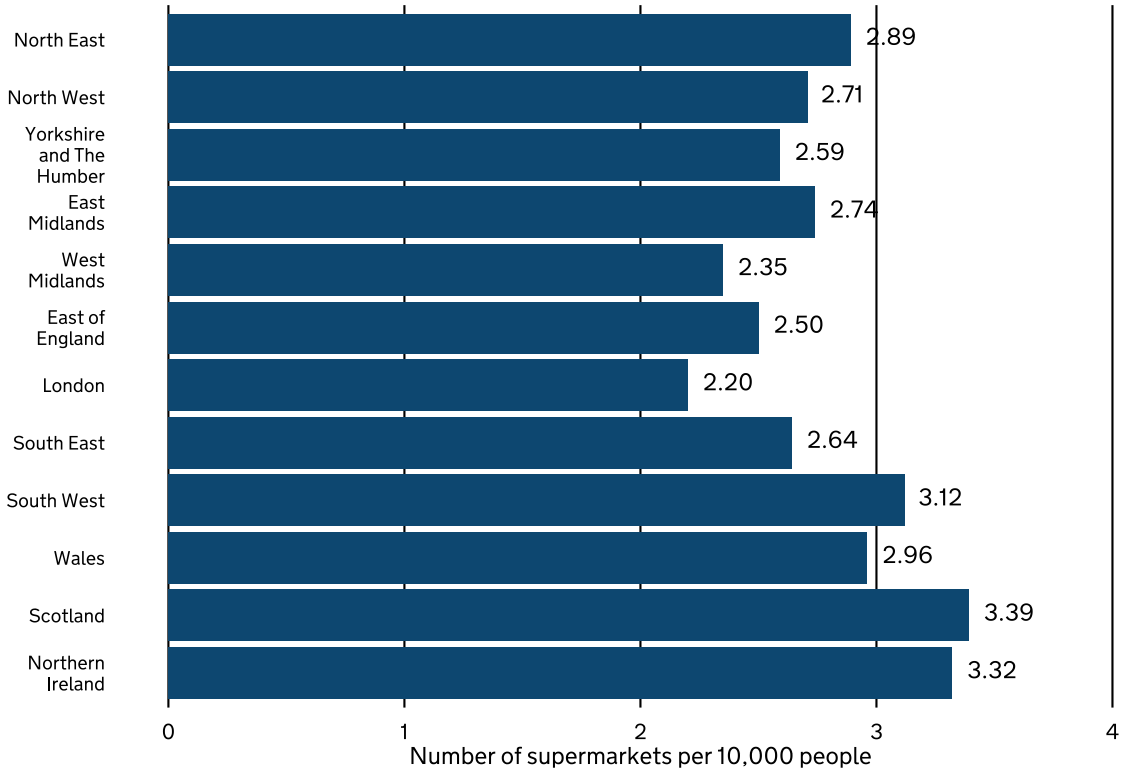
Availability of supermarkets

According to data from Kantar's Worldpanel Take Home GMS data from 12 w/e 3rd November 2024, over 90% of food purchased for preparation in the home in Great Britain is sold through supermarket and discount retailers. The rest of these sales comprise "Other Outlets" (which include smaller multiple outlets such as Farmfoods and Booth s) and "Symbols and Independent" stores (such as SPAR and Londis). The last 15 years has seen a growth in the grocery market share for discounters (such as Aldi and Lidl) and particularly increased after food, drink and alcohol inflation began to rise in 2022 (this is covered in further detail in Indicator 4.1.3 Price changes of main food groups). In the first quarter of 2023 discounters held 22.8% of overall market share.

Access to supermarkets is important given that fewer affordable food options are available in smaller food shops. A study conducted by Which? in 2023 found that the majority of small local stores assessed did not stock essential budget line items, meaning that the cheapest options are not available to people reliant on their local shops.

Figure 4.2.1b: Number of supermarkets per 10,000 people in the UK by English region and country, 2023

Source: Number of chain supermarkets across Local Authority Districts (LAD) and smaller geographical areas in the UK, ONS



In 2023 Scotland had the most supermarkets per person in the UK (by English region and country), with 3.39 supermarkets per 10,000 people, followed by 3.32 supermarkets in Northern Ireland (Figure 4.2.1b). London had the fewest supermarkets per 10,000 people at 2.20, followed by West Midlands with 2.35.

It is worth noting that there are likely to be fewer shops where there is much lower population density. For example, the high number of supermarkets recorded in Scotland may not be because of a large number of supermarkets per capita. Instead, it may reflect the existence of supermarkets which cover large catchment areas and serve a relatively small number of people. This can have implications for food prices, with research showing that remote rural areas in Scotland have higher food prices compared to the country's average (Revoredo-Giha and Russo, 2020).

Impact of COVID-19 pandemic

The COVID-19 lockdown had a significant impact on how households sourced their food. The National Diet and Nutrition Survey found that 68% of households physically went to grocery shops less often, while 34% did more grocery shopping online and 29% sought more local options for their shopping.

Access for disabled people

Disabled people are more likely than non-disabled people to have difficulty accessing food shops. Findings from the Government's Disability Unit's UK Disability Survey found that 40% of disabled people had experienced difficulties shopping around for products or services, with reported barriers including a lack of appropriate facilities (16%), difficulty using public transport (15%), and difficulty moving around premises (13%).

A survey carried out by the ONS in 2022 found that in Great Britain disabled people were more likely than non-disabled people to indicate difficulty accessing groceries, such as food or drink (25.0% for disabled people and 10.5% for non-disabled people). Disabled people who experienced difficulty accessing products or services were more likely than non-disabled people to report other barriers, including difficulty using transport (22.9% vs 6.1%), not having enough places to rest (15.3% vs 0.8%), difficulty using pavements (13.9% vs 0.9%), difficulty getting into or moving around buildings (12.5% vs 1.2%), difficulty accessing toilets (13.1% vs 2.2%) and other people's attitudes (9.0% vs 1.6%).

These findings are supported by research published by the charity Scope in 2021 which found that the most common physical barriers that disabled people reported in the UK while buying food in store were large numbers of other customers, items

being out of reach, and not knowing where items are due to changes in store layout.

The Food Foundation's Food Insecurity Tracker in 2023 found that of households in the UK with an adult limited a lot by disabilities, 23.2% had experienced food insecurity by not being able to get to food shops. In comparison, only 8% of households with no one affected by a disability could not get to food shops.

In June 2024, 32% of households in the UK with an adult limited a lot by disability experienced food insecurity, compared to only 10.1% of households with no disabilities. In July 2021 these figures were 24.1% and 5.2% respectively. However, the winter of 2022/23 saw a peak for both these groups with 45.4% of households with an adult limited a lot by disability experiencing food insecurity in September 2022, and 13.4% of households with no disabilities experiencing food insecurity in January 2023.

Access for older people

Food shops can also present physical challenges for older people. Research by Dickinson et al (2020) found structural factors, such as supermarket design, increased the likelihood of households aged 60 to 94 years becoming food insecure. The research also demonstrated how smaller everyday 'trivia', such as lack of seating and accessible toilets in supermarkets, accumulated to make people more vulnerable. Surveys of older people have also found that access to food outlets can be problematic. For example, a report by the UK Malnutrition Task Force in 2017 found that 11% of people aged over 65 stated they had difficulty accessing a corner shop, 12% found it difficult to get to their local supermarket and 28% of rural households noted they did not have a supermarket within 4 kilometres.

4.2.2 Online access to food shops

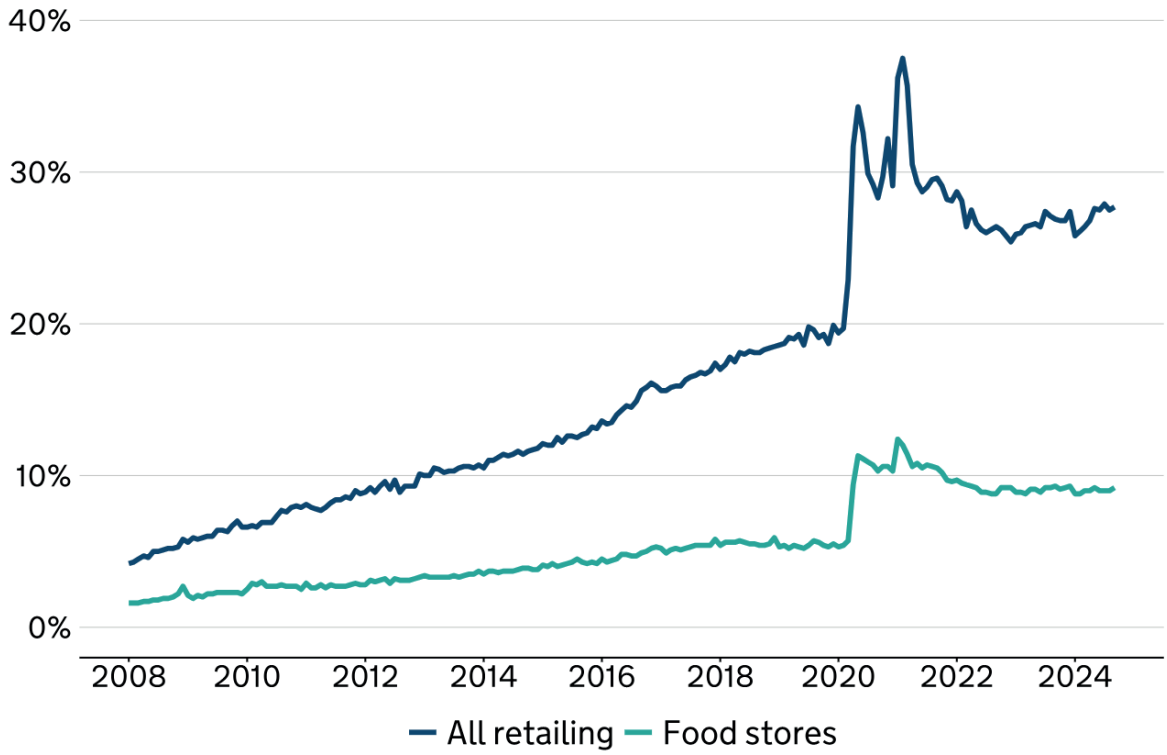
Rationale

Online access to food shops has become an increasingly important avenue for consumers to access food shops in a timely, convenient and economical manner. This indicator tracks internet sales as a proportion of food shopping and all other retailing over time to monitor the ability of UK consumers to digitally access food shops.

Headline evidence

Figure 4.2.2a: Internet sales, as a percent of all retail and food stores by value, in Great Britain, 2008 to 2024

Source: Retail Sales Index internet sales, ONS



Note: “Food stores" is mostly supermarkets but also includes specialist food stores such as butchers and bakers and off-licences. Supermarkets will have a proportion of non-food items such as clothing and appliances.

A proportion of food shopping is carried out online in Great Britain and has experienced consistent growth, although at a slower pace and from a lower starting point than all retail. During the pandemic, there was a rapid increase, with online food shopping peaking at 12.4% of all food shopping in January 2021. This was more than double the proportion of food shopping that was online in February 2020 when only 5.4% was online. Over the past three years, the proportion stabilised and slightly declined to 9.2% of food sales being online by September 2024. This reflects a gradual return to in-store shopping but also a lasting increase in online food shopping compared to pre-pandemic figures.

There was also a substantial spike in the proportion of online sales for all retailing, peaking at 37.5% in February 2021. Post-pandemic adjustments saw this proportion settle at 27.7% by September 2024. This is still markedly higher than pre-pandemic levels, indicating a continuing shift towards online shopping. Within this, the category of textile, clothing and footwear stores was the leading area of spend, having the highest proportion of online sales at 28% in September 2024.

Over the last 15 years, internet sales of food items from food stores in Great Britain have experienced a consistent growth pattern from January 2008 (1.6%) to September 2024 (9.2%). Some do not benefit from this improved digital access due to accessibility issues such as affordability and ability.

Supporting evidence

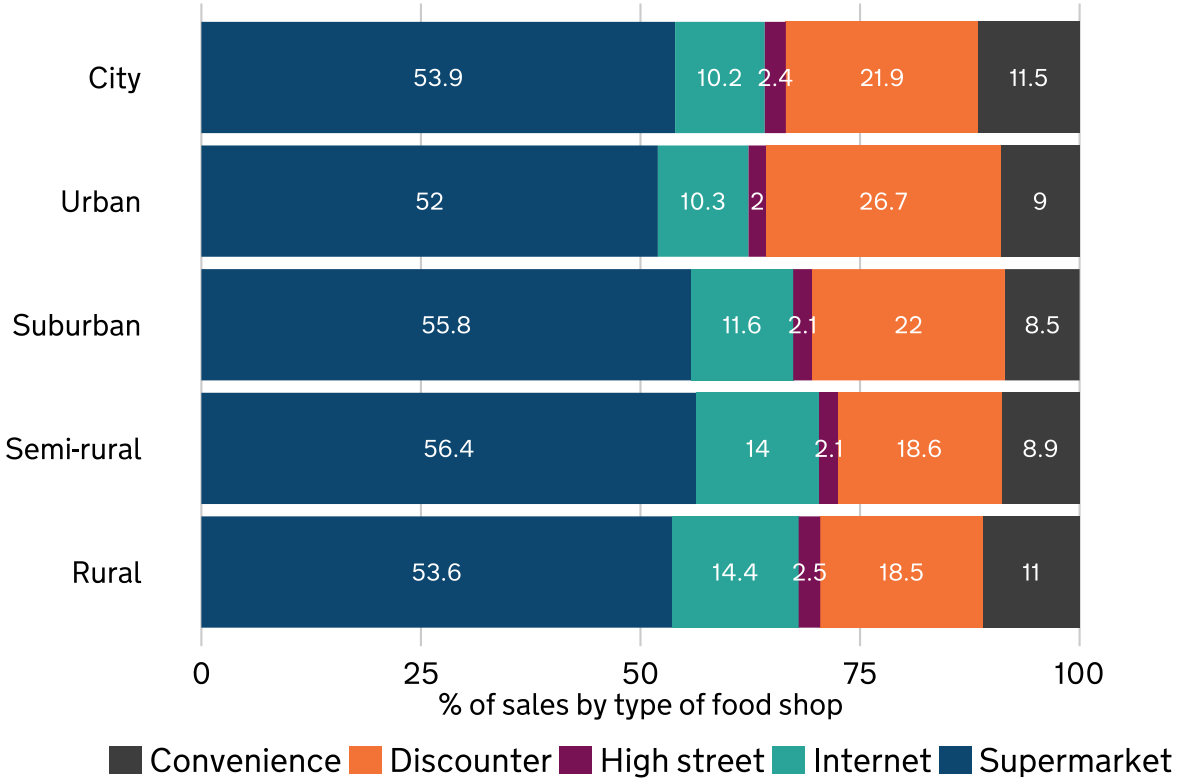
Online platforms

Online food shops are used less often compared to in-person food shops. Data from the FSA's Food and You 2 survey on where and how frequently consumers living in England, Wales and Northern Ireland buy food shows that large supermarkets are used most frequently with 75% of respondents shopping in a large supermarket at least once a week in mid-2023, however respondents also reported buying food from mini supermarkets (51%) and local/corner shops, newsagents or garage forecourts (24%) about once a week or more. Online supermarkets were used less frequently, with 13% of respondents ordering food from online supermarkets about once a week or more, while 4% of respondents reported having a recipe box delivered once a week or more.

Rural and urban areas

Figure 4.2.2b: Total spending both online and in-person by rural/urban, 12 weeks to 19 March 2023, Great Britain

Source: one-off analysis with data purchased from Kantar's Worldpanel



In all types of areas supermarkets are the most popular type of shop to buy food, in terms of sales (Figure 4.2.2b). This is followed in all area types by discount supermarkets (including Aldi and Lidl). Semi-rural areas have the highest percentage of sales at supermarkets at 56.4%, followed by suburban areas at 55.8%. Urban areas have the lowest percentage of sales at supermarkets. Internet sales are most popular in rural areas with 14.4% of sales, followed by semi-rural areas with 14.0% of food sales via the internet. City areas have the lowest percentage of internet sales at 10.2%.

Impact of the COVID-19 pandemic

Data from Kantar's Worldpanel shows that internet shopping took a larger share of food sales in 2020 due to the pandemic and peaked at a 14.6% share in the 12 weeks to 19 March 2021. This gradually dropped back and by the 12 weeks to 19 March 2023 its share was down to 11.4%

Greater access

Digital access to food shops offers benefits to some consumers by offering accessible web pages, assistance with carrying shopping and tracking spending. Research conducted by the Consumer Council on the food shopping experience for consumers in Northern Ireland found that participants thought websites for ordering groceries online were easy to navigate and that home delivery services also benefited consumers who needed assistance to bring heavier items into their home. For others, it saved time and helped with tracking spending via their online basket, with most feeling delivery charges were reasonable.

Digital exclusion

While Figure 4.2.2b shows that, proportionally, online food shopping is most popular in rural areas, Newing and others found in 2022 that the most remote and rural catchments tend to experience comparatively poor online groceries provision. This is visualised by the e-food desert index covering Great Britain. It highlights how remote and rural neighbourhoods are affected by the dual disadvantage of comparatively poor access to physical retail opportunities in addition to limited provision of online groceries.

This combination of digital exclusion and restricted access to physical shops is shared by other food insecure households (for example, households including disabled and elderly adults), who experience poor access to both physical and online food shops. While online access to food shops has become an increasingly important avenue for consumers, obstacles to using digital products for some people can restrict their ability to access food shopping online. The House of Commons debate on digital exclusion found that many private sector websites do not meet disabled people's communication needs, making them inaccessible and leading to digital exclusion. A survey carried out by Scope found that just under half (45%) of disabled people said they experienced accessibility issues with the supermarket's website or app when buying food online.

Other obstacles include affordability, with some people not being able to pay for access to the internet or internet-enabled devices, and ability, with some not having the required skills to navigate technology, the internet and websites. In 2021, 6% of UK households did not have access to the internet at home at all. Those most at risk of digital exclusion were older people, the financially insecure, and people impacted by a limiting condition like a hearing or vision impairment.

These issues of accessibility often overlap. Research carried out by the charity Scope for the period 2020 to 2021, during the COVID-19 pandemic, found that some disabled people experienced barriers to accessing online food deliveries.

This was due to issues relating to using apps, a lack of delivery slots, and the cost of delivery, including being unable to reach the minimum spend requirements, a particular problem for those living alone. This supports research carried out by the Trussell Trust which found that those with digital access issues were overrepresented at food banks (Hunger in the UK).

Forward look

A rise in the proportion of shopping carried out online has meant physical shops, high streets and shopping centres have adapted their offer to customers (House of Commons Library, 2024). Greater online retail is not correlated with the closure of physical shops. However, the strength of the high street is closely correlated to other local factors, such as levels of disposable income and the local labour market (Centre for Cities, 2023).

Sub-theme 3: Diet and Nutrition

4.3.1 Consumption patterns

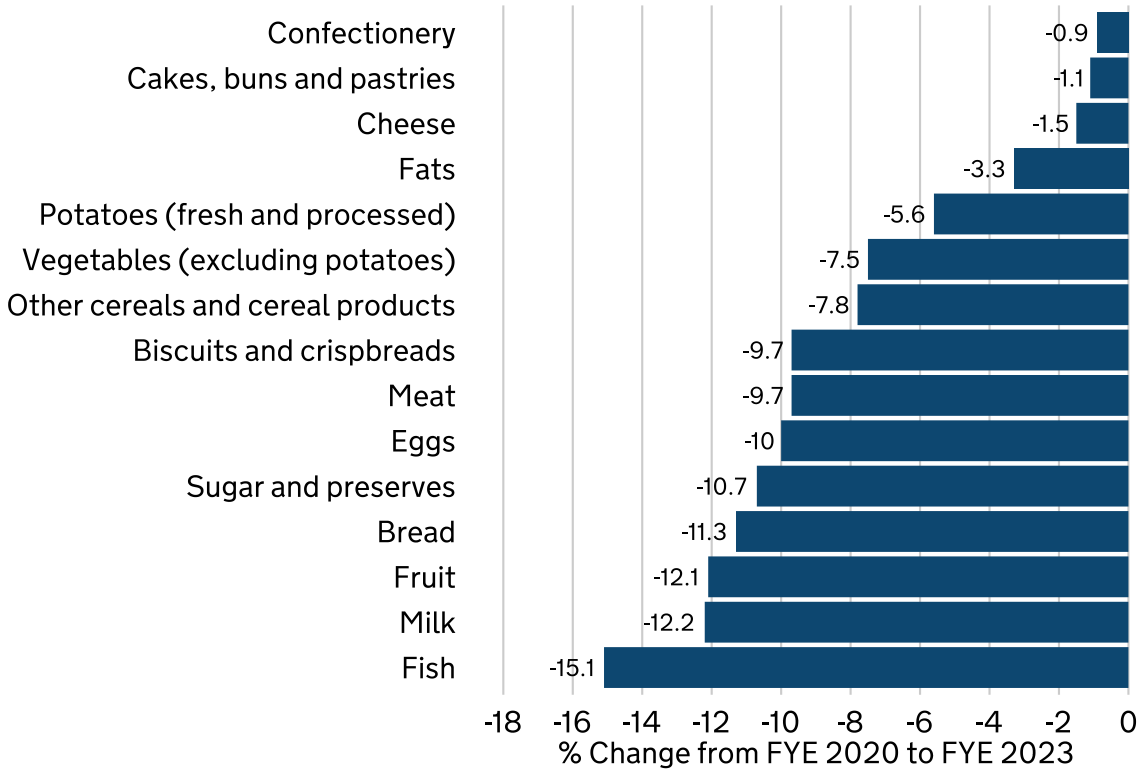
Rationale

Data from the Family Food Report shows how UK dietary patterns are changing through the amount and type of food purchased. It is one useful indicator of the utilisation dimension of UK food security by measuring changes to the nutritional value of UK food consumption. It also shows the degree to which UK food supply meets consumers' preferences and the norms and values that influence UK consumer demand for certain types of food.

Headline evidence

Figure 4.3.1a: Change in UK purchases, in volume, of different food groups eaten in the home, FYE 2020 to FYE 2023

Source: Family Food Report, Defra



Between FYE 2020 and FYE 2023 the purchases of all main food categories (in grams per person per week) decreased in the UK. Fish purchases decreased by 15.1%, milk by 12.2% and fruit by 12.1%. In the same time period, the volume of food eaten out (for example, at restaurants) by households also decreased, which could indicate that people were buying less food altogether. This data only covers purchases of food eaten in the home; for information on how much food is thrown away and not consumed, see Theme 2 Indicator 2.2.2 on Food waste.

Falls in purchasing of some food groups may contribute to continued poor diets in the UK, with the various health implications of not meeting recommended dietary intakes explored in Indicator 4.3.2 Healthy diet. Growing awareness of 'plant-based' diets and a fall in total meat consumption is also a longer-term trend which is a positive trajectory for sustainability and health, when accompanied by improvements elsewhere in the diet. This contrasts with rising global consumption (which is covered in further detail in Indicator 1.1.4 Global livestock products). Estimates in Defra's Family Food Report show that consumption of ready meals and convenience meat (such as burgers, sausages and cooked meats) has risen in the long term while consumption of less processed meat (for instance joints, steaks and chops) has decreased.

Supporting evidence

Plant-based diets

As there has been a growing interest in and awareness of 'plant-based' diets, Family Food Report data estimates that purchases of meat has decreased while that of non-dairy milk substitutes has increased. The term 'plant-based' encompasses a range of diets which aim to reduce the consumption of meat and other animal products, however there is no universally agreed definition of the term (Key, Papier and Tong, 2022). Data from Wave 7 of the Food and You 2 survey in 2023 suggests 4% of consumers across England, Wales and Northern Ireland are vegetarian (avoid meat and fish), 3% are pescatarian (avoid meat), 1% are vegan (avoid all animal derived products), and 10% are mainly vegetarian but occasionally eat meat. Data from Wave 4 of the Food and You 2 survey in 2022 suggests, of the respondents that reported having eaten less meat, poultry, or fish in the previous 12 months (28%), respondents were most likely to report eating less red meat (57%), processed meat (69%) and dairy or eggs (45%) for health reasons, with environmental/sustainability the second most common reason across all three food groups (55%, 36%, 32%, respectively). This has implications for levels of UK food demand as a move towards more plant-based diets could result in changes to demand in other food groups, such as livestock, with potential impacts on overall nutritional security. Further information on UK food demand and nutritional security is covered in Theme 2 and Theme 4 Indicator 4.3.2 Healthy diet respectively.

Impact of COVID-19 pandemic

The COVID-19 pandemic had some impact on the UK diet and affected people in different ways. Data from the National Diet and Nutrition Survey (NDNS) showed that there was no indication of a marked deterioration in diets between August and October 2020 at the overall population level compared with data collected before the pandemic. However, there was a wide range of individual differences. Almost one-fifth of households (19%) who participated in the study reported cutting down or skipping meals since the pandemic started. This was most often because of the non-availability of the food they wanted in the shops, with only 3% of participants citing lack of money as the reason for cutting down or skipping meals.

The Food Foundation also found that 16.2% of adults reported food insecurity in the first three weeks of the lockdown from March to April 2020, stating "a lack of food in shops alone explained about 40% of food insecurity experiences."

The FSA's COVID-19 consumer tracker, conducted across England, Wales and Northern Ireland each month between April 2020 and October 2021, asked participants whether they had cut down the size of their meals or skipped meals

because they could not afford to buy food. In October 2021, a higher proportion of respondents (21%) reported cutting meal sizes or skipping meals due to not having enough money than in April 2020 (18%), with the range of respondents reporting cutting meal sizes or skipping meals due to not having enough money ranging from 12% in August 2020 to 22% in May 2021.

NDNS data also found that households with children were more likely to report low financial and food security during the pandemic. Further information on how out of home spending patterns changed during the pandemic is covered in Indicator 4.1.2 Household spending on food.

Longer-term trends

While COVID-19 had a significant impact on the UK's food purchases in FYE 2021 (see Indicator 4.1.2 Household spending on food), with data from the Family Food Report indicating that the level of purchases for most food products have returned to longer-term trends. For example, while fruit, vegetable and meat purchases all increased from FYE 2020 to FYE 2021 by 7.3%, 11.2% and 2.8% respectively, they have since resumed their long-term decline. Household purchases of vegetables have been generally declining since 1978 when an average of 1,247g per person was purchased per week. This was interrupted by an increase in FYE 2021 to 1,275g, followed by a 15% decrease back to the long-term trend in FYE 2022 when 1,079g per person was purchased per week.

In a Progress Report for 2023 , the Food Foundation found that across the UK the proportion of vegetables by weight in an average shopping basket had fallen from 7.1% in 2018/19 to 6.8% in 2022/23. Similarly, a spike in fruit purchases in 2020/21 was followed by an 11.5% decrease back to the long-term trend in 2021/22.

Likewise, meat purchases peaked in 1980 and were relatively stable between 2013 and 2019/20. In 2020/21, there was an increase which was followed by a decrease of 12.5% in 2021/22. Data published in Defra's Family Food Report shows that UK consumers have reduced their combined household consumption of beef, pork and lamb by almost 62% from 1980 to 2022, while in the same period, household uncooked chicken purchases increased from 141g per person per week to 195g. Within this, consumption of less processed meat (such as joints, steaks and chops) has decreased.

Milk purchases per week (including non-dairy) have continued to decline, falling from 2,978ml in 1974 to 1,635ml in 2021/22, equivalent to a drop of 45.1%, with the latest yearly change showing an 8.7% decrease.

Conversely, consumption of ready meals and convenience meat has increased between 1974 and 2021/22. The health impacts of UK takeaway consumption can be found in in Indicator 4.3.2 Healthy diet.

Income

Purchasing data from Defra's Family Food report shows consumption patterns are highly correlated with the income of a household. The price point of goods can be an important factor in different consumption patterns. For example, price may be a barrier to fruit and vegetable consumption as these tend to be more expensive than other staple items and purchases tend to increase with higher incomes.

The proportion of household spend on premium items is correlated with household income. In the 12 weeks ending 19 March 2023, households with an income of less than £10,000 spent 19.9% of their spend on budget items (costing up to 57% of the category median) and 9.1% household spend on super premium items (costing 175% of the category median). This differs from households with an income of over £70,000, which spent 15% of their household spend on budget items and 14.1% of their household spend on super premium items.

Forward look

The longer-term effects of the COVID-19 pandemic, associated lockdowns and subsequent economic challenges on the UK's food security will be better illustrated in data from 2022 onwards. Future analysis must take particular care to note the impact of COVID-19 on food insecure and lower-income households.

Changes to consumer preferences affect the UK's balance of production and trade. A recent study shows the trend of consumer preference for plant-based food over animal-based foods is increasing the UK's dependence on international trade for its nutritional security. Over the last 50 years imports of fruits and vegetables have increased to become major sources of vitamin A and C in UK diets. For instance, plant imports are now the largest source of vitamin C, overtaking domestic crops. See further analysis of the UK's balance of production to supply of micronutrients in Theme 2 food sources Indicators.

4.3.2 Healthy diet

Rationale

This indicator tracks the dietary and nutritional intake of the UK population, comparing reported dietary intakes to UK dietary recommendations. It is therefore a useful indicator of the utilisation of UK food security by measuring the degree to which different population groups are meeting UK dietary recommendations and overall changes to the nutritional value of UK food consumption.

Government advice on a healthy, balanced diet is provided in the UK's national food model, the Eatwell Guide (EWG). EWG shows that a healthy diet is based on plenty of fruit and vegetables (at least 5 portions of a variety of fruit and vegetables every day) and starchy carbohydrates (particularly higher fibre or wholegrain). It also includes some protein foods (such as beans, pulses, fish, eggs or meat), dairy or dairy alternatives and 2 portions of fish a week, one of which should be oily. The guide shows that where foods and drinks high in saturated fat, salt or sugar (HFSS) are consumed that these should be eaten less often and in small amounts. It is also advised that people who consume large quantities of red meat and/or processed meat reduce their intakes to fewer than or equal to 70g per day.

This Indicator uses data from the Office for Health Improvement and Disparities' NDNS. The NDNS collects dietary information using a paper food diary dietary assessment with open text entry and estimated portion weights completed by the participant over 4 consecutive days. These diaries are reviewed by fieldworkers and foods and portions are coded centrally by trained coders into a dietary assessment system. The survey also assesses nutritional status using physical measurements and a blood and urine sample.

Headline evidence

Figure 4.3.2a: Nutritional intake of the general population compared with government recommendations, FYE 2017 to FYE 2019

Sources:

Urinary sodium for children and teenagers: NDNS: results from Years 1 to 4 (combined) - GOV.UK;

Urinary sodium for adults (aged 18 to 64): National Diet and Nutrition Survey: Assessment of salt intake from urinary sodium in adults (aged 19 to 64 years) in England, 2018 to 2019 - GOV.UK;

All other nutrients in the table: NDNS: results from years 9 to 11 (combined) – statistical summary - GOV.UK

Nutrient	Recommendation	Mean intake		
		Children 4 to 10 yrs	Teenagers 11 to 18 yrs	Adults 19 to 64 yrs
Total fat	≤35% energy excluding alcohol (ethanol)	34.2	34.2	35.2*
Saturated fat	≤10% energy excluding alcohol (ethanol)	13.1*	12.6*	12.8*
Trans fat	≤2% energy excluding alcohol (ethanol)	0.5	0.5	0.5
Total carbohydrate	≥50% energy excluding alcohol (ethanol)	51.0	50.0	46.8*
Free sugars	≤5% energy excluding alcohol (ethanol)	12.1*	12.3*	10.3*
Fibre (AOAC)	2 to 4 years ≥ 15g/d			
	5 to 10 years ≥ 20g/d	14.3*		

Nutrient	Recommendation	Mean intake		
		Children 4 to 10 yrs	Teenagers 11 to 18 yrs	Adults 19 to 64 yrs
	11 to 15 years ≥ 25g/d		16.0*	
	16+ years ≥ 30g/d			19.7*
Salt	4 to 6 years ≤ 3g/d	3.9*		
	7 to years ≤ 5g/d	5.3*		
	11+ years ≤ 6g/d		7.0*	8.4*
Fruit and vegetables	5 portions/d	-*	2.9*	4.3*
Red and processed meat	≤ 70g/day for adults	39	53	56
Oily fish	1 portion (140 grams) per week for adults	16*	18*	56*

Note: Figures followed by an asterisk indicate where intakes do not meet government recommendations.

Figure 4.3.2a shows nutritional intakes of the UK population according to the latest data from the NDNS. NDNS data from 2016/17 to 2018/19 (for all nutrients except urinary sodium in children which goes from 2008/09 to 2011/12) found that mean intakes of saturated fat, free sugars, and salt exceeded recommended maximums, while intakes of fibre, fruits, and vegetables and oily fish were below recommendations across all age groups. While people often worry about their protein intake, NDNS data indicates that the protein intakes of all population age and income groups are more than sufficient.

Average energy (calorie) intakes reported in NDNS are below average requirements due to underreporting of food consumption which is a universal issue in dietary surveys. However, modelling data based on calculated calorie consumption using height and weight data from the Health Survey for England, estimates that children who are living with overweight or obesity consume anywhere between 180 and 560 additional calories each day, depending on their age and sex. Adults who are living with overweight or obesity consume between

250 and 450 excess calories each day. Further exploration of dietary trends is provided under ‘supporting evidence.’

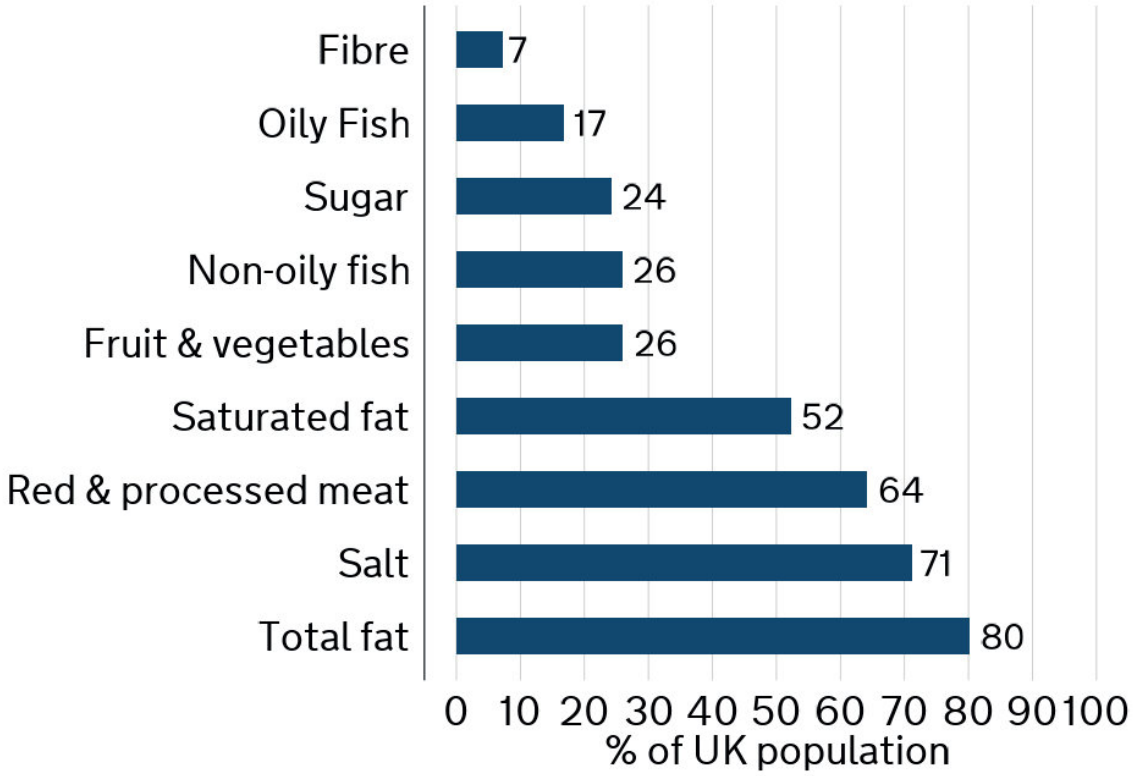
Supporting evidence shows that dietary intakes vary across population groups and that financial constraints strongly influence the ability to choose and consume healthier foods and drinks. Over the last 30 years, food and drink has become cheaper, more calorie dense, higher in saturated fat, salt and sugar (HFSS), more available and more heavily promoted, which is reflected in purchasing behaviours, food and nutrient intakes, and much higher levels of obesity. Healthy diets, in line with UK dietary recommendations, are associated with a reduced risk of some diseases and micronutrient deficiencies.

Supporting evidence

Dietary intakes of the population

Figure 4.3.2b: Adherence to specific Eatwell Guide recommendations by the UK population, using data from NDNS Waves 5-9 (FYE 2012 to FYE 2017)

Source: Health impacts and environmental footprints of diets that meet the Eatwell Guide recommendations: analyses of multiple UK studies, Scheelbeek and others, 2020

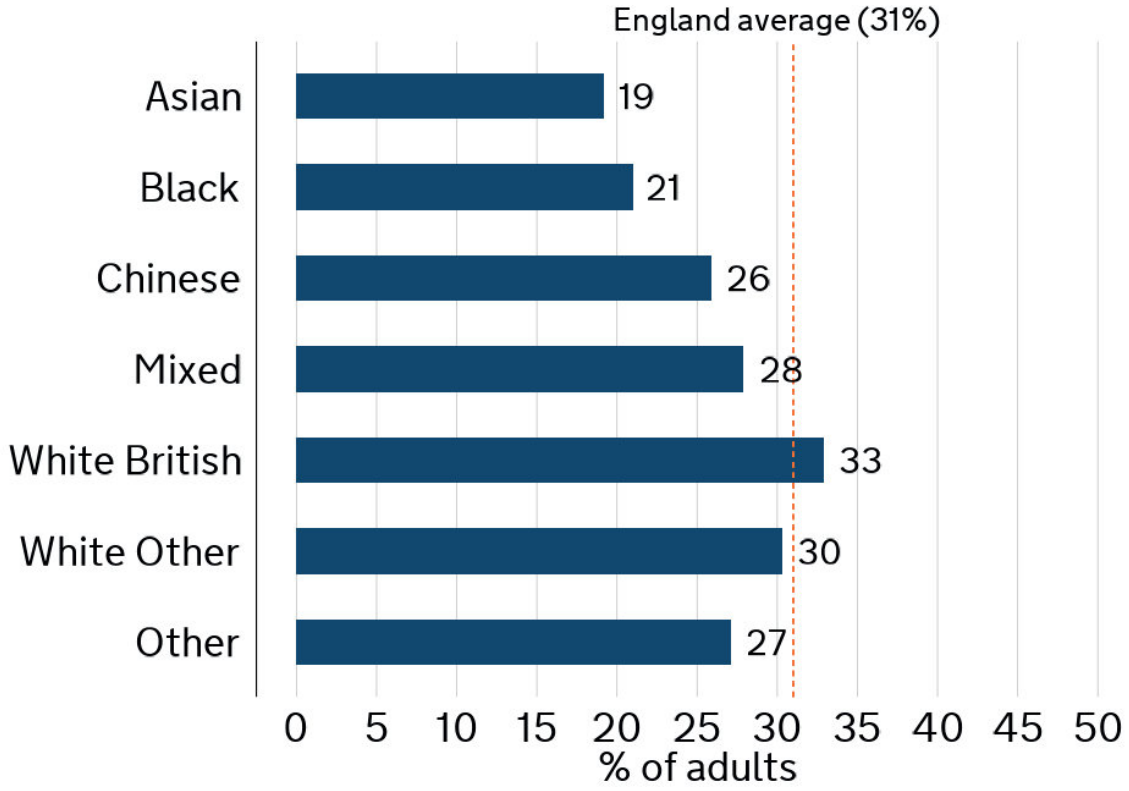


It is estimated that just under a third (30%) of the UK population meet at least 5 of the 9 EWG dietary recommendations, based on data from wave 5 to 9 of the NDNS. However, fewer than 1% meet all 9 of the recommendations (Figure 4.3.2b).

Data from the NDNS indicates that people in lower-income groups generally have a lower consumption of fruit, vegetables, oily fish, fibre and some vitamins and minerals than higher-income groups, and a higher consumption of sugar-sweetened beverages. While no income group fully meets dietary recommendations, analysis of NDNS data by equivalised household income shows that those on higher incomes were typically closer to meeting some of the dietary recommendations. The poorest 10% eat, on average, 42% less fruit and vegetables than recommended, while the richest eat 13% less. In practice, this means the bottom 20% of the population by income eat one fewer full portion of fruit and vegetables per day than the highest income 20%. On average, fruit and vegetable intake decreases as levels of deprivation increase.

Figure 4.3.2c: Percentage of adults in England aged 16 years and over eating '5 a day' by ethnicity, FYE 2023 only

Source: Fingertips | Department of Health and Social Care (phe.org.uk)



Dietary intakes are also likely to vary by ethnicity. Data from the Active Lives survey shows differences in consumption of fruit and vegetables by ethnicity (Figure 4.3.2c). To date, NDNS has not had a sufficient volume of participants to assess the data by ethnicity. However, this will be possible in future as the survey moves to a new online method.

The most recent NDNS data indicates that intake of some vitamins and minerals are below recommended levels in some population groups, as shown below.

Blood tests undertaken as part of the NDNS found low folate levels across most age groups, with dietary intake of folate falling since 2008. During pregnancy, folate needs to be increased, and 89% of women aged 16 to 49 have red blood cell folate levels below the threshold associated with an increased risk of foetal neural tube defects (NTDs), a group of congenital conditions affecting the brain, spine and/or spinal cord. NTDs include anencephaly, spina bifida, and encephalocele. The development and closure of the neural tube between the brain and spinal cord is normally completed within the 28 days following conception. NTDs are thought to be caused by failure of the neural tube to close. To reduce the risk of NTDs, women who may become pregnant are advised to take 400 micrograms of folic acid every day before pregnancy until the twelfth week of pregnancy.

An adequate level of vitamin D in the body is required for protection of musculoskeletal health. Vitamin D is either synthesised by the body when the skin is exposed to sunlight, which is the main source of vitamin D for most people, or it can be obtained from food or supplements. NDNS data shows that most age groups have low vitamin D levels, with dietary intake covering less than a third of the estimated requirements in adults and children. From late March or early April to the end of September, most people should be able to get all the vitamin D they need from sunlight on their skin. Since it is difficult for people to get enough vitamin D from food alone, all population groups are advised to take a daily supplement containing ten micrograms of vitamin D during the autumn and winter when sunlight exposure is minimal. Including supplementation, mean intakes are higher, however average intake does not meet the estimated requirements for any age group.

Iron, as a component of haemoglobin in red blood cells, is required for transporting oxygen around the body and, in the form of myoglobin, for the storage and use of oxygen in muscles. Mean iron intakes for girls aged 11 to 18 years and women aged 19 to 64 years were below requirements (56% and 76% of the requirements respectively) according to NDNS data. Women and girls have increased iron requirements compared to men and boys to account for losses which occur with menstruation. The NDNS blood tests found evidence of both iron-deficiency anaemia and low iron stores in 9% of girls aged 11 to 18, 5% of women aged 19 to 64 and 2% of women aged 65 and above.

Impact of the COVID-19 pandemic

The COVID-19 pandemic had some impact on the UK diet and affected individual people in different ways.

Data from the FSA from June and July 2020 shows that while some people became more health conscious during lockdown, many others responded by

increasing their reliance on snacking, quick foods, ultra-processed foods or takeaways as a result. These findings are supported by Public Health England's (PHE) analysis of grocery shopping behaviours during the first lockdown, which found an increase in the sales of snacks. Recent analysis from the Institute of Fiscal Studies indicates that takeaways and meal delivery grew by more than 50% during the COVID-19 pandemic and have stayed high since.

Data from an NDNS follow-up study similarly showed that there was a wide range of individual differences, although there was no indication of a marked deterioration in diets at the overall population level compared with data collected before the pandemic. While participants from households reporting lower financial or food security had poorer diets in some respects than participants from other households, by consuming less fruit and vegetables and fish and more sugar-sweetened soft drinks, there were no differences in reported consumption across other food groups. This includes confectionery, crisps and savoury snacks, with little difference in energy intakes between financial security categories. Further information on the impact of COVID-19 on consumption patterns is covered in Indicator 4.3.1 Consumption patterns.

Ultra-processed food

There is live and current debate about the topic of ultra-processed foods (UPF) and health. The Scientific Advisory Committee on Nutrition (SACN)'s position statement on processed foods and health concluded that observed associations between UPF and health are concerning, but it is unclear whether these foods are inherently unhealthy due to processing or due to their nutritional content. The statement noted that diets high in UPF are often energy dense, high in saturated fat, salt or free sugars, high in processed meat, and/or low in fruit, vegetables and fibre, which previous risk assessments had linked to poor health outcomes. Both the FSA and FSS have published advice on this topic, endorsing the SACN conclusion.

It is estimated that UPF contribute between 51% and 68% of total dietary calorie intake in the UK (with higher estimates for children and young adults). Intakes also appear to vary by socioeconomic status with UPF contributing a higher proportion of total energy intake for lower-income compared to higher-income groups.

Government dietary advice, based on recommendations from SACN, as depicted within the EWG, already shows that many foods that would be classified as UPF are not part of a healthy, balanced diet as they are high in calories and HFSS.

Food environment

According to the Department of Health and Social Care in 2024, as a proportion of income, food and drink in the UK has become cheaper, more calorie dense, higher in saturated fat, salt and sugar (HFSS), more available and more heavily promoted, marketed and advertised. This shift in the food environment is reflected in purchasing behaviours, food and nutrient intakes and much higher levels of overweight and obesity, as outlined below.

There is a broad body of research that suggests food consumed while eating out of home sector (OOH), including from takeaways, tends to be higher in calories, salt and sugar while also being low in fibre, fruit and vegetables, and portion sizes are larger (Huang and others, 2022; PHE, 2020). It has been estimated that the OOH sector in the UK provides up to 25% of average adult energy intake. Defra's Family Food Report estimated that in the FYE 2020 29% of household food and non-alcoholic beverages spend in the UK was in the OOH sector, but this proportion fell to 21% in the FYE 2023.

People in more deprived areas have greater access to fast-food outlets, as evidenced by research by PHE which found that the poorest areas in England have five times more fast-food outlets than the most affluent areas. Studies have also shown that access to online food delivery outlets further exacerbates the risks associated with fast food consumption, with the greatest access to online food outlets also being in the most deprived areas of England (Keeble and others, 2021; Keeble, Adams and Burgoine, 2023). Research from Bite Back indicates almost half (48%) of young people buy from meal delivery applications at least a few times a month.

According to the Food Foundation in 2023, one-third of advertising spend by the food industry in 2022 to 2023 was spent on marketing confectionery, snacks, desserts and soft drinks, while only approximately 1% of advertising budgets was spent on marketing fruits and vegetables. The spend and degree of advertising by the OOH sector is growing faster than other areas. A report by Bite Back showed that digital and social media advertising expenditure by the top ten biggest-spending fast-food outlets and delivery platforms increased by £37.5m between 2021 and 2022, an increase of 75%, rising from £50 million in 2021 to £87.5 million in 2022. The Department of Health and Social Care found in 2021 that advertising of unhealthy, high calorie food has been identified as a contributory factor to the increasing prevalence of obesity around the world. The School for Public Health Research found in 2021 that children and adults from lower socioeconomic groups are more likely to be exposed to advertising of HFSS foods.

Affordability of a healthy diet

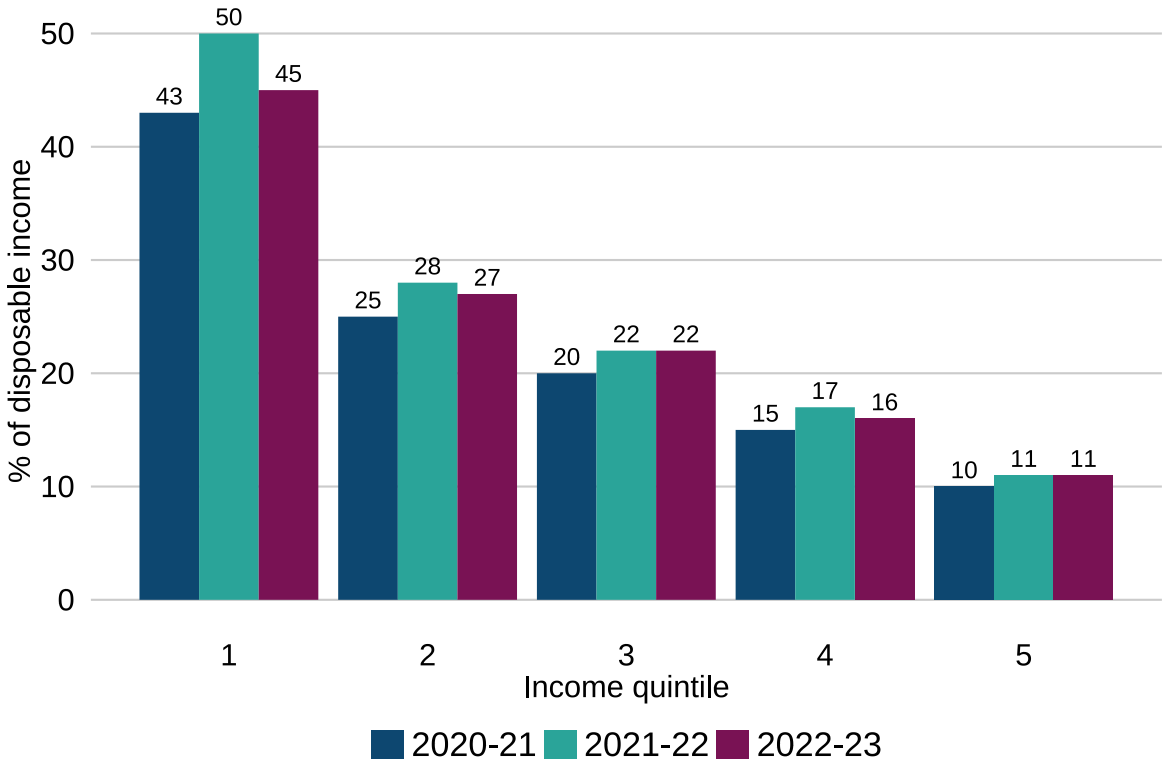
The affordability of a healthy balanced diet remains an issue for consumers. For example, 29% of respondents to Food Standards Scotland's (FSS) Food in Scotland Consumer Tracking Survey of 2024 stated they could not afford a healthy balanced diet.

Evidence suggests healthy diets cost more than less healthy diets. Research into individuals' dietary data by Eustachio and others (2021), which is contained in the NDNS (from FYE 2013 to FYE 2017), showed that meeting the '5-a-day' recommendation for fruit and vegetable consumption was associated with an increased diet cost of £0.34 to £0.46 per day.

Recent data shows that the cost of a healthy diet can vary widely depending on a range of factors. In 2022, the Food Standards Agency published a Northern Ireland-based research project using UK consumer price index indicating that food costs for the minimal essential food basket ranged from 23% to 45% of net income in Northern Ireland, varying according to household size, age of children and source of income. FSS undertook some exploratory research to provide an estimate of the cost of a healthy diet for a week using information from a single supermarket. This resulted in a wide range of estimates for the cost of a healthy basket: the cost of a basket of food needed to create a specific set of meals which meet dietary recommendations for a week for a couple cost £67.56 at its lowest price and £166.11 at its highest price, a difference of £98.55 (146%). Modelling work to cost a healthy basket for a family of 4 for a week was undertaken by PHE and completed by the Office for Health Improvement and Disparities in 2021/22, the findings of which broadly align with those of Scotland and Northern Ireland.

Figure 4.3.2d: Percentage of disposable income required to afford the diet recommended in the Eatwell Guide by income quintile in the UK, FYE 2021 to FYE 2023

Sources: Broken Plate 2023 Report, and Triple wins for children's poverty food insecurity and health, both published by the Food Foundation, 31 October 2024



Analysis by the Food Foundation reports that in FYE 2023 the lowest income fifth of households (quintile 1) would need to spend 45% of their disposable income on food to meet government dietary recommendations compared to 11% for higher income groups (Figure 4.3.2d). They also estimate that households with children in quintile 1 would have to spend 70% of their disposable income on food to meet the government dietary recommendation. This figure would be 12.4% for households in the highest income group (quintile 5) with children. Further information on how much households spend on food is covered in Indicator 4.1.2 Household spending on food.

Financial constraints significantly influence the ability to choose and consume healthier foods and drinks. In 2024, the Food Foundation, found that 1 in 7 (14%) of the lowest-priced fruit and vegetable products across 7 major retailers contained added salt or sugar, with low-income families facing several barriers in accessing and affording their '5-a-day'. Vegetable products were more likely than fruit products to contain added salt or sugar, and baked beans, tinned peas and tomato sauces were the most likely to contain added salt and sugar. A survey from the Food Foundation of 6,051 adults in January 2024 found that 60% of households

experiencing food insecurity reported buying less fruit (compared to 11% of food secure households) and 44% buying fewer vegetables (compared to 5.5% of food secure households). The rising cost of healthier foods can paradoxically result in obesity due to the reliance on inexpensive HFSS foods, which are more accessible to low-income individuals. The Food Foundation reported in 2023 that healthier foods in the UK are more than twice as expensive per calorie than unhealthy foods.

A retail food price modelling project for Defra in 2020 by Davidson and others shows that consumer food prices are principally determined over time by farmgate prices, import prices, exchange rates, labour costs and non-labour costs in food manufacturing. A more recent study was conducted by the same group for Defra, the results of which can be found here. Further information on the dynamic between the cost of imports and input prices is covered in Theme 3 Indicator 3.1.1.

Impacts of UK diet

Healthy diets in-line with UK dietary recommendations are associated with reduced risk of dental caries, obesity, chronic diseases (such as type 2 diabetes, heart disease and some cancers) and micronutrient deficiencies. Adherence to the EWG is associated with a 7% reduction in mortality, according to research by Scheelbeek and others in 2020. For example, eating less red and processed meat is likely to reduce risk of bowel (colo-rectal) cancer (SACN, 2010). UK adults aged 40 years old, with median dietary intakes, could gain approximately 1.3 years of life expectancy by sustaining a diet that meets EWG recommendations. In comparison, those with the highest risk diets may see life expectancy gains up to 8 years by changing to EWG dietary recommendations according to the findings of Fadnes and others in 2023.

Healthy diets have also been associated with some positive environmental impacts. Adherence to the EWG has been estimated by the Waste and Resources Action Programme (WRAP) to reduce dietary emissions by 13% on average. Modelling by FSS (2024) indicates that adhering to existing UK dietary recommendations on red and red processed meat contribute significantly to recommendations by the Climate Change Committee to reduce total meat intakes by 20% by 2030. If all adults living in Scotland met the existing recommendation of no more than 70g a day, it would achieve a 16% reduction in total meat intake. This is in a context where the majority of the population in Scotland do not have a diet similar to the EWG, and meat and dairy are therefore relatively more important in the diet as an important source of micronutrients. However, research by Galazoula and others in 2021, for example, suggests that a healthy diet is not necessarily sustainable. Further information on the environmental impacts associated with UK consumption is covered in Indicator 4.3.3 Sustainable diet.

Obesity is a concern among all population groups. Data from Health Survey for England, 2022, shows that the prevalence of overweight (including obesity) has remained stable in England since 2019, with 64% of adults estimated to be living with overweight or obesity, and 29% of adults estimated to be living with obesity in 2022. The daily supply of calories per person amounted to 3,362 kilocalories per day in 2021, equivalent to 34% more calories than the recommended level. However, this does not measure the amount of energy actually consumed, or account for consumer waste. This suggests a continuing trend of overconsumption of calories that, alongside overconsumption of HFSS foods, contributes to obesity.

Prevalence of overweight and obesity is highest among those living in the most deprived areas (71.5% and 35.9% respectively) and lowest in those living in the least deprived areas (59.6% and 20.5% respectively). This is supported by National Health Service (NHS) England data which showed that hospital admissions directly attributable to obesity were 4 times more likely in the most deprived areas compared to the least deprived areas. Data from the National Child Measurement Programme (NCMP) shows that obesity prevalence was twice as high for children aged 4 to 5 and 10 to 11 years living in the most deprived areas compared with those living in the least deprived areas.

Underweight is also a concern, though it is much less common than overweight or obesity. Data from the 2022/24 NCMP suggests that in England, approximately 1.2% of children aged 4 to 5 years and 1.7% of children aged 10 to 11 years have low weight for their height and age. The rate is higher in children from Asian ethnic groups, particularly children recorded as being of Indian ethnicity. Among children aged 4 to 5 years, those living in the most deprived areas were more likely to have a low weight for their height compared to those living in the least deprived areas, but this was not the case among those aged 10 to 11.

Data collected by NHS England on hospital admissions for malnutrition, covering both undernutrition and overnutrition, and nutrition-related deficiencies, such as rickets, show differing trends. Malnutrition figures show a gradually increasing trend, with figures in 2022/23 double that of 2007/08 (when records began). In the UK, the primary causes of malnutrition are clinical, meaning secondary to another health condition which may affect nutritional needs or impact on a person's ability to eat and drink. This is rather than it solely being caused by poor or inadequate dietary intake. The number of people with a primary or secondary diagnosis of rickets has varied but broadly remained stable since records began. It is not possible to establish from the admissions statistics what the underlying causes are. While data on scurvy is tracked and available by NHS England, cases stem from clinical or social causes, such as drug addiction, which impact on dietary behaviours, and so are not considered relevant to this report.

Research by Berkowitz and others in 2018, and by Estrella and others in 2021 in North America suggests that food insecurity is associated with poorer mental and physical health, higher healthcare utilisation and cost. Research conducted by the Resolution Foundation in 2023 found that 45% of adults who experienced severe food insecurity felt much more unhappy or depressed than usual.

Additional findings from qualitative social research on the impact of living with food insecurity on health are covered in the case study on the lived experience of food insecurity and its impact on health.

Forward look

While the relationship between nutrient intakes and food insecurity in the UK are currently unclear, international data indicates that food insecurity may be associated with poorer diets in adults and that adults with food insecurity are more likely to be living with overweight and obesity than food secure adults. Meanwhile, higher food insecurity in children has been found to be associated with a reduced likelihood of meeting nutritional intake recommendations for some micronutrients.

The FSA monitors food security and other consumer-related behaviours through its Food and You 2 survey, which is described in more detail in Indicator 4.1.1 Household food security status. Questions on food insecurity have been included in the NDNS since April 2022 although this data has not yet been published. Therefore, we do not yet know the long-term impact of recent increasing food prices and declines in food sales on population health and nutrition.

Case study 1: The lived experience of food insecurity and its impact on health

Introduction

Diet is an important health indicator (see Indicator 4.3.2 Healthy diet), being second and third in the 20 top risks in the hierarchy of factors contributing to death for females and males, respectively, according to the Global Burden of Disease, 2020. Barriers to healthy eating are complex, encompassing social, economic and infrastructural factors (Briazu and others, 2024). Increasing food prices presents a challenge for those on lower incomes who are more likely to cut back on purchasing healthy foods such as fruit, vegetables and fish (Johnstone and Lonnie, 2023). The struggles to make healthy food choices faced by some consumers, may have been exacerbated by the period of high inflation between 2021 and 2023. The reality of living with food insecurity may not be fully reflected in large-scale survey data (Lonnie and others, 2024). Integrating qualitative social research into our understanding of food insecurity within the context of the UK

food system, including in relation to people's lived experiences, is important. Such research provides insights into our understanding of dietary and health inequality gaps, which are expected to widen if no actions are taken due to current economic pressures, climate change impacts and import dependency in the UK and globally (UK Health Security Agency, 2023 ; Power and others, 2021).

Description and Analysis

The lived experience of food insecurity and its impact on diet: Quantitative data captured by this theme of the UKFSR shows the scale and magnitude of food insecurity in the UK. However, it is important to understand the lived experience of people living with food insecurity. Qualitative data can often provide richer insights into struggles, uncover nuances and drivers of behaviours which can be used to interpret the results of national surveys, as well as identify gaps in knowledge missed in quantitative research (Hunt, Pettinger and Wagstaff, 2023).

This case study considers qualitative data collected in 2 research projects funded by the Transforming UK Food Systems - Strategic Priorities Fund (TUKFS-SPF) Programme. The Programme aims to fundamentally transform the UK food system by placing healthy people and a healthy natural environment at its centre. The Food Insecurity in people living with Obesity (FIO Food) project offers insights into the lived experience of consumers living with food insecurity and obesity considering the context of the retail environment, while the Food Systems Equality (FoodSEqual)-Health project shares knowledge and learning from working with disadvantaged communities to improve access to, and the affordability of, fresh produce alongside community-based health and social care support.

Project one: the FIO Food project: The FIO Food project aims to combine knowledge from large-scale population data with an understanding of the lived experience of food insecurity and obesity, to support environmentally sustainable and healthier food choices in the retail environment. A key feature of the project is that it is co-produced with those who have lived experience and uses a transdisciplinary approach, involving collaboration with experts in nutrition, public health, psychology, health geography and data analytics, as well as stakeholders from policy and retail sectors (Lonnie and others, 2023).

Qualitative data from this project uncovers the influences surrounding purchasing decisions of people living with obesity and food insecurity, and ways in which they attempted to navigate the rising cost of food during the period of high inflation between 2021 and 2023.

Figure 4.3.2e: Pen portraits of diet inequalities

Source: Outputs from the FIO Food project lived experience workshop in Aberdeen

Name of shopper	Type of shopper	Experience
Shirley	The secret shopper	I have a car, a house and live in a nice area, but I was made redundant during the COVID pandemic. I feel ashamed that I need to use the local community food larder as I don't have enough money to buy the weekly shopping. I live in an area that is perceived to be nice, but I am in trap of poverty.
Olivia	The rural shopper	There isn't many shops near me, I live in a remote area. It's not heat or eat, I can't afford either. Prices of food are higher at the local corner shop. I'd like to get a veg box, but I don't know what to do with all the produce and it ends up in the bin.
Sam	The scoop shopper	I go shopping with a list, but it is too expensive to buy all my food at a supermarket. I use a local 'scoop shop,' to buy dried foods by weight, such as pasta and lentils – it is cheaper to buy smaller amounts, I only get what I need.
Robert	The reduced counter shopper	I shop at 7-8pm at a local supermarket which is the time that the food is reduced. It's called 'feeding time at the zoo' locally, when all the food is reduced I wait for meat to be reduced in price, then do the rest of my shopping. I don't have time to think about all this eco-friendly nonsense.
Mandy	Make ends meet shopper	It was hard to admit that I needed help to feed the family. I use the local food bank and larder to get food. I have noticed that the quality and quantity of food there has decreased recently. It has helped to get help with budgeting for food shopping and to use shopping list to plan what to cook.

Name of shopper	Type of shopper	Experience
Fred	The pensioner shopper	I don't have a fancy computer to do online shopping. I can't carry heavy shopping bags from the supermarket, so I prefer to do a single shop each day. It's cheaper for me to eat cold food, as I don't have to pay for cooking.

Note: Lived experience of the challenges that people living with food insecurity face when shopping for healthy and sustainable foods to support their health and healthy weight. Outputs from the Public Involvement workshop during the Challenge Poverty Week in October 2022 – quotes from participants. Co-organised with Aberdeenshire Council. Names have been changed to protect anonymity.

Figure 4.3.2e illustrates qualitative data gathered during one of the project workshops during Challenge Poverty Week in 2022. Over 30 Aberdeenshire consumers who face challenges of food insecurity and obesity discussed barriers in purchasing foods that would help to maintain a healthy diet. These findings highlight the struggles associated with the stigma of food insecurity while shopping, and limited access to healthy produce. This is multidimensional for some people, where limitations include insufficient budget, geographical challenges (for example, living in rural areas and 'food deserts'), and/or lack of the digital skills that allow online shopping. As a result, shoppers with food insecurity buy what they can afford rather than what they would wish to buy to support their health.

Project two: FoodSEqual: FoodSEqual, and its daughter project FoodSEqual-Health, are interdisciplinary projects that are committed to transforming food systems with disadvantaged communities by using the community food researcher model. FoodSEqual-Health is running an intervention called Fresh Street Community, which provides non-means-tested vouchers for purchasing fruit and vegetables at a bespoke stall set up as a social enterprise at local hubs. The intervention tackles both access to, and affordability of, fresh produce in two locations (Whitley, Reading and Whitleigh, Plymouth), and explores the benefits of social connectivity with access to wellbeing and healthcare, which are provided alongside the fruit and vegetable stalls.

Engagement with participants at the Reading site (Whitley Community Development Association – WCDA) in November 2023, prior to the start of the intervention, showed that a large proportion of households experiencing food insecurity consumed very few portions of fruit or vegetables. For example, 48% of households consumed no portions of fruit or vegetables the preceding day, and

thematic analysis of one-to-one structured interviews illustrated the struggles people face with maintaining healthier eating habits:

- *'I don't eat vegetables – but I am encouraged to because this is at WCDA'*
- *'I don't have any strong memories of family meals – none of school dinners as I was always packed lunch. The family favourite meals didn't include vegetables – except mashed potato. I don't change what I eat depending on season'*
- *'I struggle to get enough fruit and veg in me – it comes down to cost and time. I am struggling with my mental health – and it makes me not want to cook – or cook things that I have to watch. I am trying to make it healthier but struggling. I eat salad as no preparation is needed. It's about time management – I do try and keep up with seasonal fruit and vegetables, but it depends on price. I want to get to a point where price comes after my nutrition needs. I do all the cooking on my own.'*
- *'I have problems with depression and anxiety, eating fruit and vegetables I noticed I felt better after 5-weeks'*

Discussions with participants at the same site after the intervention in June 2024 revealed the dependency that some households have on both the stall and the vouchers:

- *'So grateful for the vouchers as been struggling for a while.'*
- *'What you doing is great we couldn't manage without you - money is tight.'*
- *'I've not eaten for 3 days - money not come in yet.'*

The relationship between food insecurity and poor health: Unhealthy dietary patterns, coupled with the psychological stress of food insecurity, can lead to increased caloric intake, subsequent weight gain and obesity comorbidities, as well as a profound effect on mental health (Eskandari and others, 2022; IHME, 2022; Rindler, 2023). Low-income households may employ coping strategies such as shopping at multiple stores to find the best prices, bulk buying, coupons, and batch cooking to mitigate food insecurity (Stone and others, 2024). However, exploratory analyses showed some of these practices, such as budgeting, may lead to poorer diet quality. Efforts to purchase healthy, nutritious food are challenging and less consistent despite a preference for healthier options (Stone and others, 2023; Hunter and others, 2024).

Conclusion

Research findings based on people's lived experience highlight the struggles associated with maintaining healthier eating habits and support the wider evidence base on the connection between food insecurity and diet and health inequalities. Qualitative research can shed light on the mental and emotional challenges experienced by disadvantaged communities and individuals as they struggle to provide food for themselves and their families, especially due to financial restrictions and stigma (Hunter and others, 2024).

4.3.3 Sustainable diet

Rationale

While there is no universal definition of what constitutes a 'sustainable diet,' they are broadly considered to be 'diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations' (Food and Agriculture Organization of the United Nations (FAO), 2010). They combine environmental, health and socio-economic dimensions, such that they are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, affordable, and nutritionally adequate, safe and healthy.

Some components of a sustainable diet are covered in other themes and indicators of the UKFSR. The health aspect is covered in Indicator 4.3.2 Healthy diet; the socio-economic aspect is covered throughout Theme 4, in particular in Indicator 4.1.2 Household spending on food, Indicator 4.1.3 Price changes of main food groups, Indicator 4.2.1 Physical access to food shops and Indicator 4.2.2 Digital access to food shops; while some environmental indicators include the use of antibiotics in UK food production in Theme 2 Indicator 2.2.1, levels of food loss and waste in Theme 2 Indicator 2.2.2, and UK consumption of plastics in Theme 3 Indicator 3.1.2.

This indicator, 'sustainable diet,' builds on data covered in other themes of the report to assess the degree to which UK diets have a low impact on the environment and contribute to food security by supporting the preservation of biodiversity and planetary health. This is measured through trends in GHG emissions, water, land use and biodiversity based on how guiding principles on 'sustainable healthy diets' developed by the FAO and World Health Organisation (WHO) characterise environmentally sustainable diets. They provide one measure of the sustainability of the UK food system and are a key feature of household food security.

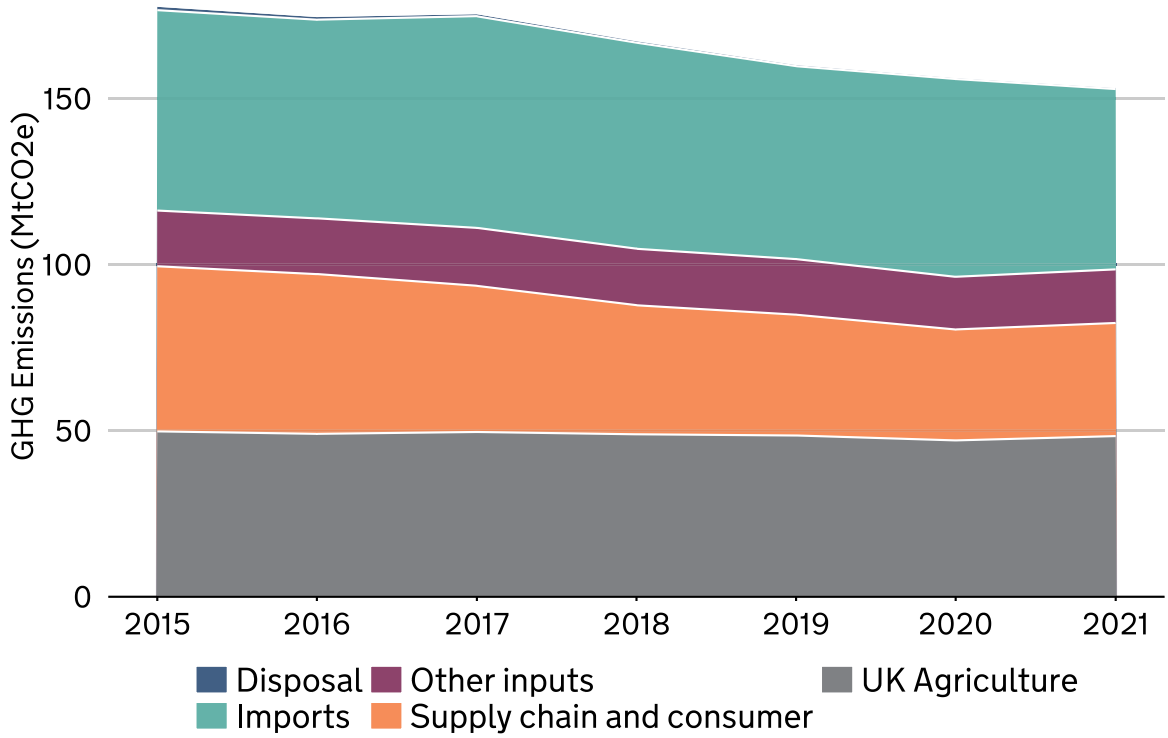
Headline evidence takes data from WRAP and shows estimates of the total GHG emissions associated with food and drink consumption in the UK (across all stages of the value chain) which contribute to one aspect of planetary health. Supporting

data shows the impacts of UK consumption on deforestation, water scarcity and biodiversity loss.

Headline evidence

Figure 4.3.3a: Total UK Food System Emissions Estimates for 2015 to 2021 by supply chain stage

Source: [UK Food Systems GHG Emissions Model 2015-2021 (wrap.ngo)]



Between 2019 to 2021, UK GHG food-related emissions have broadly remained stable or shown some notable decreases depending on the supply chain stage. There was a notable decrease in emissions from imports which fell by 3.8 million tonnes of carbon dioxide equivalent (Mt CO2e) between 2019 and 2021 from 58.10 Mt CO2e in 2019 to 54.32 Mt CO2e in 2021. This was likely a result of a decrease in imports during this period. As explored in Theme 2 the percent of food consumed in the UK that was grown domestically increased from 53% in 2019 to 58% in 2021, as a fall in imports from the EU was largely replaced by an increase in consumption of UK-produced food. A decrease in imports over this period was likely to be a result of COVID-19 and the UK leaving the EU Customs Union. Since 2021 imports from the EU have increased but remain lower than levels prior to the UK's exit of the EU.

Similarly, the supply chain and consumer sector saw a downward trend over the same period, decreasing by 3 Mt CO2e from 36 Mt CO2e in 2019 to 33 Mt CO2e in 2020, with a small rise to 34 Mt CO2e in 2021.

The COVID-19 pandemic and associated lockdowns are likely to have influenced levels of emissions in some food system sectors. Substantial decreases of approximately 12% in emissions between calendar years 2019 and 2020 were recorded in the hospitality and food service sector, supply chain transport and consumer transport sectors, according to a report by WRAP in 2024. These are likely to have been driven by business closures and reduced frequency of shopping over this period. Given some public health restrictions were still in force in 2021, data from 2022 may show a rebound in the data for some sectors.

Supporting evidence shows a more nuanced picture across other measures tracking the impacts associated with UK food consumption. The measures show a fluctuating trend in predicted regional species loss, a slight upward trend in deforestation and larger increase in water scarcity impacts.

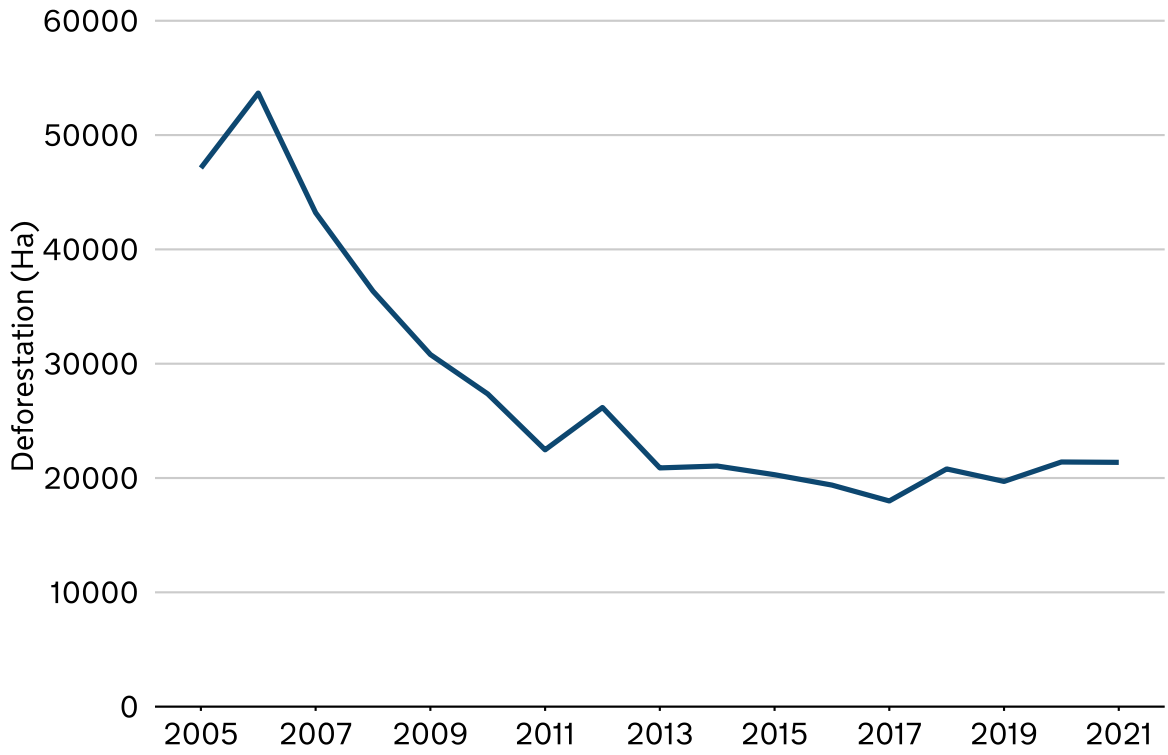
Supporting evidence

Food products are associated with different environmental impacts. In 2022, Clark and others completed the most comprehensive analysis of the environmental impacts of food products to date, estimating the environmental impacts of 57,000 food products across four indicators: greenhouse gas emissions, land use, water stress, and eutrophication potential. Their report shows that food types range from having low, to medium, to high environmental impacts. Examples of low environmental impact foods include sugary beverages, fruits and breads. Intermediate impact foods include many desserts and pastries. While high impact foods include meat, fish and cheese. The largest source of environmental impacts, including carbon emissions, from food occurs during the production phase (on average ~70%, but rising to as high as 95% in some cases). Research by Poore and Nemecek in 2018 found that other areas have a relatively small impact, for example packaging, transport and retail for high impact products can contribute to less than 1% of GHG emissions. The food health profiling method used by Clark and others revealed that healthier products are often more environmentally sustainable, but there are exceptions to this trend. Foods that consumers may think are substitutable can have markedly different impacts, for example, replacing meat, dairy, and eggs with plant-based alternatives could have large environmental and health benefits in places where consumption of these foods is high. Meat purchases have declined since the 1980s in the UK (see Indicator 4.3.1 Consumption patterns), suggesting a trend in less environmentally impactful diets. Further information on the impacts of a healthy diet is covered in Indicator 4.3.2 Healthy diet.

Deforestation

Figure 4.3.3b: Area of deforestation associated with UK consumption of food commodities annually in hectares (Ha), 2005 to 2021

Source: Adapted from the 2023 data release of UKBI - A4. Global biodiversity impact | JNCC - Adviser to Government on Nature Conservation (non-food commodities removed)

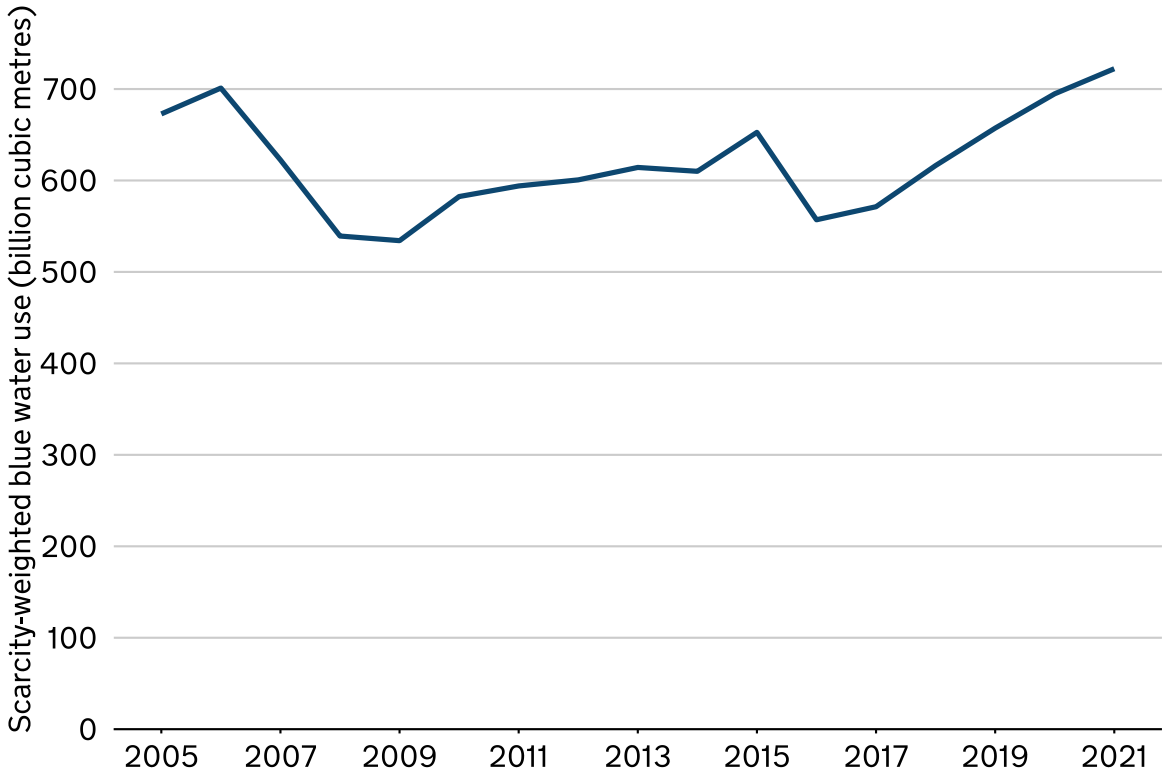


In the last three years of recorded data, from 2019 to 2021, the area of deforestation worldwide estimated to be associated with UK consumption of food commodities has shown a slight upward trend (Figure 4.3.3b). In 2019, the deforested area was 19,702 hectares, which increased to 21,402 hectares in 2020, and remained relatively stable at 21,371 hectares in 2021. Historically, from 2005 to 2018, there was a general decline in deforestation, with the area decreasing from 47,122 hectares in 2005 to 20,794 hectares in 2018. This earlier trend highlights a reduction in deforestation over the period, followed by an uptick in recent years. Deforestation associated with UK consumption has been primarily driven by cattle-related products, followed by soy, palm oil, cassava, and maize. Further information on the impact of deforestation on global food supply is covered in Indicator 1.2.2. Global land use change and Indicator 1.5.1 Global land degradation.

Water scarcity

Figure 4.3.3c: Scarcity-weighted blue water use associated with UK consumption of food commodities annually, 2005 to 2021

Source: Adapted from the 2023 data release of UKBI - A4. Global biodiversity impact | JNCC - Adviser to Government on Nature Conservation (non-food commodities removed)

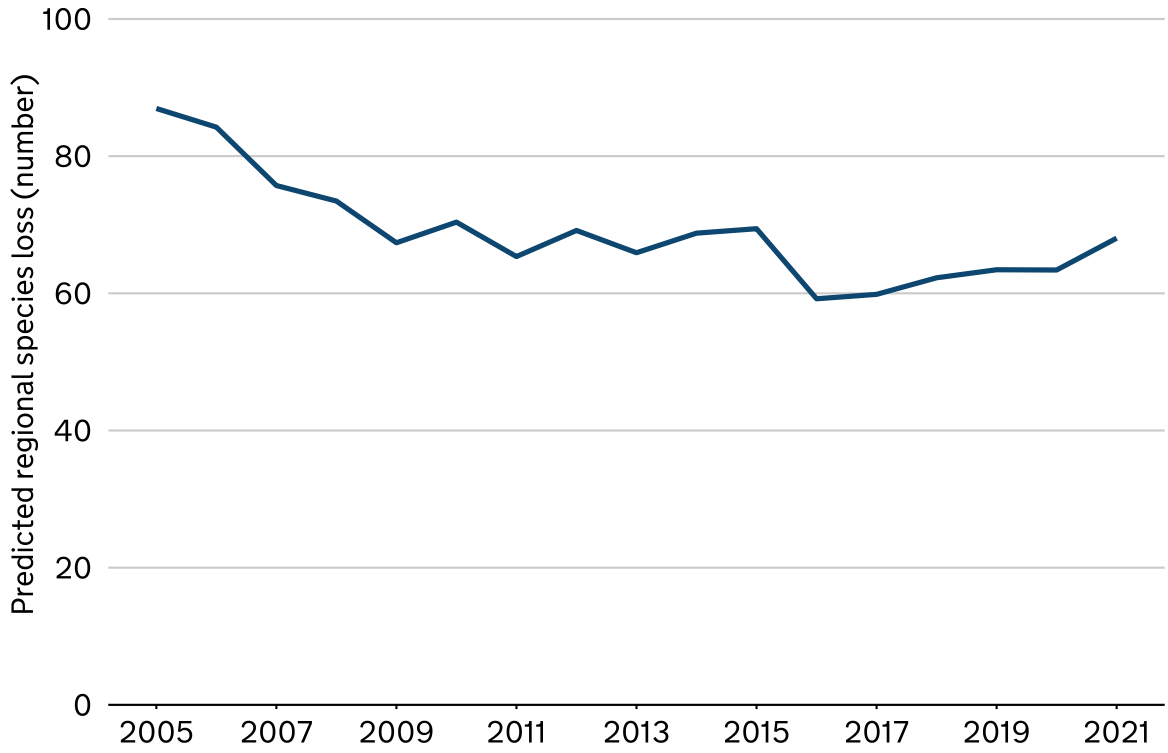


Similarly, scarcity-weighted blue water use worldwide, which scales the blue water footprint (surface and groundwater consumed as a result of production) according to water availability in a region after human and aquatic ecosystem demands have been met, has increased between 2019 and 2021. Scarcity-weighted blue water use estimated to be associated with UK consumption of food commodities has increased consistently from 2019 to 2021, from 657 billion cubic meters in 2019 to 722 billion cubic meters in 2021 (Figure 4.3.3c). From 2005 to 2018 the trend displayed greater variance. The recent upward trend has been primarily driven by wheat, followed by rice, maize, sugar cane, and olives. Further information on the impact of water scarcity on food supply is covered in Indicator 1.2.4 Water availability, usage and quality for global agriculture and Indicator 2.2.7 Water quality.

Biodiversity loss

Figure 4.3.3d: Predicted regional species loss associated with UK consumption of food commodities annually, 2005 to 2021

Source: Adapted from UKBI - A4. Global biodiversity impact | JNCC - Adviser to Government on Nature Conservation (non-food commodities removed)



The predicted regional species loss within the UK estimated to be associated with UK consumption of food commodities has increased slightly over the last three years from 2019 to 2021 (Figure 4.3.3d). In 2019, there was a loss of 63 species, which remained unchanged in 2020, but increased to 68 species in 2021. Over the longer term, from 2005 to 2018, there was a general decrease in the rate of species lost from 87 species lost in 2005 to 62 species lost in 2018, reflecting a downward trend with some variability. The data indicates that while there was a consistent reduction in species loss over the last 20 years, while recent years show a reversal of that trend with an increase in species loss. This has been primarily driven by wheat, followed by rice, maize, oil palm fruit and barley. Further information on the impact of biodiversity loss on food supply is covered in Indicator 2.2.5 Biodiversity.

Methodology

The data source on the impact of UK consumption on deforestation, biodiversity loss and water scarcity is an adapted version of the 2023 data release of UKBI - A4. Global biodiversity impact | JNCC - Adviser to Government on Nature Conservation (non-food commodities removed). It covers all agricultural crop commodities as described by the FAO in addition to cattle and excludes other foods, such as seafood and meat beyond cattle. The dataset combines environmental datasets and trade modelling to proportionally attribute impacts associated with UK consumption. It is, therefore, sensitive to overall levels of consumption (as higher consumption is associated with higher impacts), the sustainability of production practices associated with our consumption (as increasing the efficiency of production methods would be reflected in the underlying environmental datasets), and sourcing patterns (as changes in sourcing patterns would lead to differences in the impacts associated with production of that commodity between countries). Further information on the profitability of farming is covered in Theme 3 Indicator 3.3.3.

Attitudes towards sustainable diets

People are not fully aware of what contributes towards a sustainable diet and how to make sustainable food shopping choices. Results of an FSA poll on consumer views of healthy and sustainable diets in 2021 showed that 48% of respondents believed they knew what a sustainable diet consisted of, and 51% understood the impact their diet had on the environment. In comparison, 75% of respondents believed they knew what a healthy diet consists of and 78% understood the impact their diet had on their health. Similarly, a more recent interview study by Whittall and others in 2023 on public understanding of sustainable diets showed that while participants understood what was meant by sustainable eating and could identify sustainable actions, there was noticeable uncertainty, and competing definitions of sustainability and sustainable actions were also given.

While studies such as that of d'Angelo and others from 2020 suggest there is increasing awareness of the negative environmental impacts of food production systems, and results from a Defra-commissioned study published in 2022 record high environmental concern amongst consumers, consumers have low awareness and knowledge around the impact of food on environmental outcomes according to the same Defra study. In 2021/22, the FSA's Food and You 2 survey asked respondents in England, Wales and Northern Ireland to choose from a list of actions which they thought were most likely to contribute to making sustainable choices. Respondents thought that eating less processed food (50%) and minimising food waste (47%) contributed most to having a sustainable diet, and 59% thought that buying locally-produced, or in-season food contributed most to

making sustainable food shopping choices. While these actions may contribute to a sustainable diet, consumers failed to appreciate the larger role other factors play in making sustainable choices, such as reducing meat or dairy consumption.

Different factors influence whether people act on their awareness to make more sustainable consumption choices. A Defra project, to develop insights into strategic issues, looked at sustainable and healthy food choices in 2023, to understand the drivers and barriers to those choices, and initiatives that may encourage uptake. The research suggested that the primary drivers for sustainable food choices were reduced environmental impact, reduced waste and food quality, with the perceived cost of healthy and sustainable food choices being the primary barrier to adopting those choices. A randomised control trial published by the FSA in 2023 found that listing products in order of sustainability in a simulated online supermarket did not have an effect on the proportion of sustainable choices made, either when the ordering was covert or when it was accompanied by a statement informing participants about the ordering. This suggests that purchasing choices are not influenced by subtle changes to the shopping environment and are largely driven by preferences for certain grocery products.

Affordability remains an important barrier to people making more sustainable food choice. In addition, stronger motivations are needed to change levels of meat and dairy consumption. Research on the psychologies of food choice published by the FSA in 2022 found in general that very strong motivations are needed to change eating habits for meat and dairy due to the barriers in terms of capability and opportunity.

Theme 5: Food Safety and Consumer Confidence

Theme definition

In a secure food system, consumers should have access to sufficient quantities of safe and nutritious food. They should also have confidence that food safety is underpinned by an effective regulatory framework, and that the food they eat is accurately labelled. Safe food reduces risks to public health, the economic and social burden of foodborne disease, and contributes to economic growth.

This theme examines trends in consumer confidence (Sub-theme 1), food safety incident alerts, foodborne disease outbreaks, food crime (Sub-theme 2), and food business compliance with hygiene regulations (Sub-theme 3). This edition of the report includes 2 additional indicators to reflect other important dimensions of food safety and consumer confidence. These cover surveillance sampling (5.2.1), and safety of non-EU imports (5.3.2).

While the metrics in this theme are not direct measures of food security, they provide some insight into the safety of the UK food chain, consumer confidence and public trust in the UK food system. These insights help regulators, enforcement authorities and wider government to understand the agency of the consumer, and their ability to access and utilise food, which are important factors to consider in the UKFSR's assessment of food security.

Overall findings

- **The results of UK consumer surveys indicate that the levels of trust in the Food Standards Agency (FSA) and Food Standards Scotland (FSS) have remained relatively high.**

  Key statistic: Consumers' trust in FSA and FSS to ensure that food is safe to eat remains high (>80%).

- **The number of people reporting concerns about food prices has risen since 2021.**

  Key statistic: In 2023, food prices became the top food-related prompted concern among UK consumers. 93% of respondents surveyed in Scotland were concerned about the cost of food and 72% in England, Wales and Northern Ireland. Due to differences in data collection, survey results from England, Wales and Northern Ireland cannot be compared with those from Scotland.

- **Approximately a quarter of all incidents reported over the last 3 years involved the identification of microorganisms**.

  Key statistic: Approximately 26% of all incidents reported over the last 3 years related to the identification of microorganisms that have the potential to cause illness (such as Shiga toxin-producing *E.coli , Listeria* and *Salmonella*); and required action to be taken by authorities and food businesses to protect consumers.

- **There have generally remained relatively stable trends in laboratory-confirmed reports of pathogens that can cause foodborne gastrointestinal disease** and the proportional trends in foodborne disease outbreak surveillance over the period 2019 to 2023, with the exception of the COVID-19 pandemic years.

  Key statistic: *Campylobacter* spp. continued to be the most frequently reported bacterial pathogen causing infectious gastrointestinal disease in the UK, followed by non-typhoidal *Salmonella* spp. The proportional trends in causative agents, hospitalisation rates and associated foods implicated in the investigations were generally consistent with trends observed in the last decade with the exception of Shiga toxin-producing *E.coli* (STEC) and other diarrhoeagenic *E. coli* (DEC) in 2023.

- **Of the businesses inspected, analysis indicates an upward trend in food business hygiene compliance**. However, there is still a backlog in the number of businesses awaiting inspection.

  Key statistic: Between 2020/21 and 2023/24, an average of 96.8% of food businesses inspected in England, Wales, and Northern Ireland achieved a satisfactory or better Food Hygiene Rating Scheme (FHRS) rating. An average of 92.3% of inspected businesses in Scotland achieved a ‘Pass’ under the Food Hygiene Information Scheme (FHIS) between 2020/21 and 2023/24.

Cross-theme links

As outlined in Theme 3 Supply Chain Resilience, local authority food officer shortages are affecting the frequency of food business inspections and delivery of associated enforcement action. This could affect consumers’ access to safe food, and their trust in the effective regulation of the food system. Price inflation (covered in Theme 4 Food Security at Household Level) may also be linked to the prominence of food prices in consumers’ top self-reported concerns (prompted) in FSA and FSS consumer surveys.

Sub-theme 1: Consumer confidence

5.1.1 Consumer confidence in the food system and its regulation

Rationale

Food regulators play a critical role in ensuring businesses comply with the legal standards that protect the safety and authenticity of our food. Building trust in our system of food regulation maintains public confidence and safeguards demand; protecting our economy and enabling UK consumers to make informed choices about the food they eat.

In this section, we present an analysis of trends in consumer trust and confidence based on survey results from FSA and FSS. The FSA's Food and You 2 survey, which covers England, Wales and Northern Ireland, commenced its data collection in July 2020. Data is also presented for the period covering December 2020 to December 2023 from FSS's Food in Scotland Consumer Tracker survey which monitors attitudes, knowledge and reported behaviours relating to food amongst a representative sample of Scotland's population. FSS's survey is undertaken bi-annually with a consistent research methodology across each wave to ensure comparability.

Due to methodological differences between the FSA's Food and You 2 survey and the FSS Consumer Tracker survey, including the way people are selected to take part, how questions are worded, and when the surveys are carried out, it is not possible to make direct comparisons between the two.

Headline Evidence

Confidence in food safety and food labels

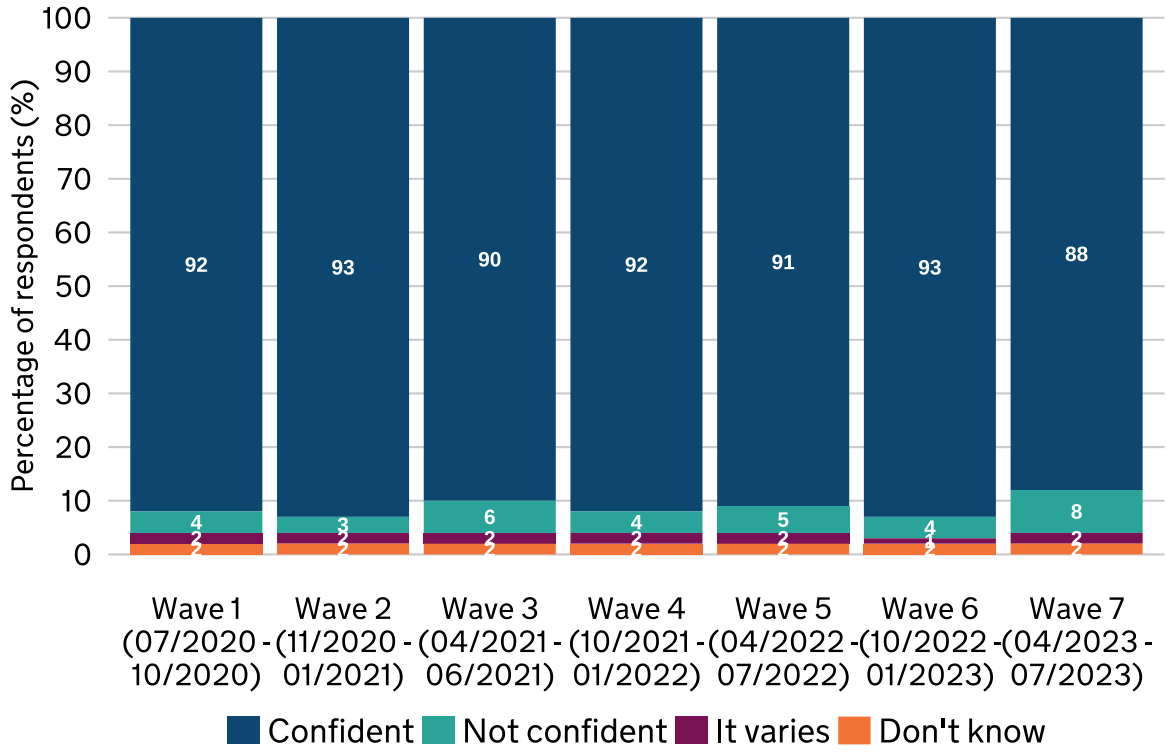
These consumer surveys represent recent evidence on levels of UK consumer confidence in food safety and food labels. They show that overall, levels of consumer confidence have remained relatively stable. Although some statistically significant fluctuations were identified in the Food and You 2 survey data during this period, these are small and cannot be attributed to any particular drivers.

Due to differences between the FSA's Food and You 2 survey and the FSS Consumer Tracker survey, including the way people are selected to take part, how questions are worded, and when the surveys are carried out, it is not possible to make direct comparisons between the two.

England, Wales and Northern Ireland

Figure 5.1.1a: The FSA's Food and You 2 survey respondents' confidence that food is safe to eat, July 2020 to July 2023

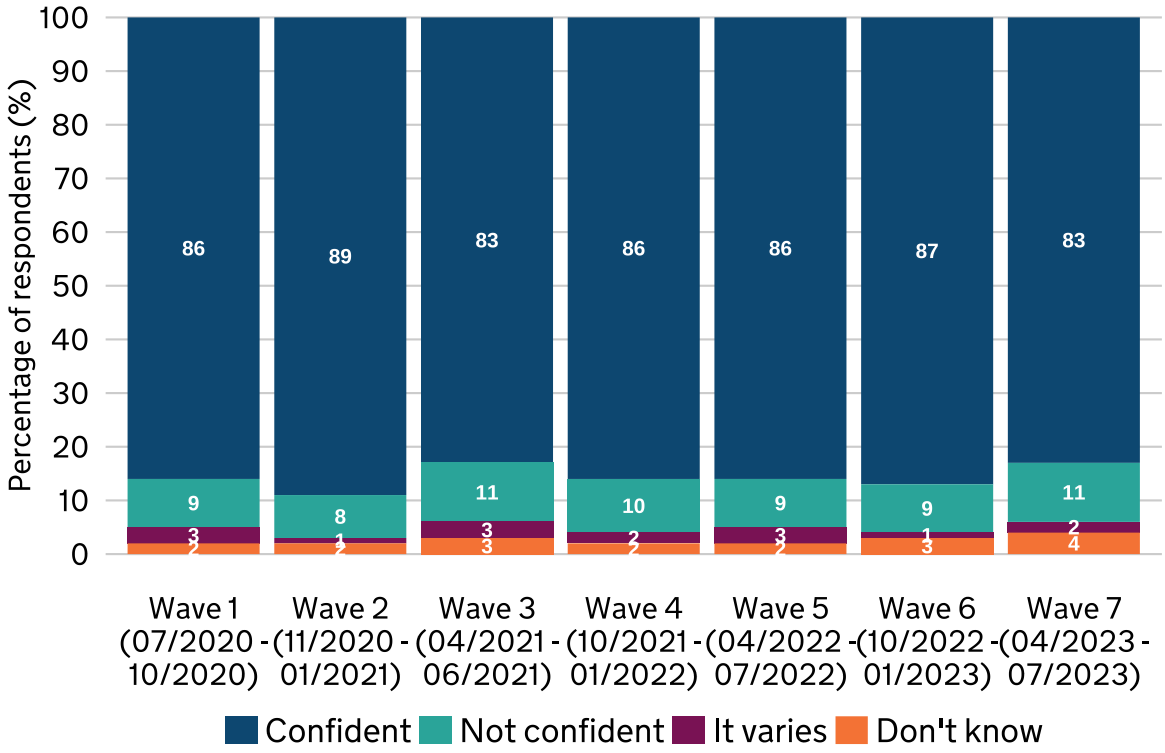
Source: Food and You 2, FSA



In England, Wales and Northern Ireland, respondents' confidence in food being safe to eat (Figure 5.1.1a) remained stable between July 2020 and July 2023. Data from Wave 7 (April-July 2023) showed that most respondents (88%) were confident that the food they buy is safe to eat. This is broadly in line with previous waves dating back to July 2020. However, there have been some fluctuations over time, with a statistically significant decrease in Waves 3 (2021) and 7 (2023). It is not possible to comment on drivers in these fluctuations.

Figure 5.1.1b: FSA respondents' confidence that information on food labels is accurate, July 2020 – July 2023

Source: Food and You 2, FSA

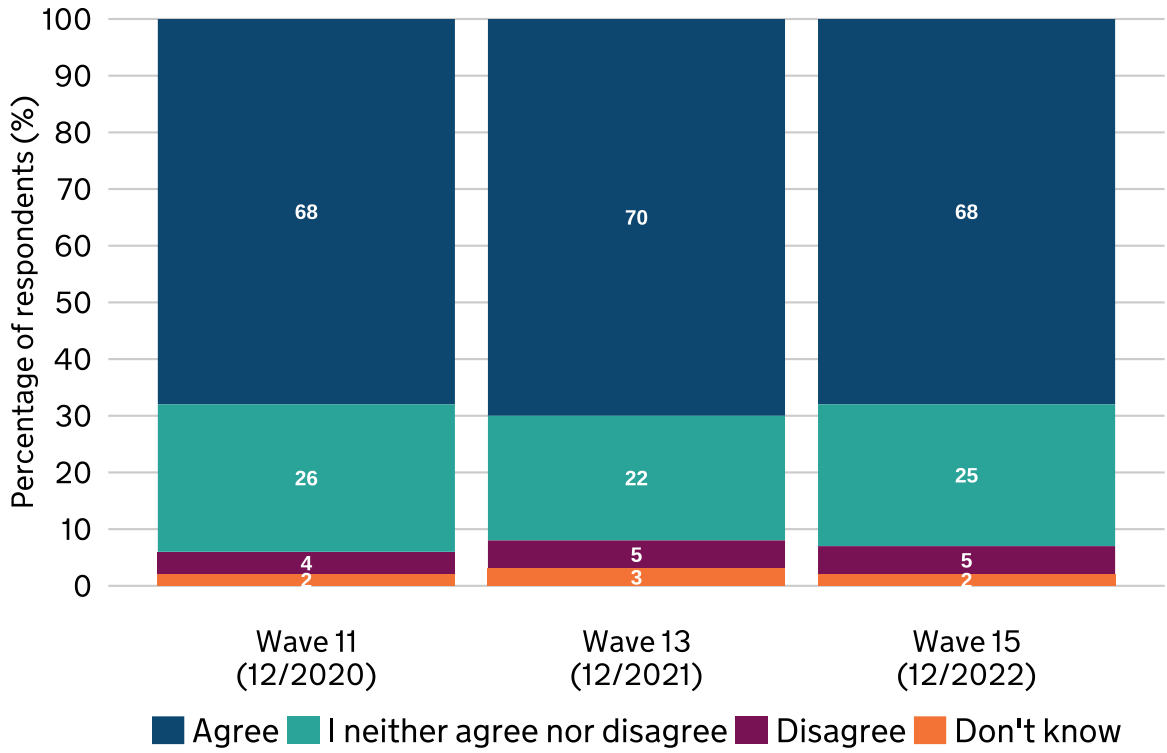


In England, Wales and Northern Ireland, data from Wave 7 (April-July 2023, Figure 5.1.1b) showed that respondents (83%) were confident that the information on food labels (for example, ingredients, nutritional information, country of origin) is accurate. This is broadly in line with previous waves dating back to July 2020. However, there have been some fluctuations over time, with a statistically significant decrease in Waves 3 (2021) and 7 (2023). It is not possible to comment on drivers in these fluctuations.

Scotland

Figure 5.1.1c: FSS respondents' trust in the information on food labels, December 2020, December 2021, December 2022

Source: Consumer Tracker survey, FSS, Waves 11, 13 and 15



In Scotland, respondents' trust in information on labels (Figure 5.1.1c) remained stable (68-70%) between 2020 and 2022 (this question was not asked in Waves 12 and 14 of the survey). However, a change in questions in Waves 16 and 17 means that no data is available for 2023.

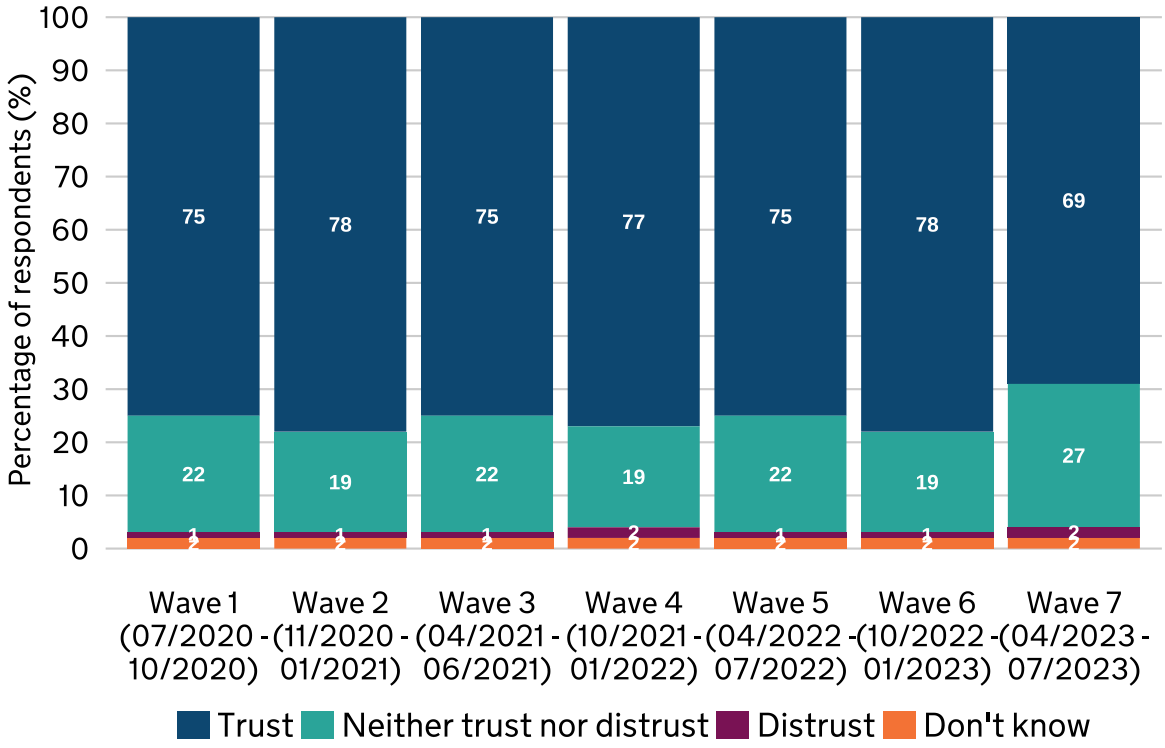
Trust in the regulator

These consumer surveys also monitor levels of awareness and trust in FSA and FSS. These insights ensure that the FSA and FSS remain responsive to public needs.

England, Wales and Northern Ireland

Figure 5.1.1d: FSA respondents' trust in the FSA, July 2020 to July 2023

Source: Food and You 2, FSA

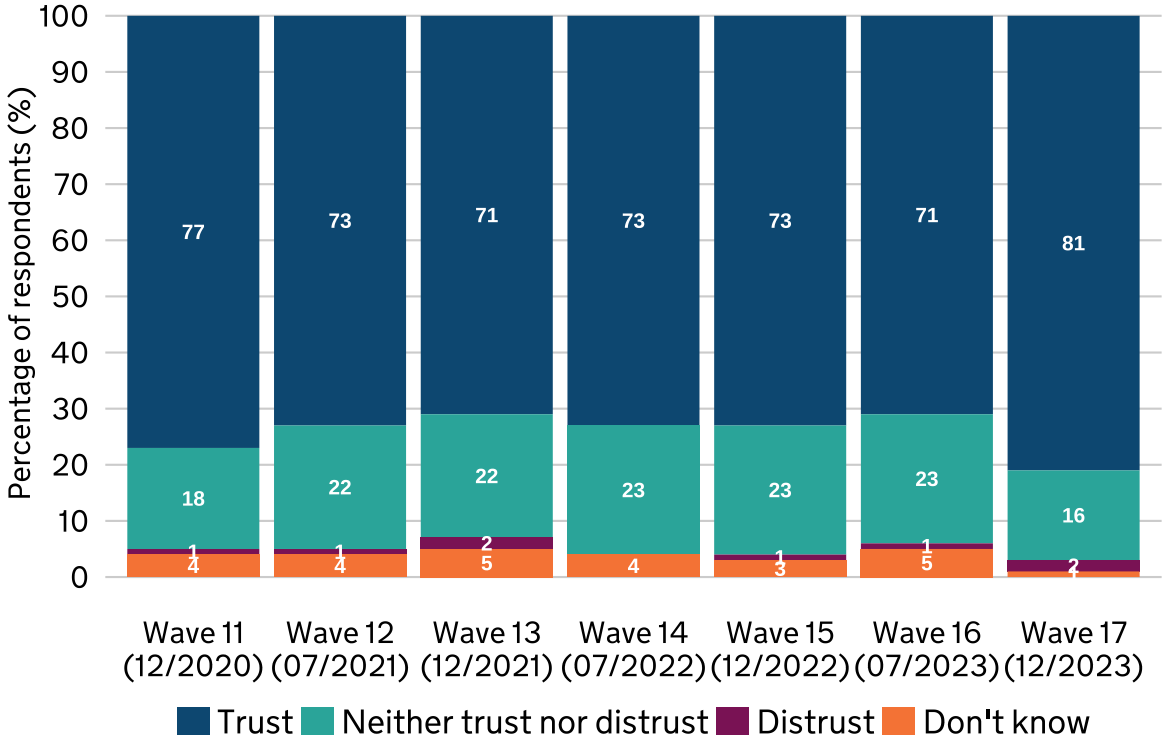


In England, Wales, and Northern Ireland, data from Wave 7 (April to July 2023, Figure 5.1.1d) showed that, of those who had some knowledge of the FSA, 69% trusted the FSA to do its job. While this is a statistically significant decrease from the previous survey, this is due to an increase in the proportion of respondents reporting that they 'neither trust nor distrust' the FSA, with distrust remaining low at 2%.

Scotland

Figure 5.1.1e: FSS respondents' trust in FSS, December 2020 to December 2023

Source: Consumer Tracker survey, FSS



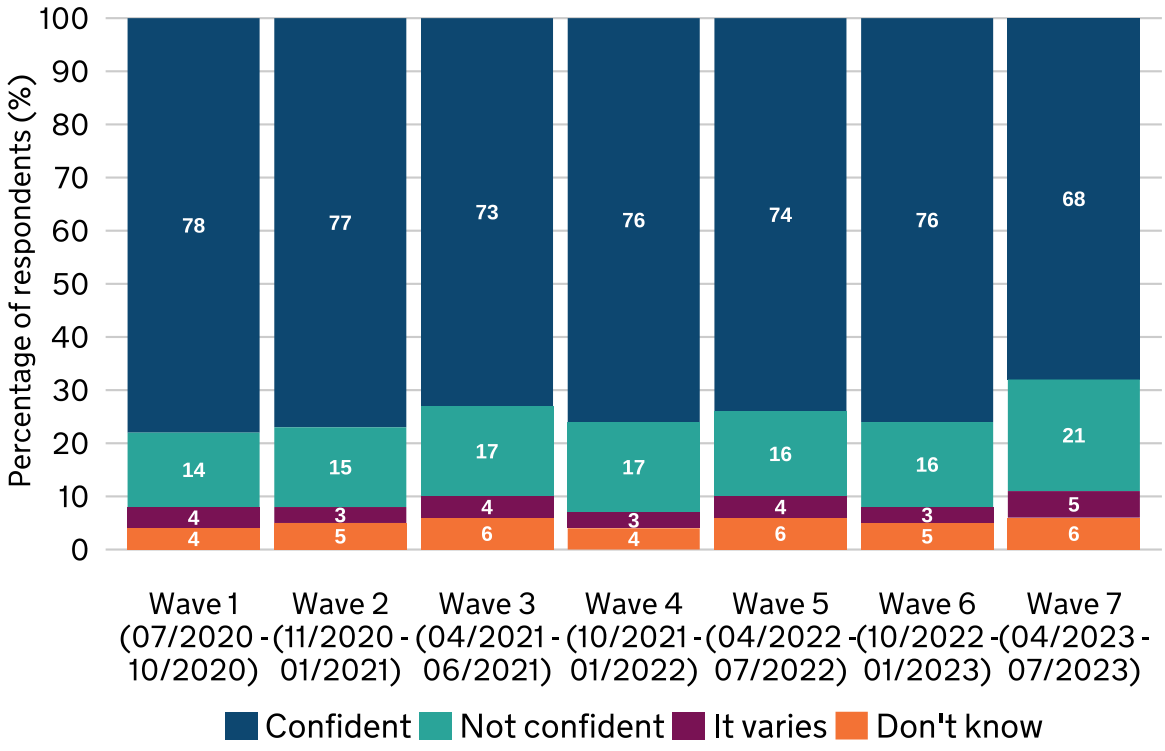
In Scotland, trust in FSS remained high and broadly stable between December 2020 and December 2023 (Figure 5.1.1e). The latest data (Wave 17, December 2023) shows that trust in FSS increased to 81% from 71% in the previous wave (Wave 16, July 2023). The proportion of respondents reporting that they 'neither trust nor distrust' FSS accounted for most of the difference with distrust remaining low at 2%.

Confidence in the food supply chain

England, Wales and Northern Ireland

Figure 5.1.1f: FSA respondents' confidence in the food supply chain, July 2020 – July 2023

Source: Food and You 2, FSA



In England, Wales and Northern Ireland, confidence in the overall food supply chain fluctuated slightly between July 2020 and July 2023.

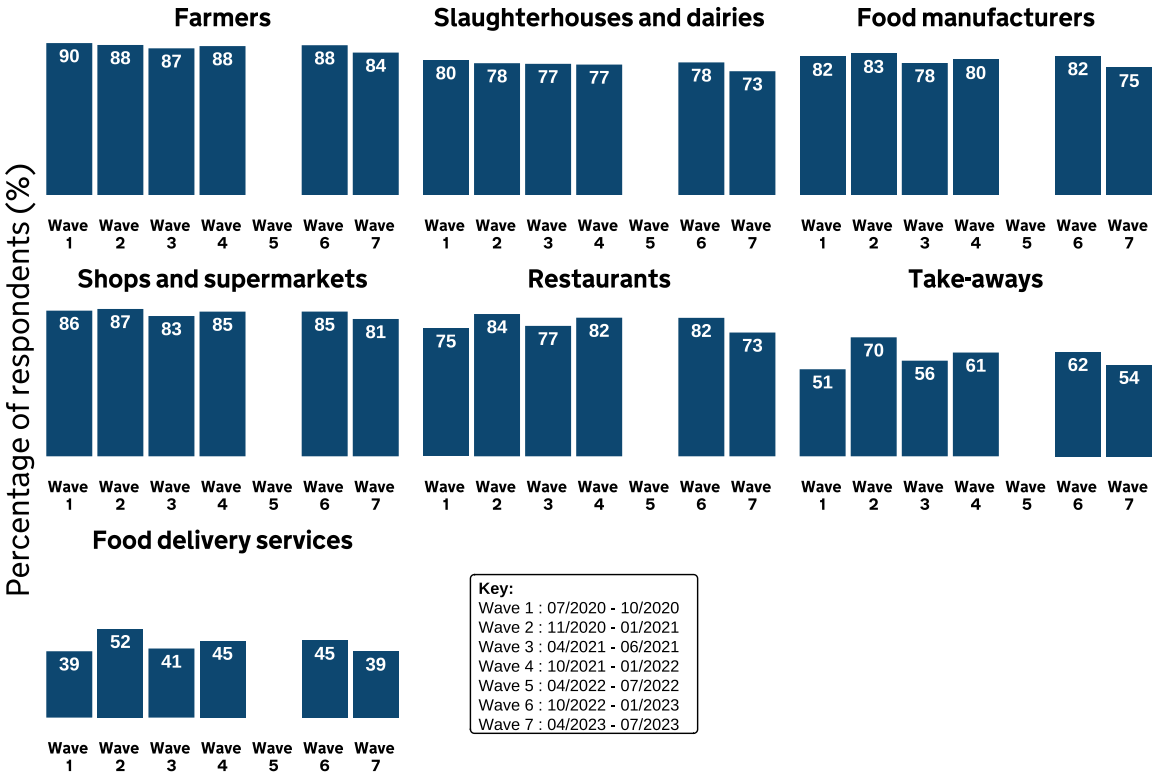
Confidence in food supply chain actors

England, Wales and Northern Ireland

Data from Wave 7 (April to July 2023, Figure 5.1.1f) indicated 68% of respondents were confident in the food supply chain, a statistically significant decrease from 76% in Wave 6 (October 2022 to January 2023).

Figure 5.1.1g: Consumers' confidence that actors in the food supply chain ensure that the food they buy is safe to eat (England, Wales and Northern Ireland)

Source: Food and You 2, FSA



In England, Wales and Northern Ireland, confidence in farmers, slaughterhouses and dairies, food manufacturers and shops and supermarkets has remained broadly stable since July 2020, with a statistically significant decline across all subgroups in Wave 7 (April to July 2023). Confidence in restaurants, takeaways and delivery services is more variable but shows no consistent trend either up or down over the reporting period.

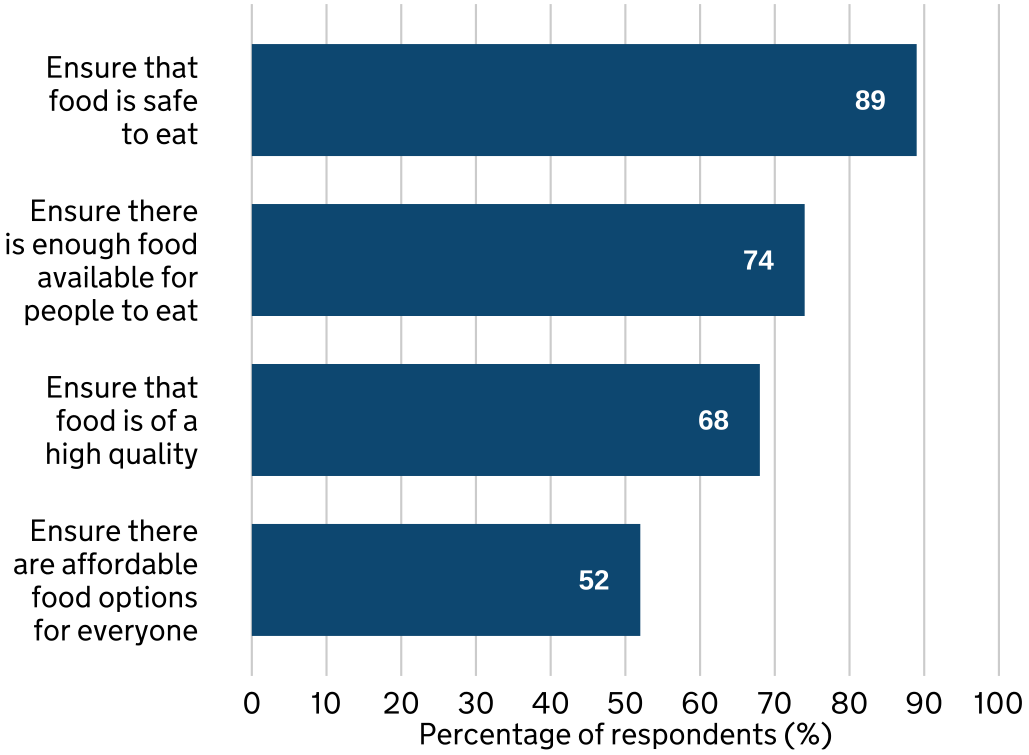
Respondents are more likely to report confidence in farmers, shops and supermarkets, and least likely to report confidence in takeaways and food delivery services. This pattern has been consistent since tracking began in 2020. A similar pattern was reported by Red Tractor in their 2022 UK Trust in Food Index.

The questions were not asked in Wave 5 of the survey, conducted between April and July 2022.

Scotland

Figure 5.1.1h: FSS respondents' confidence in UK food supply chain actors to ensure that food is safe to eat and is of high quality, Wave 17, December 2023

Source: Consumer Tracker survey, FSS Wave 17



In Scotland, the latest data (Wave 17, December 2023) shows that 89% of consumers were confident that those involved in the food supply chain (farmers, manufacturers, shops and supermarkets) ensure that food is safe to eat (Figure 5.1.1h). Two-thirds (68%) of respondents reported confidence in food supply chain actors to ensure food is of a high quality.

Supporting evidence

UK-wide

Some external studies indicate that food is among the most trusted sectors. The 2024 Edelman Trust Barometer conducted across 28 countries reported that food was among the top 5 trusted sectors, with 72% of respondents trusting businesses in the food and beverage sector. Similarly, in the UK, Red Tractor reported that despite trust in food declining between 2021 and 2022, food remained among the

top three most trusted institutions in their 2022 Trust in Food Index with 73% of respondents trusting UK food.

5.1.2 Consumer Concerns

Rationale

The FSA and FSS surveys also monitor consumer concerns in relation to food. This section offers a summary of the top food-related concerns raised by consumers through these surveys and examines how these concerns have evolved over time.

Due to differences between the FSA's Food and You 2 survey and the FSS's Consumer Tracker survey, including the way people are selected to take part, how questions are worded, and when the surveys are carried out, it is not possible to make direct comparisons between the two.

Data from Food and You 2, which covers England, Wales and Northern Ireland, is presented from its first wave in July 2020. Data from FSS's Consumer Tracker survey has been presented from Wave 11, which covers the period starting from December 2020.

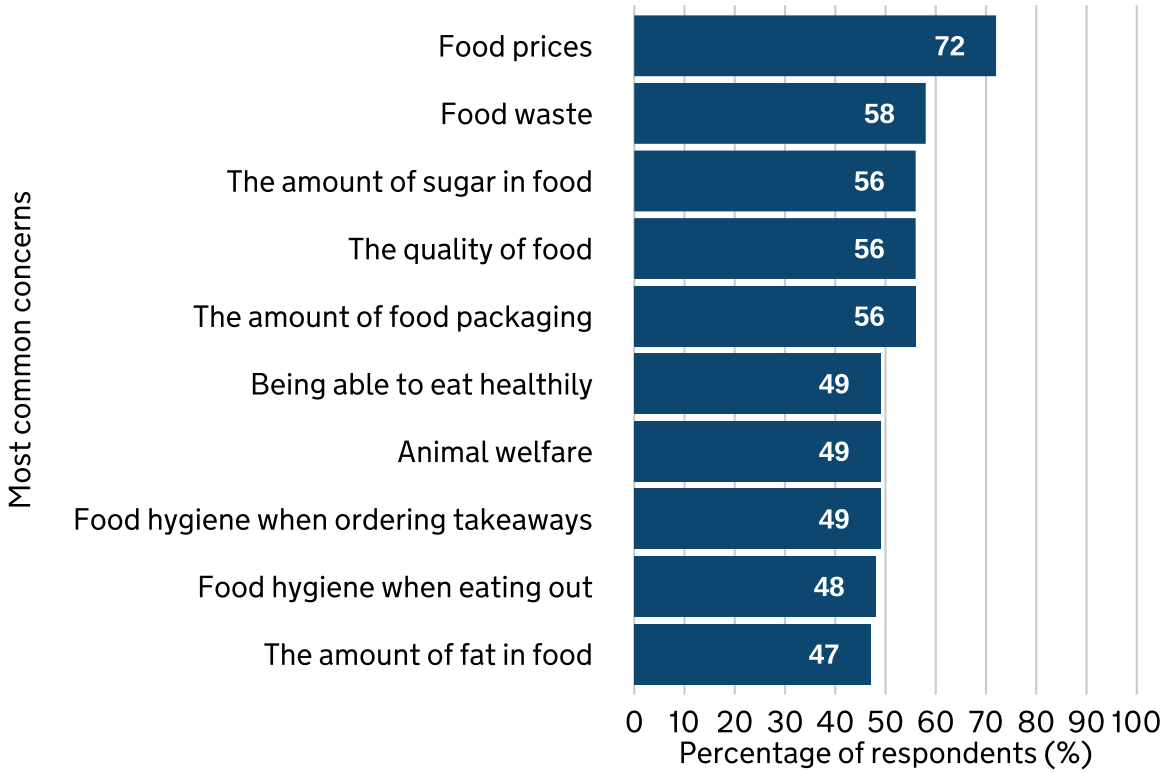
Headline evidence

Consumers' top 10 most reported concerns

England, Wales and Northern Ireland

Figure 5.1.2a: FSA respondents' top 10 most common prompted concerns, Food and You 2, Wave 7, April to July 2023

Source: Food and You 2, FSA, Wave 7



Consumers' reported concerns have varied over time. Although most consumers (72%) have no concerns about the food they eat, the proportion reporting a concern (unprompted) significantly increased in the Wave 7 survey from 18% in late 2022 to 28% in mid-2023. Those who reported having a concern were asked to briefly explain what their concerns were about the food they eat. The most common unprompted concerns in the Wave 7 (2023) survey related to food production methods (33%) and nutrition and health (30%).

When presented with a list of food-related concerns, 72% of consumers reported concerns about food prices in 2023, a significant increase from 42% in Wave 3 (April to June 2021) in the year the last UK Food Security Report (UKFSR) was published.

Concerns about the affordability of food also increased significantly with the proportion of consumers reporting that they were highly concerned about food affordability rising from 26% at the end of 2020 to 55% in 2023. Consumers report making adjustments to manage increased costs, including using cheaper cooking methods, selecting cheaper alternatives to branded goods or buying reduced or discounted foods.

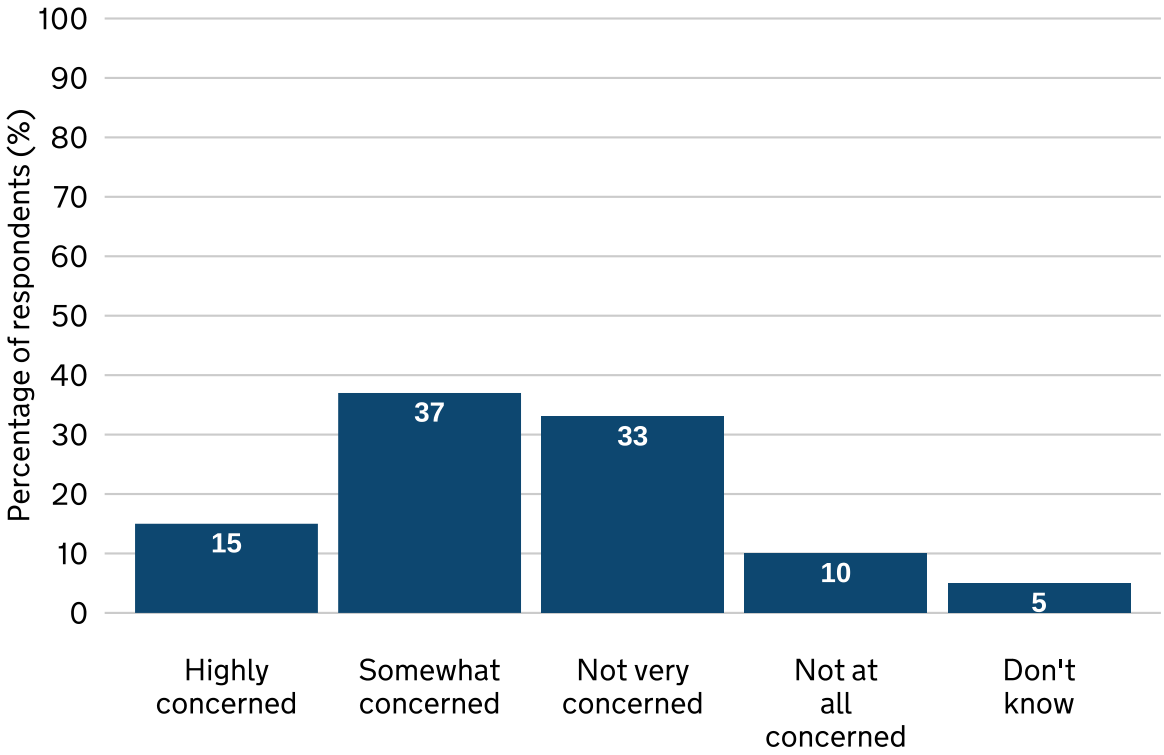
When asked the extent to which they were concerned about a number of specific food issues, 28% reported being highly concerned about food being produced sustainably in the Wave 7 survey (2023), a statistically significant decrease from 33% in 2021.

Concerns about food availability

England, Wales and Northern Ireland

Figure 5.1.2b: FSA respondents' concern about food availability, Wave 7, April to July 2023

Source: Food and You 2, FSA, Wave 7, April – July 2023

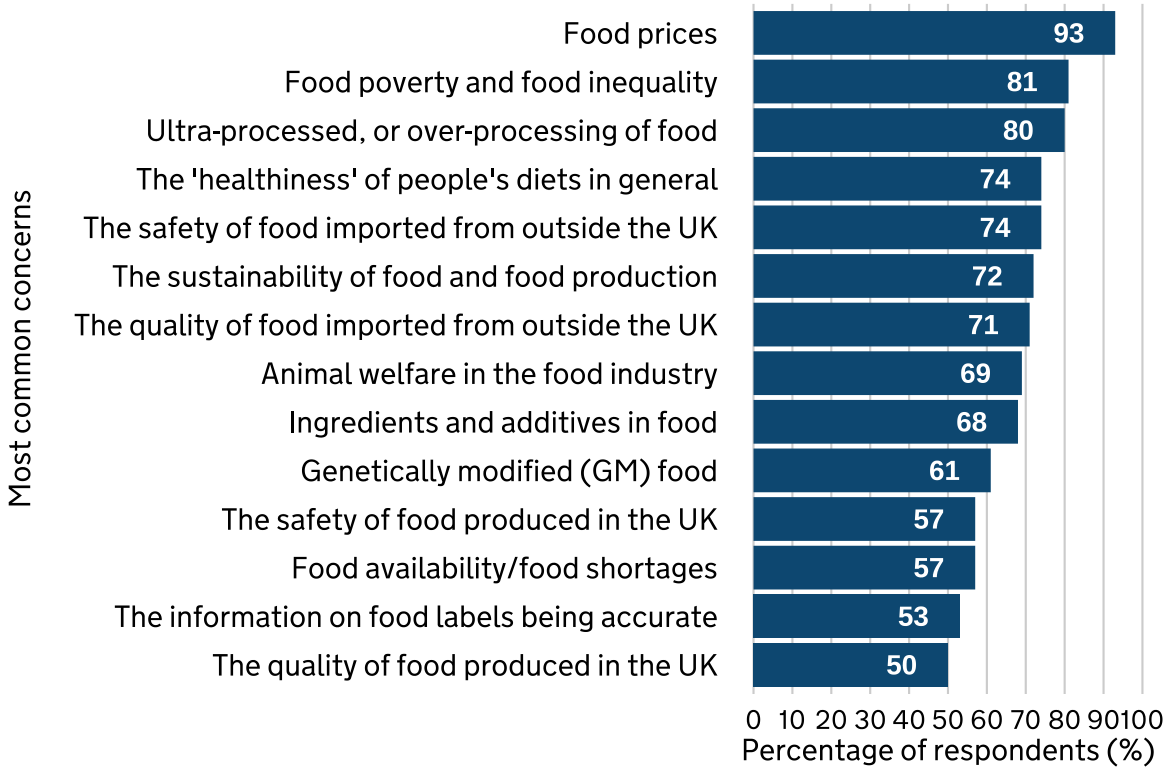


Respondents in England, Wales and Northern Ireland were asked how concerned they were about the availability of a wide variety of food. Wave 7 findings (April to July 2023, Figure 5.1.2b) indicate that 15% were highly concerned about this, broadly in line with previous waves of the survey.

Scotland

Figure 5.1.2c: FSS respondents' most common prompted concerns, Wave 17, December 2023

Source: Consumer Tracker survey, FSS, Wave 17



The latest data for Scotland (Wave 17, December 2023, Figure 5.1.2c) indicates that 93% of consumers reported concern about the cost of food, an increase from 69% reported in 2021.

In Scotland, after food prices (93%), 81% of respondents reported concerns about food poverty and food inequality. Concerns around the healthiness of food and the way it was produced also featured prominently, with 80% of respondents concerned about ultra-processed or over-processing of food and 74% about the "healthiness" of people's diets more generally.

68% of respondents reported concerns about ingredients and additives and 61% about genetically modified foods. In addition, 72% of respondents were worried about the sustainability of food and food production, with the same percentage identifying the safety of food imported from abroad as a concern.

Supporting evidence

UK-wide

In 2022 FSA and FSS conducted a study to explore consumers' interests, needs and concerns around food. This study also highlighted that food prices were highly concerning for consumers, with 20% of survey respondents spontaneously mentioning food prices as an area of future concern, well ahead of any other spontaneous mentions.

When thinking about the future of food in the UK over the next 3 years, consumers were most concerned about the price of food (76% were quite or extremely concerned) and more than two thirds (68%) said they were worried about the cost of healthy food in particular. More than half (53%) said they felt "priced out" of buying healthy food. Respondents also found it difficult to juggle competing drivers of food choices (for example price, convenience, health), with price often prioritised, leading people to feel they were compromising on health, environment and wider ethical values.

Consumers viewed the top priorities for government, in order of priority, as: supporting British farmers and producers, accessing healthy food at affordable prices, high standards of food safety and hygiene, access to low-priced food that is not over-processed and meets good quality standards, and reducing food waste in the food chain.

Monitoring consumers' food safety behaviour

In addition to monitoring consumer concerns and confidence, the FSA uses the Food and You 2 survey to monitor consumers' knowledge of, and self-reported behaviours on, food storage, preparation, and cooking. This information, which is linked to the utilisation dimension of food security, helps to inform FSA policy decisions (through feeding into risk or impact assessments) and consumer engagement activities (such as communication campaigns throughout the year).

Indicator 5.2.4 Foodborne disease outbreak surveillance looks in more detail at the prevalence of foodborne pathogens and the cost to UK society. As most, but not all, cases of illness associated with these pathogens are food-related, consumers' in-home behaviours and the impact of food safety behaviours should be considered.

Findings from Wave 6 of Food and You 2 (conducted between October 2022 and January 2023) indicate that the majority of respondents follow recommendations to wash hands before preparing or cooking food (72% reported always doing this) or immediately after handling raw meat, poultry or fish (91% reported always doing this). 89% of respondents also reported that they never eat chicken or turkey when it is pink or has pink juices, as recommended by the FSA.

However, some findings indicate that consumers may be undertaking more risky food safety behaviours. For example, 40% reported washing raw chicken at least occasionally, against the FSA's recommendation. Although 65% recognised the use-by date as the information which shows that food is no longer safe to eat, respondents reported eating food past the use-by date. Bagged salad (72%) and cheese (72%) were the foods respondents were most likely to report eating at any point after the use-by date.

The Kitchen Life 2 study, published by the FSA in 2023, explored food safety behaviours in real life domestic and business kitchens. Using a range of data collection methods (including motion sensitive cameras, surveys, interviews, food diaries and fridge/freezer thermometers), the study provided much greater insight into the potential food safety risks consumers are taking in their homes and in business kitchens than self-reported behaviours alone would. It found high-risk food safety practices (such as not washing hands with soap after touching meat, fish and poultry and reusing a tea towel or cloth for multiple purposes) were regularly observed in household and business kitchens. In many cases, participants knew the correct practice, but other influences on their behaviour were stronger (such as ease, or beliefs about personal risk of illness).

Sub-theme 2: Food Safety and Authenticity

5.2.1 Surveillance Sampling

Rationale

National food surveillance programmes help to verify the effectiveness of our controls for food safety and standards by monitoring for the presence of recognised or emerging risks across a range of different products. Safety and authenticity are vital to food security as unsafe food could lead to foodborne illness, with onward impacts on individual or community health. Labelling non-compliance can also adversely affect consumers with food hypersensitivities and damage consumer confidence.

Headline Evidence

While FSA and FSS have their own sampling programmes, local authorities also carry out sampling as part of the inspections they conduct in businesses to verify food safety and standards. Theme 3 Indicator 3.1.3 Labour and Skills sets out trends in local authority sampling activities between 2013/14 and 2023/24. These trends show the number of food samples taken by local authorities has declined

over the past 10 years, in part due to reduction seen in local authority resourcing as well as overall financial constraints.

For an update on work to build the UK's international surveillance capacity, see the Food Authenticity Network (FAN) case study below.

Supporting evidence

Residues Control Programme

Legislation requires the analyses of samples from food producing animals for residues of authorised veterinary medicines, prohibited substances and various contaminants. This requires an annual surveillance plan which is operated by the Veterinary Medicines Directorate (VMD), an executive agency of Defra. VMD is the Competent Authority responsible for implementation and coordination of the Residues Control Programme (RCP) in Great Britain.

The GB RCP facilitates the collection of circa 33,000 samples a year, with the final number directly related to level of production for each commodity group. These results of testing these samples of red meat, poultry, eggs, fish, milk and honey (including samples of offal, urine, feed and serum) are published online. While the programme is not designed and implemented to draw statistical conclusions from its findings, the general level of residues non-compliance each year has been demonstrated to be very low, at well under 1% year on year (and is, in fact, closer to 0.3%).

Pesticide Residues Monitoring Programme

National monitoring programmes analyse levels of pesticides in UK food supply. The Health and Safety Executive (HSE) are responsible for delivering these programmes on behalf of Defra, the Northern Ireland Executive, the Scottish Government and the Welsh Government. The programmes are risk-based and provide assurance that food in the UK complies with Maximum Residue Levels (MRLs) set by law, affording a high level of protection for consumers. They are not designed nor implemented to draw statistical conclusions, but the level of non-compliance is consistently low at around 2%. See UK's competent authority annual reports for 2020, 2021 and 2022. Each year advice is sought from the UK Expert Committee on Pesticide Residues in Food (PRiF) on the planning and operational delivery of these national monitoring programmes. Information on the PRiF is available here.

Case study 1: The Food Authenticity Network

The UK also supports surveillance activity on an international level. FAN is a global community of over 5,100 members, bringing together analysts, industry experts, enforcement authorities, academics and other stakeholders to communicate and facilitate knowledge exchange about food authenticity and food fraud prevention.

FAN ensures that the UK has access to a resilient network of laboratories providing fit for purpose testing to address food authenticity and food fraud issues. FAN worked with many of the 16 Centres of Expertise (CoEs) listed on its website to develop an Emergency Preparedness Framework which sets out how a collective technical response can be formulated during an emergency food fraud incident. In 2024, FAN invited the CoEs to partake in a simulated food fraud incident exercise to test the Framework. Following this exercise, the Framework was modified to further increase its robustness.

In 2023, over 43,400 users from 166 countries accessed FAN's open access website, which disseminates curated information on guidance, tools, training and laboratory expertise on addressing food authenticity and food fraud challenges. Recent additions include the collation of the major global initiatives to mitigate food fraud and a food security resource base to signpost stakeholders to information related to potential or actual disruption to the food and drink supply chain resulting from the war in Ukraine. In 2023 FAN collaborated with 3 leading food horizon-scanning services to analyse data on official food fraud incident reports, concluding that global food fraud incidents remained fairly consistent across the year and did not increase during 2023.

5.2.2 Food safety incidents, alerts, and recalls

Rationale

A food incident occurs when concerns around the safety or quality of food may require action to protect consumers. Notifications of food incidents can come from many sources, including local authorities, port health authorities, government organisations, the food industry, other countries, and consumers themselves. While it is unlikely that a food safety incident would cause an overall shortage to food supply, it could disrupt the supply of products within the food chain and undermine consumer confidence in food safety.

Incident numbers do not indicate the severity of each incident and are influenced by several factors. The number of recorded food and feed incidents is not in itself an indicator of any changes in risks to the UK's food security; however, category breakdowns can give an insight into areas of concern and risks that may affect different parts of the food chain. The FSA, FSS and their partner organisations

regularly review the data to help detect emerging issues that need to be addressed through strategies aimed at preventing future incidents and interventions for protecting public health.

Data on food and feed incidents provide evidence where there may be specific problems in the food supply chain. The number of incidents does not necessarily reflect the nature, severity nor where impacts are felt. For example, FSS records incidents where the business involved was Scottish even though affected consumers may be anywhere in the UK. This is in addition to FSA incidents where the product has been distributed to Scotland or there is an impact to Scottish consumers in some way. Changes in incidents do not necessarily indicate changes in food safety and standards as the way incidents are recorded by the FSA and FSS have changed over time and both organisations apply different approaches to the way incidents are recorded and managed. As a result, there may be a degree of double-counting if one were to add up FSA and FSS incidents.

Once a food incident has been identified, the matter is investigated to remove any harmful food from the market, with businesses withdrawing or recalling the food. These actions are led by both industry and local authorities, with the latter the main enforcement authority for UK food businesses, liaising closely with FSA and FSS. This partnership approach is central to the successful management of an incident. Local authorities, FSA and FSS will then often issue alerts to let consumers and food businesses know about the issue and trigger certain actions they need to take.

Data has been presented from 2017/18 due to FSS moving to a modified data reporting format in 2017.

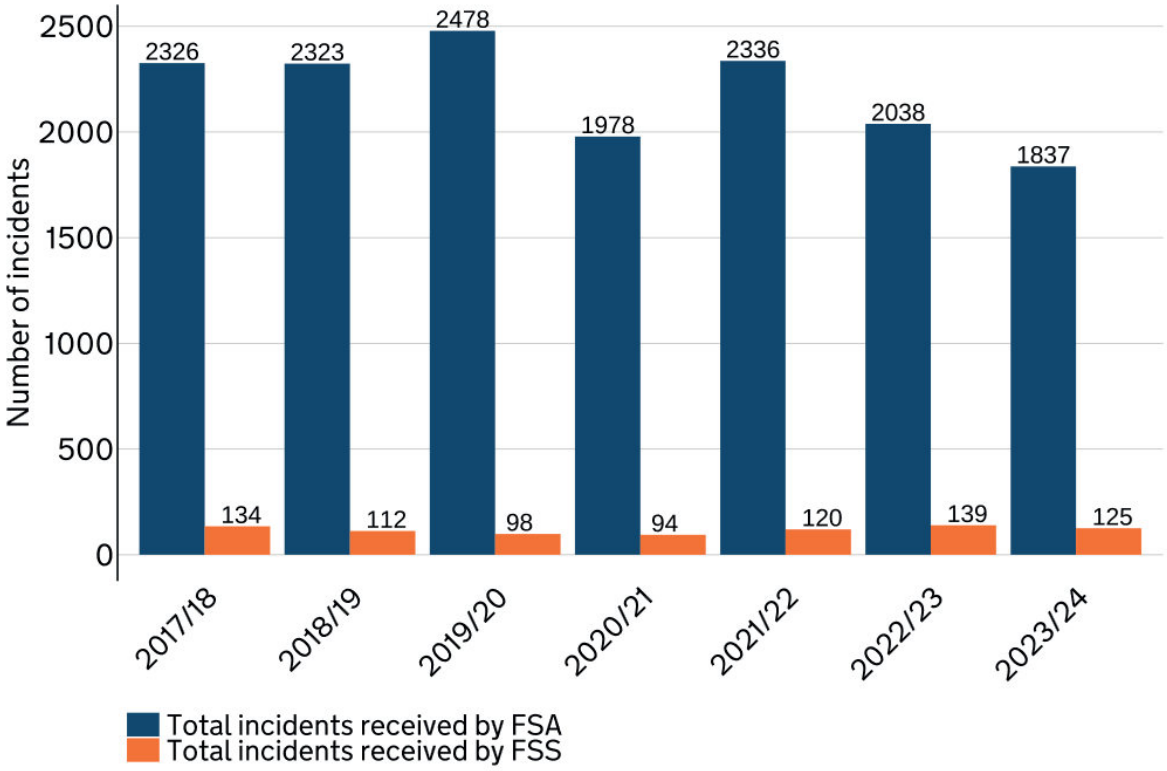
- An **Allergy Alert** is published when the product has been, or is being, recalled from consumers because allergen information on food labels is either undeclared (including not in English) or incorrect.
- A **Product Recall Information Notice (PRIN)** is published when the product has been, or is being, recalled from consumers because there are concerns about the safety of a product, most often due to the contamination, mis-packing or mislabelling of products.
- A **Food Alert For Action (FAFA)** is issued to local authorities and published for consumers when the distribution of products is unclear or when a food business is not taking the required steps to remove products from sale that might be unsafe and remedial action from local authorities or consumers is required.

Headline Evidence

Total number of incident notifications

Figure 5.2.2a: Total number of incident notifications received by the FSA and FSS between 2017/18 and 2023/24

Source: FSA and FSS incident databases



In England, Wales and Northern Ireland, an average of 2,133 food safety incidents were recorded annually between 2019/20 and 2023/24, with the range varying from 2,478 in 2019/20 – 1,837 in 2023/24. In Scotland, an average of 115 incidents were recorded annually between 2019/20 and 2023/24, with the range varying from 94 in 2020/21 to 139 in 2022/23.

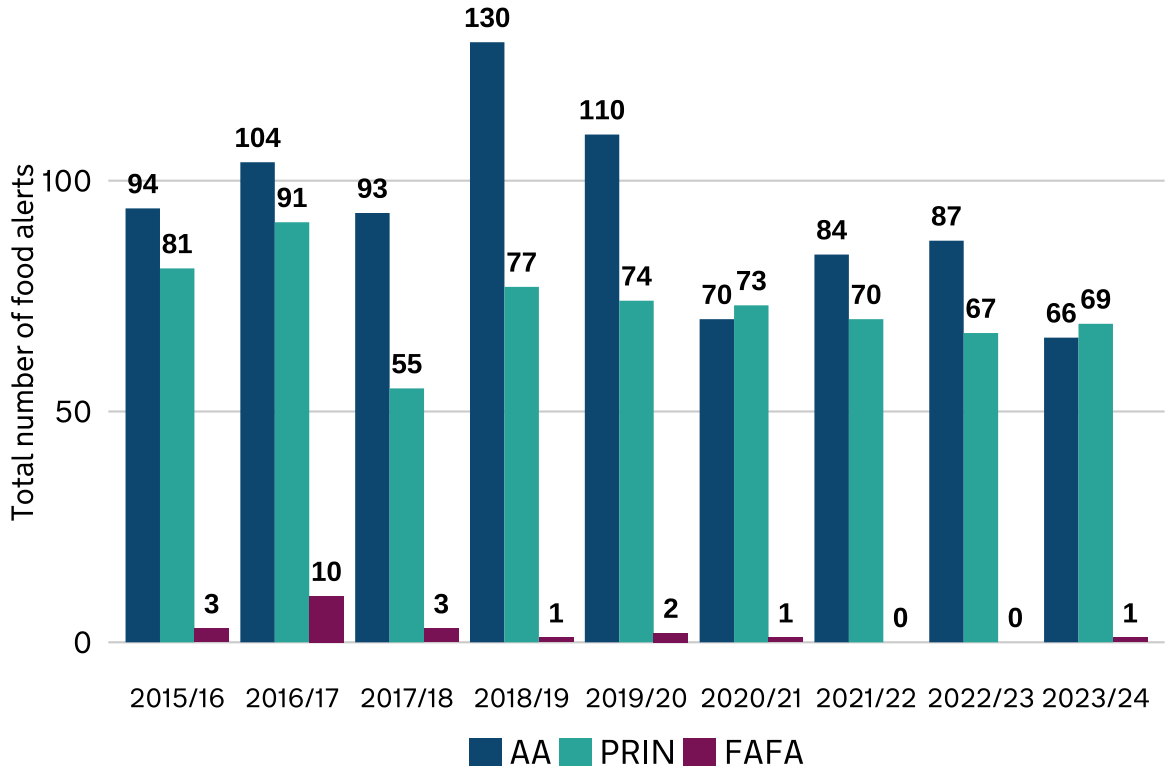
Since publication of the last UKFSR, approximately 26% of all incidents reported (between 2021/22 and 2023/24) related to the identification of microorganisms with the potential to cause illness (such as *E.coli, Listeria* and *Salmonella*); and required action to be taken by authorities and food businesses to protect consumers.

In 2017/18, FSS moved to a new data reporting format. For this reason, there may be some duplications in the incident figures if the same incident is investigated by both the FSA and FSS. The numbers are provided separately for both the FSA and FSS.

Total number of food alerts

Figure 5.2.2b: Total number of food alerts issued by the UK, from 2015/16 to 2023/24

Source: FSA and FSS incident databases



FSA and FSS issued 136 food alerts in 2023/24 compared with 154 alerts in 2022/23 (Figure 5.2.2b). This reduction was primarily driven by the fall in Allergy Alerts. FSA and FSS published a total of 66 Allergy Alerts in 2023/24 compared with 87 Allergy Alerts in 2022/23, a 24% decrease.

FSA and FSS published a total of 69 PRINs during 2023/24, a level consistent with that seen in the previous 5 years. Very few FAFAs have been issued, just 4 since 2019/20, suggesting that most food business operators comply with safety requirements laid out in law. The number of FAFAs issued in the UK remained low between 2015/16 and 2023/24 despite one anomalous data point in 2016/17.

Supporting evidence

In 2023/24, there was a 10% decrease in incident reporting across the 4 nations compared to 2022/23 (Figure 5.2.2a).

Microbiological incident reports mainly included the detection of *Salmonella*; however, incidents caused by Shiga toxin-producing *E.coli* (STEC) (both O157 and non-O157) were also reported during this period and included 7 FSA-led outbreaks and one FSS-led outbreak. Microbiological incidents include incidents involving pathogenic microorganisms, such as bacteria (e.g., *Salmonella, E. coli*) and viruses (e.g., *Norovirus*).

Across the UK, the most common type of hazard involved in food incidents was pathogenic microorganisms, accounting for 26% of all incidents since 2021/22. The presence of pathogens in food has the potential to cause foodborne illnesses, which can result in symptoms ranging from mild gastrointestinal discomfort to life-threatening conditions

Total incident notifications

England, Wales and Northern Ireland

The number of FSA incidents shows fluctuations between 2017/18 and 2023/24 (Figure 5.2.2a), with a peak of 2,478 incidents in 2019/20. The number of incidents fell in subsequent years, particularly in 2020/2021 and 2023/2024. The drop in 2020/21 is likely the result of the COVID-19 pandemic affecting normal operations, leading to fewer reported incidents due to lockdowns and changes in food industry practices.

The FSA was notified of 2,336 food and feed safety incidents in total during 2021/22, which represented a return to volumes similar to pre-pandemic levels. It was notified of 2,038 food and feed safety incidents during 2022/23, a 13% decrease from 2021/22. Fluctuation in incident numbers year-on-year is common. The volume fluctuates for reasons including, but not limited to, new regulations coming into force, changing trends in consumer behaviours, and/or a persistent large-scale issue (for example, ethylene oxide in 2020/2021).

Scotland

In Scotland, the total number of incidents increased by 28% between 2020/21 and 2021/22, with a further 16% increase observed in 2022/23 (Figure 5.2.2a). However, this increase could be at least partially attributed to a return to pre-pandemic levels of reporting during this period. Increases in incident reporting

were identified across several categories including allergens, animal feed, chemical, microbiological and regulatory breaches. As noted above, fluctuations in reporting are to be expected due to changes in regulations, surveillance activities, environmental factors and consumer behaviours, and therefore do not necessarily point to a decline in standards.

Case study 2: Listeria monocytogenes outbreak linked to smoked fish

Introduction

Listeriosis is a rare disease in the UK caused by *Listeria monocytogenes*. It can cause severe symptoms, particularly for clinically vulnerable groups such as the elderly, rendering it a public health concern.

Identification of *Listeria monocytogenes* from a patient sample is notifiable in the UK. Public health investigation and follow-up is attempted for all reported cases of listeriosis as an integral part of the enhanced surveillance system for listeriosis. This includes completion of a questionnaire by individuals diagnosed with listeriosis on what foods they have eaten prior to the onset of illness.

Description and analysis

An outbreak of listeriosis, involving 20 cases and 3 deaths, was identified and investigated between January 2021 and July 2023. An incident management team (IMT) comprising FSS, the FSA, Public Health Scotland (PHS), the UK Health Security Agency (UKHSA) and local authorities, was established to investigate the outbreak.

Food histories were taken from individuals diagnosed with listeriosis. Smoked fish consumption linked 17 of the 19 cases (89%), 8 of whom had purchased it from one major UK retailer. The link was subsequently confirmed by microbiological evidence, with the outbreak strain of *Listeria monocytogenes* detected in smoked fish sampled during the investigations, although it was never found in products at non-compliant levels.

Several approaches were taken to ensure consumers were protected, including:

- investigations to identify the source of the contamination and trace affected products;
- a precautionary voluntary recall of all products shown to be contaminated by the outbreak strain, even though levels were below legal limits;
- publication of an updated FSA/FSS smoked fish risk assessment in July 2023; and

- communications to increase consumer awareness of the risks to vulnerable groups from cold-smoked fish products including updated advice to consumers during the outbreak, FSA and FSS social media communication activity, and on-pack labelling by the retailer.

Conclusion

The outbreak investigation provided lessons in how to reach vulnerable consumers with risk messaging, the value of Whole Genome Sequencing data in assessing the risk, and the importance of working with businesses to protect consumers. The case study illustrates how food safety and public health authorities collaborate during the investigation of high profile, complex food safety incidents to ensure appropriate action is taken to prevent further harm to vulnerable consumers.

Case study 3: Determining increased risk of Vibrio in seafood linked to climate change

Introduction

Previous themes set out various links between disease and climate. As referenced in Theme 2 UK Food Supply Sources Indicator 2.1.5 , UK waters have progressively become warmer over the past 100 years, with average winter temperatures in particular increasing over the past 20 years. Infectious diseases such as *vibriosis* are sensitive to climate change, and warmer temperatures can alter the geographical distribution of these diseases.

Vibrio spp., for example, were traditionally observed in tropical and sub-tropical locations. However, due to changes in climate, their distribution is now changing. Warmer sea surface temperatures (SST) can allow pathogens such as *Vibrio* spp. to get a foothold in British water, with the potential to increase the risk of vibriosis in the human population.

Discussion

Vibrio spp. can result in foodborne illness when contaminated shellfish are consumed raw or lightly cooked. *Vibrio vulnificus* is the most common cause of vibriosis and is linked to the consumption of raw oysters; usually resulting in diarrhoea, nausea and vomiting. However, infections involving some species (e.g. *Vibrio cholerae)* can be dangerous for individuals with a weak immune system. A recent assessment of the public health aspects of *Vibrio* spp. by the European Food Safety Authority showed an increase in the risk of antimicrobial resistance.

Shellfish are not currently routinely screened for *Vibrio* spp. by the food industry. Monitoring is therefore important to assess the potential impacts of rising SSTs on

their ability to enter the UK food chain. FSA and FSS monitor 'signals' as defined below, covering many different food safety risks which may impact the UK. This work is focused on prevention through building an understanding of what is happening in the UK compared with the rest of the world. Signal numbers for *Vibrio* have increased steadily over a period of monitoring since 2020, with a clear spike from 13 signals in 2021 to 63 in 2023. The top 5 countries of origin for signals were Ecuador, the United States, Vietnam, Venezuela and India. While overall figures for 2024 are pending, there were 13 signals between January and July 2024.

FSA and FSS have investigated 5 UK incidents involving *Vibrio* in shellfish products reported during 2022 and 2023; while 4 of the 5 related to imported products, one was the first reported incident in UK waters since records began. There have been no *Vibrio*-related foodborne illnesses reported during this time.

FSA and FSS have also linked to UKHSA's and other public health bodies' syndromic monitoring of human cases in the UK, to determine any move from cases linked to travel to cases linked to food consumption, which so far has not been apparent.

When presenting *Vibrio* signal data to the food industry for feedback, they highlighted that the methods used by commercial laboratories give no results on levels of contamination. In response, FSA and FSS provided industry with details of laboratories that can provide this service. This will allow industry to better track levels of contamination.

Next steps

FSA and FSS will continue to monitor the levels of signals, incidents and cases, and review any need for tighter management of the risks in this area.

5.2.3 Foodborne pathogen surveillance

Rationale

Published estimates suggest that around one in four people in the UK suffers an episode of infectious gastrointestinal disease each year and foodborne disease is estimated to cost the UK society £10.4 billion annually. Non-typhoidal *Salmonella* spp., *Campylobacter* spp., *Listeria monocytogenes* and Shiga toxin-producing *Escherichia coli* O157 (STEC O157), are considered priority pathogens for national surveillance due to the associated burden of disease and the substantial implications for public health and food safety in the UK.

The UK Health Security Agency, Public Health Wales, Public Health Scotland and Public Health Agency Northern Ireland are the agencies responsible for the surveillance of infectious diseases, including gastrointestinal pathogens that cause

foodborne disease. Surveillance is defined as the systematic collection, analysis and interpretation of data essential to the planning, implementation and evaluation of public health practice, and the timely dissemination of this information for public health action. Laboratory testing data and epidemiological information on each reported case is recorded in national surveillance databases and case management systems.

While not all gastrointestinal infections caused by organisms such as bacteria, viruses or protozoa are foodborne and not all foodborne diseases cause gastrointestinal disease symptoms, food is an important vehicle of transmission for many gastrointestinal pathogens that cause a substantial public health burden (WHO, 2015). Transmission of these pathogens can also occur through non-foodborne routes including, for example, through close contact with infected people, contact with an infected animal or its environment or recreational exposure to contaminated water during activities such as swimming in lakes or rivers. Foodborne infections acquired while travelling outside the UK also contribute to the overall totals.

It is also important to note when assessing trends in gastrointestinal pathogen reporting generally that no disease surveillance system is expected to be fully complete and consequently both surveillance biases and under-ascertainment of infectious gastrointestinal disease are anticipated. Laboratory confirmed cases as presented in this section 5.2.3 represent only a fraction of overall foodborne gastrointestinal illness.

Headline evidence

Figure 5.2.3a: Number of laboratory-confirmed reported infections in the United Kingdom, 2019 to 2023

Source: UK Health Security Agency, Public Health Wales, Public Health Scotland and Public Health Agency Northern Ireland reporting systems (Second Generation Surveillance system [SGSS], Electronic Communication of Surveillance in Scotland, [ECOSS]). This data is derived from live reporting systems and is subject to change.

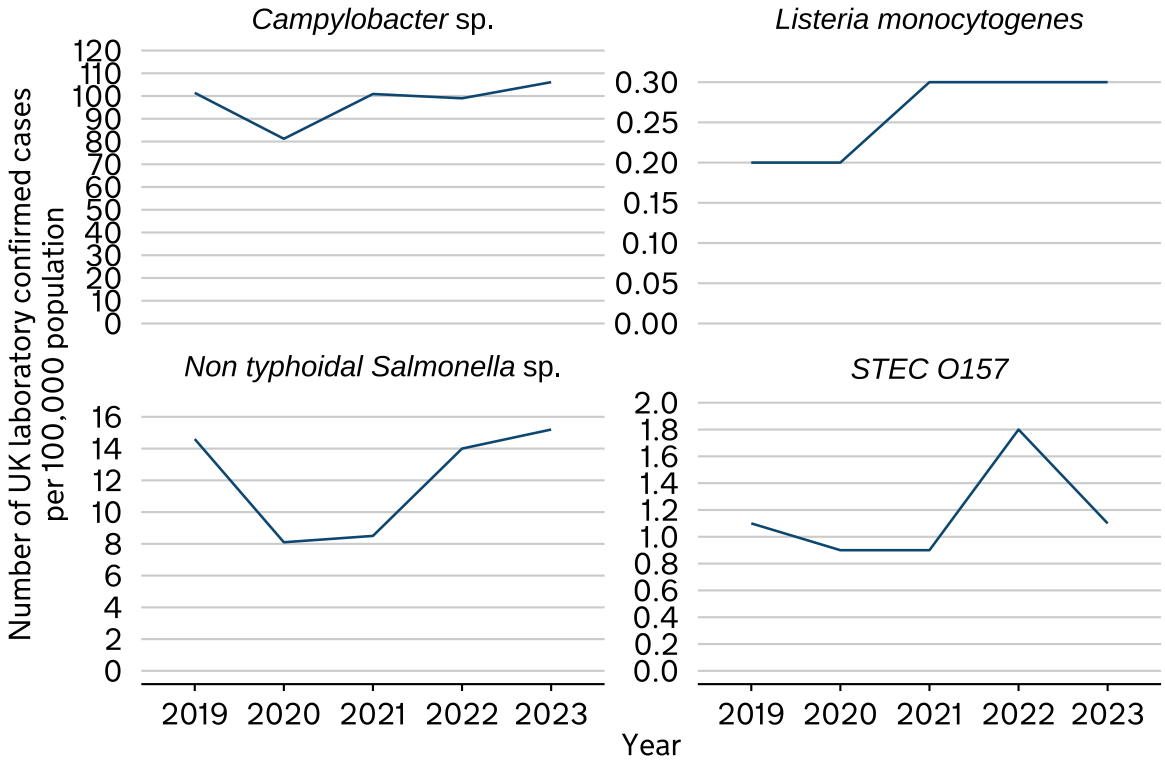
Year	*Campylobacter* spp.	Non-typhoidal *Salmonella* spp.	STEC O157	*Listeria monocytogenes*
2019	67,750	9,725	722	156
2020	54,441	5,428	572	144
2021	67,546	5,719	569	184
2022	66,327	9,393	1,201	200
2023	71,710	10,257	762	203

Note:

1. These four pathogens are considered priority pathogens for national surveillance of foodborne infections due to the associated burden of disease and the substantial implications for public health and food safety in the UK.
2. Data include serum positive cases and cases that were polymerase chain reaction (PCR) test positive but bacterial culture test negative (pcr+/culture neg). Data for 2023 are provisional.

Figure 5.2.3b: Reported *Campylobacter* spp., non-typhoidal *Salmonella* spp., STEC O157 and *Listeria monocytogenes* infections per 100,000 population per year in the United Kingdom, 2019 to 2023

Source: UK Health Security Agency, Public Health Wales, Public Health Scotland and Public Health Agency Northern Ireland reporting systems (Second Generation Surveillance system [SGSS], Electronic Communication of Surveillance in Scotland, ECOSS)



Note: This data is derived from live reporting systems and is subject to change. The rates per 100,000 population stated (y axis) are calculated using ONS mid-year population estimates (2022 estimates were used for 2023 as 2023 estimates not yet available).

The bacterial pathogen with the highest number of reported cases annually across all years from 2019 to 2023 was *Campylobacter* spp, with the highest reporting rate in 2023 in this reporting period. Non-typhoidal *Salmonella* spp. was the second most commonly reported pathogen each year from 2019 to 2023.

The number of laboratory confirmed reports and the observed reporting rate per 100,000 population for STEC O157 in 2022 was higher than for any year in the last decade. The increase in 2022 was mostly attributable to two large national outbreaks (one foodborne and one driven by person-to-person transmission). For *L. monocytogenes,* more cases were reported in 2022 and 2023 compared to previous years, but the reporting rate was generally consistent between 2021 to 2023. The small numbers of *L. monocytogenes* cases reported annually limits

meaningful trend analysis and interannual variation should be interpreted with caution.

Supporting evidence

Reports of other STEC serogroups (called non-O157 STEC), in particular STEC O26 and O145, have been increasing over the last decade (data not shown). Changes in testing with frontline laboratories implementing enhanced testing methods for non-O157 STEC may account for some of this increase, however, it is likely that there has also been a genuine increase in non-O157 STEC case incidence compared to previous years. UK public health agencies are working to assess this trend and understand the drivers in more detail.

The COVID-19 pandemic had variable impacts on the reporting of case numbers of these four bacterial pathogens between 2020 to 2022, although the magnitude and duration of this impact varied by pathogen. For all four pathogens the number of reported cases and the reporting rate dropped during 2020. Reported cases of *Campylobacter* spp. returned to levels consistent with the pre-pandemic period in 2021. Reports of *L. monocytogenes* also returned to levels consistent with the pre-pandemic period in 2021. *Salmonella* spp. reports took longer to return to pre-pandemic levels, only doing so by 2023, with the reporting rate observed in 2023 being the highest since 2018.

Caution is advised when interpreting long term trends that span the COVID-19 pandemic years. The drivers of the drop in gastrointestinal pathogen reporting observed during the pandemic are considered to be multifactorial, vary by pathogen and linked to many different societal and behavioral changes that occurred during that time. This includes the impact of non-pharmaceutical interventions implemented to control COVID-19, with all these changes collectively impacting the transmission of gastrointestinal pathogens and the ascertainment of laboratory confirmed cases by national surveillance systems.

5.2.4 Foodborne disease outbreak surveillance

Rationale

An ‘outbreak’ is defined as two or more human cases of the same disease, linked to the same source. Specifically for foodborne outbreaks, the definition usually applied is ‘an incidence, observed under given circumstances, of two or more human cases of the same disease and/or infection, or a situation in which the observed number of human cases exceeds the expected number and where the cases are linked, or are probably linked, to the same food source (including potable water)’ (Directive 2003/99/EC).

The collation of national level foodborne outbreak surveillance data started in the UK in 1992 and this data provides an important source of information for foodborne and infectious gastrointestinal disease trend analysis. The data is used, alongside other surveillance indicators for foodborne gastrointestinal pathogens, to inform risk assessment and policy development for the protection of UK consumers against risks posed by foodborne disease.

Not all outbreaks of gastrointestinal disease with a suspected food source are microbiologically linked to an implicated food vehicle, as specific food vehicles are not always identified or available for microbiological testing. Around a third of all outbreaks investigated do not result in the identification of a suspected or implicated food vehicle and this has been generally consistent with the long-term trends observed in the UK. It should also be noted that there are limitations in national foodborne outbreak surveillance data. National surveillance systems rely on reporting of outbreaks detected and investigated each year at the local, regional and national level. This reporting will not always be fully complete or comprehensive and ascertainment at the individual case and outbreak level is therefore incomplete with the potential for bias.

The UK Health Security (UKHSA), Public Health Wales (PHW), Public Health Scotland (PHS), and the Public Health Agency Northen Ireland (PHA) are the lead organisations responsible for the detection, investigation and management of outbreaks of foodborne disease in the UK, working in partnership with food safety, animal health and local authority professionals to implement public health protection and food safety controls.

Headline evidence

Figure 5.2.4a: Number of foodborne outbreaks by causative agent investigated and reported to national public health surveillance in the UK 2019 to 2023

Source: UK Health Security Agency, Public Health Wales, Public Health Scotland and Public Health Agency Northern Ireland reporting systems (Electronic Foodborne and non-foodborne outbreak surveillance system, eFOSS, in England and Wales, and the outbreak surveillance datasets in Northern Ireland and Scotland).

Causative Agent	2019	2020	2021	2022	2023	Grand Total
Salmonella spp.	15	7	9	11	8	50
Enteric viruses	16	2	4	6	16	44
STEC & Other DEC	6	7	3	6	14	36
Listeria monocytogenes	3	3	6	6	8	26
Clostridium perfringens	7	4	4	8	3	26
Campylobacter spp.	3	4	7	1	4	19
Unknown*	6	2	N/A	N/A	4	12
Shigella spp.	N/A	N/A	1	2	2	5
Cryptosporidium spp.	N/A	N/A	1	N/A	1	2
Other**	1	1	N/A	N/A	N/A	2
Grand Total	**57**	**30**	**35**	**40**	**60**	**222**

Note:

* ‘Unknown’ are outbreaks where a causative agent was not identified as the cause of the disease in the outbreak associated human disease cases

** ’Other’ includes marine biotoxins such as scombrotoxin and okadaic acid as well as other entero-toxin producing bacteria such as *Staphylococcus* or *Bacillus* spp.

N/A = none reported and / or not known

Figure 5.2.4b: Total number of associated human cases and percentage hospitalised (*X%*)* associated with foodborne outbreaks reported to national public health surveillance by causative agent in UK, 2019 to 2023

Source: UK Health Security Agency, Public Health Wales, Public Health Scotland and Public Health Agency Northern Ireland reporting systems (Electronic Foodborne and non-foodborne outbreak surveillance system, eFOSS, in England and Wales, and the outbreak surveillance datasets in Northern Ireland and Scotland).

Causative agent	2019	2020	2021	2022	2023	Total
Salmonella spp.	**549** *(7%)*	**732** *(7%)*	**986** *(5%)*	**591** *(14%)*	**522** *(4%)*	**3380** *(7%)*
Enteric viruses**	**476** *(1%)*	**180** *(0%)*	**407** *(0%)*	**261** *(1%)*	**522** (0%)	**1846** *(2%)*
Campylobacter spp.	**39** *(0%)*	**28** *(4%)*	**80** *(11%)*	**13** *(0%)*	**16** *(0%)*	**176** *(6%)*
Clostridium perfringens	**141** *(0%)*	**90** *(8%)*	**109** *(0%)*	**210** *(0%)*	**43** *(2%)*	**593** *(1%)*
STEC & Other *DEC*	**65** *(40%)*	**93** *(32%)*	**52** *(35%)*	**348** *(27%)*	**265** *(41%)*	**823** *(33%)*
Listeria monocytogenes	**17** *(100%)*	**9** *(100%)*	**16** *(100 %)*	**19** *(100 %)*	**23** *(91%)*	**84** *(98%)*
Shigella spp.	N/A	N/A	**19** *(11%)*	**26** *(19%)*	**57** *(16%)*	**102** *(16%)*
Cryptosporidium spp.	N/A	N/A	**3** *(0%)*	N/A	**14** *(0%)*	**17** *(0%)*
Other***	**13** *(0%)*	**3** *(0%)*	N/A	N/A	N/A	**16** *(0%)*
Unknown****	**140** *(0%)*	**13** *(0%)*	N/A	N/A	**38** *(13%)*	**191** *(3%)*

Causative agent	2019	2020	2021	2022	2023	Total
Total	**1,440** (6%)	**1,148** (9%)	**1,672** (6%)	**1,468** (14%)	**1,500** (11%)	**7,228** (9%)

Note:

*Hospitalisation data not known for all cases; ascertainment of both cases and hospitalisation varies according to the pathogen, clinical severity and differences in laboratory testing.

**Includes foodborne norovirus outbreaks or norovirus outbreaks related to infected food handlers.

***'Other' includes marine biotoxins such as scombrotoxin and okadaic acid as well as other entero-toxin producing bacteria such as *Staphylococcus* or *Bacillus* spp.

****'Unknown' are outbreaks where a causative agent was not identified as the cause of the disease in the outbreak associated human disease cases.

N/A = none reported and / or not known

In total, the UK public health agencies, together with partner organisations, investigated and reported 222 foodborne disease outbreaks during 2019 to 2023. A causative agent was identified in 210 (95%) of these outbreak investigations. Non-typhoidal *Salmonella* spp. was the most frequently reported causative agent (50 out of 222 outbreaks in total, 22%), with enteric viruses (predominantly norovirus) second (44 outbreaks, 20%), followed by STEC & other diarrhoeagenic *E. coli* (DEC) (36 outbreaks, 16%). The highest number of *Listeria monocytogenes* outbreaks investigated annually in this 5-year period was in 2023 with 8 outbreaks reported.

There were 7228 cases of foodborne illness associated with the total 222 outbreaks investigated and reported during 2019 to 2023. The majority of cases were associated with non-typhoidal *Salmonella* spp. outbreaks (3380 cases, 47%) and enteric viruses (1846 cases, 26%).

The high number of outbreak associated cases of STEC in 2022 was mostly attributable to one large national foodborne outbreak of STEC O157. The total number of STEC/other DEC outbreaks and associated cases was notably higher in 2023 compared to previous years. The reasons for this increase are likely multifactorial, including improved ascertainment due to the wider adoption of tests

at frontline diagnostic laboratories able to detect STEC serogroups other than O157 alongside a likely genuine increase in non-O157 case incidence.

While just under 10% of the total associated outbreak cases between 2019 and 2023 reported hospitalisation, this varied substantially by pathogen and for some pathogens, by strain.

Overall the 2019 to 2023 foodborne outbreak surveillance data demonstrates proportional trends in causative agents, hospitalisation rates and associated foods implicated in the investigations that are relatively consistent with trends observed in the last decade, with the exception of STEC/other DEC in 2022 and 2023.

Supporting evidence

Despite *Campylobacter* spp. being the most commonly reported bacterial pathogen in the UK based on laboratory confirmed case reports, the number of reported outbreaks investigated between 2019 to 2023 was less than half the number of *Salmonella* spp. associated outbreaks. *Campylobacter* spp. outbreaks are more difficult to detect than other bacterial pathogens due to the lack of a routinely implemented national typing scheme at present (i.e. routine whole genome sequencing).

In 2021, 2022 and 2023, several long duration *Listeria monocytogenes* outbreaks were investigated either over multiple years or were investigated as re-emergence of outbreak strains spanning multiple years which impacted on the overall number of outbreaks reported.

The total number of reported outbreaks in 2023 (60 outbreaks) was notably higher than the number reported during the COVID-19 pandemic (30 outbreaks and 35 outbreaks in 2020 and 2021 respectively), but similar to the number reported in 2019. However, the number of cases associated with the reported outbreaks in each year, ranging from 1,440 associated cases (2019) to 1,672 (2021) remained relatively consistent over the 5-year period of 2019 to 2023.

Hospitalisation

Severity of disease varies considerably by pathogen. Despite a lower number of associated outbreak cases overall compared to *Salmonella* spp. and enteric virus outbreaks, the greatest number of hospitalised cases over the 5-year period were associated with STEC/other DEC outbreaks (275 cases, 33% of all reported hospitalisations). The percentage of outbreak associated cases reporting hospitalisation was higher in 2023 than any other year in the last decade.

Reported hospitalisations among cases associated with *Listeria monocytogenes* outbreaks varied between 91% and 100% across the 5 years of 2019 to 2023. It should be noted that enhanced surveillance of STEC/other DEC and *Listeria*

monocytogenes is likely to result in better ascertainment of hospitalisation rates compared to the other pathogens for which there is no national enhanced surveillance system in place.

Foodborne outbreaks by food vehicle

Figure 5.2.4c: Foodborne outbreaks by food vehicle investigated and reported to national public health surveillance per year, 2019 to 2023 in the UK*

Source: UK Health Security Agency, Public Health Wales, Public Health Scotland and Public Health Agency Northern Ireland reporting systems (Electronic Foodborne and non-foodborne outbreak surveillance system, eFOSS, in England and Wales, and the outbreak surveillance datasets in Northern Ireland and Scotland

Food vehicle	2019	2020	2021	2022	2023	Total
Poultry meat and poultry meat products	4	4	4	5	5	22
Composite or mixed foods	11	0	4	5	5	25
Other mixed meat/poultry/products	2	1	0	2	1	6
Eggs and egg products	6	1	1	0	1	9
Beef/bovine meat and products	2	2	4	5	6	19
Crustaceans/shellfish/molluscs	3	3	2	1	8	17
Fruits and vegetables	0	3	4	2	4	13
Dairy	1	4	2	5	4	16
Pork meat and products	2	0	2	1	2	7
Lamb meat and products	2	0	1	1	1	5
Finfish and products	0	1	1	1	1	4
Herbs/spices/cereal products/nuts and seeds	1	1	0	1	1	4
Unknown*	23	10	10	11	21	75
Total	**57**	**30**	**35**	**40**	**60**	**222**

Note: Not all outbreaks are microbiologically linked to the implicated food vehicle.

* Epidemiological investigations may not always be able to identify the food causing the outbreak, and food sampling may not always be undertaken. For those outbreaks where a food vehicle could not be identified, these outbreaks are reported as ‘unknown food vehicle’.

Figure 5.2.4d: Foodborne outbreaks by food vehicle investigated and causative agent reported to national public health surveillance, 2019 to 2023 in the UK

Source: UK Health Security Agency, Public Health Wales, Public Health Scotland and Public Health Agency Northern Ireland reporting systems (Electronic Foodborne and non-foodborne outbreak surveillance system, eFOSS, in England and Wales, and the outbreak surveillance datasets in Northern Ireland and Scotland).

Food Vehicle Category	*Clostridium perfringens*	*Listeria monocytogenes*	*Campylobacter* spp.	*Cryptosporidium* spp.	Enteric viruses	*Salmonella* spp.	STEC & Other DEC	*Shigella* spp.	Other	Unknown	Total
Beef / bovine meat and products	5	8			1	1	4				19
Composite & mixed foods	7		3		9	2	2	1		1	25
Dairy products	1	2	3	2		2	6				16
Fruits & vegetables			1			3	8	1			13
Poultry meat and poultry meat products	2	4	6			10					22
Pork meat & products	3				1	2				1	7
Crustaceans / shellfish / molluscs	1	1			12				1	2	17
Herbs / spices / cereal products / nuts & seeds						4					4

Food Vehicle Category	*Clostridium perfringens*	*Listeria monocytogenes*	*Campylobacter* spp.	*Cryptosporidium* spp.	Enteric viruses	*Salmonella* spp.	STEC & Other DEC	*Shigella* spp.	Other	Unknown	Total
Other mixed meat / poultry products	3					2				1	6
Eggs and egg products					1	8					9
Lamb meat & products	2		1			2					5
Finfish / fish products		4									4
Unknown	2	7	5		20	14	16	3	1	7	75
Total	**26**	**26**	**19**	**2**	**44**	**50**	**36**	**5**	**2**	**12**	**222**

There were 147 outbreaks investigated between 2019 and 2023 with a food vehicle reported as implicated or suspected to be implicated. Of these investigated outbreaks composite/mixed foods (25 outbreaks, 17%) were most commonly reported as vehicles of infection, followed by poultry meat and poultry meat products (22 outbreaks, 15 %) and beef/bovine meat and products (19 outbreaks, 13%).

Non-typhoidal *Salmonella* spp. was the most commonly reported causative agent in outbreaks associated with poultry and poultry meat products (10/22 outbreaks, 45%), egg and egg products (8/9 outbreaks, 89%) and herbs/spices/cereals/nuts & seeds associated outbreaks (4/4 outbreaks, 100%). There were several large *Salmonella* spp. outbreaks investigated in the UK, with over 1000 human cases of salmonellosis linked to imported poultry meat products. While only a small number of pork and pork product associated outbreaks were reported, the largest outbreak by number of human cases was an outbreak of *Salmonella* spp. linked to a pork snack product disseminated widely across the UK.

Campylobacter spp. was also commonly reported in outbreaks associated with poultry and poultry meat products (6/22 outbreaks, 27%). For outbreaks

associated with crustaceans/shellfish/molluscs, norovirus was the most commonly reported or suspected causative agent (14/17 outbreaks, 80%). STEC/other DEC was the most commonly reported causative agent in outbreaks associated with fruit and/or vegetable vehicles (8/13 outbreaks, 62%). STEC/other DEC was also most commonly reported as the causative agent in outbreaks linked to dairy products (6/16, 38%). Only two foodborne outbreaks of *Cryptosporidium* spp. were reported in this time period, both associated with dairy products (milk sold directly from farm settings).

Setting

Figure 5.2.4e: Percentage of foodborne outbreaks reported by setting, 2019 to 2023*

Source: UK Health Security Agency, Public Health Wales, Public Health Scotland and Public Health Agency Northern Ireland reporting systems (Electronic Foodborne and non-foodborne outbreak surveillance system, eFOSS, in England and Wales, the outbreak surveillance datasets in Northern Ireland and Scotland).

Setting	Total outbreaks
Restaurant/café/pub/bar/hotel/catering service	97
Multiple places of exposure	92
Institutional/Residential	14
Farm	9
Other Foodborne Setting	7
Take-away/fast food outlet	2
Retailer	1
Total	**222**

Note: * ‘Multiple places of exposure’ refers to national outbreaks where nationally distributed food vehicle has been consumed in more than one setting. ‘Other foodborne settings’ include settings with less than three outbreaks reported, including hospital or medical settings, workplace canteens, or other undisclosed settings.

Of all reported outbreaks, 45% were associated with catering settings (restaurants/food service establishments, takeaways or fast-food outlets), contributing 35% of the total associated human disease cases. In the largest reported outbreaks (41% of the total number of reported outbreaks but constituting 58% of the overall number of reported outbreak associated cases), the setting was designated as multiple places of exposure, i.e. when a contaminated food product that caused the outbreak is consumed in the home or at multiple locations, including in institutions and multiple different food service establishments.

Outbreaks associated with farm settings were exclusively outbreaks associated with milk sold directly from farms.

There was a notable reduction in the proportion of outbreaks associated with the food service sector during the COVID-19 pandemic years. The reasons for this are likely multi-factorial. But specifically regarding variation in outbreak settings, this is likely due to factors such as the restrictions on social mixing and diversion of public health resource to management of the pandemic, leading to reduced outbreak investigation capability for small, geographically restricted outbreaks associated with specific catering establishments.

5.2.5 Food crime

Rationale

The National Food Crime Unit (NFCU) and Scottish Food Crime and Incidents Unit (SFCIU) define food crime as serious fraud and related criminality in food supply chains. This definition also includes activity impacting on drink and animal feed. Fraudulent and criminal activity in the food chain can be damaging to food security as it reduces the agency of consumers and potentially access to safe food. It can also cause serious harm to consumers, food businesses and the wider food industry.

Loss of public trust resulting from food crime can have major economic consequences. For example, the 2012 horsemeat incident is estimated to have cost the UK industry approximately £850 million. Furthermore, FSA-commissioned research suggested that the total cost of food crime in the UK could be as much as £1.96 billion per year.

An effective food crime response increases food security in the UK by ensuring that food is safe and authentic. The response normally consists of multiple strands of intervention, across several lines of defence, to prevent, disrupt and deter criminal activity within the food supply chain. It is the responsibility of food businesses to ensure their food is safe and what it says it is. The second is the network of local authorities across the four nations that enforce food safety and standards.

The SFCIU and the NFCU act as the third line of defence through their investigation and prevention of serious food crime in Scotland, England, Wales and Northern Ireland. The crime units also support local authorities and industry in responding to the food crime threat. Case study 4 outlines the new initiatives, developed by FSS and the FSA, to strengthen these lines of defence across the UK's food chain.

The headline evidence looks at areas of focus for disruptions carried out by food crime units. While disruption figures can be used as a measure of impact against food crime, they cannot be used to draw cause-effect relationships regarding the levels of food crime. Additionally, it is hard to draw conclusive comparisons for different years, as many variables can affect disruption recording.

Headline evidence

Figure 5.2.5a: The key areas of focus for disruptions carried out by food crime units in 2021/22-2023/24

	Financial Year			
	2020/21*	2021/22*	2022/23	2023/24
Number of disruptions	190 [46]	74	109	92

Key Area of Focus	2021/22*	2022/23	2023/24
Meat and meat products	12	26	42
Dangerous non-foods sold as food	39	53	31
Diversion of animal by-products	4	12	1
Alcohol	1	1	1
Fish and seafood	1	2	1
Other	17	15	16
Total:	**74**	**109**	**92**

Note:

*does not include FSS data

[ ] shows the updated number of disruptions which would have met the revised stricter criteria. The remaining 144 would have been classified as ‘NFCU Outcomes

The above table (Figure 5.2.5a) demonstrates the number of activities that achieved evidenced impact against the food crime threat. A combined total of 92 disruptions were achieved in 2023/24, with a large proportion involving actions against criminal activity in the meat sector and relating to dangerous non-food sold as food. Meat and meat products were prominent themes in disruption recording in

2023/24. Disruption of the illegal ‘smokie’ trade was the key driver of disruption levels in this theme (detailed in Case Study 5).

Figure 5.2.5a also shows a drop in dangerous non-food disruptions, compared to the previous year. The crime units’ tentative assessment is that this was as a consequence of continued web scanning for 2,4-Dinitrophenol (DNP), a highly toxic substance often marketed as a fat burner, and positive operational activity leading to fewer DNP sellers advertising on the open web, resulting in fewer listings to disrupt.

Supporting evidence

Since publication of the 2021 UKFSR, the NFCU and SFCIU have published the UK Food Crime Strategic Assessment 2024 (FCSA). The FCSA assesses the threat facing the UK from criminals who seek to profit from serious fraud within the food chain. It also highlights food crime trends, how the units’ understanding of food crime threats have changed and at possible future threats to the food landscape.

The FCSA found that the majority of food is safe and authentic, but factors such as recent geopolitical events have caused disruptions in the food chain. These in turn have contributed to a change in the threat from food crime. As the UK’s food supply has experienced disruption, new opportunities for criminal diversification have emerged.

The NFCU and SFCIU have also taken steps to refine their measurements of food crime interventions which reduce or remove the opportunity for offending. The NFCU increased the stringency of their disruption recording criteria, contributing to wider understanding of serious organised crime threats among law enforcement partners. This meant that disruptions were required to demonstrate a higher level of recorded impact than had been applied in 2020/21. SFCIU have recorded disruptions from 2022 in-line with definitions set out in the national framework.

Case Study 4: Strengthening the lines of defence against food crime

SFCIU Food Crime Risk Profiling Tool

As part of SFCIU’s long-term strategy focus on food crime prevention, and with awareness of ongoing food industry challenges, the FSS online Food Crime Risk Profiling Tool was launched in August 2023. The profiling tool supports all Food Business Operators (FBO) in understanding their risk from food crime and the measures they can take to reduce this risk. The profile went through phased

development stages from its initial concept in 2022, with involvement from industry experts and businesses peers reviewing the aims, approach and guidance.

Through promotion, supported by partners, the tool has attracted businesses both in Scotland and globally. SFCIU will continue to develop the tool's functionality and guidance based on continued feedback from industry and food experts. The tool also enhances SFCIU understanding of risk in the supply chain and where to direct resources to support food businesses in preventing food crime in the long-term.

FSA Food Fraud Industry Working Group

Widespread media coverage around an NFCU investigation into suspected meat fraud in spring 2023 resulted in increased interest in how regulators and industry tackle food crime. In response, the FSA created a working group with industry partners to explore improved data sharing with Third Party Assurance schemes, the provision and visibility of reporting routes for people such as whistleblowers and to explore improvements for intelligence-based alerts from NFCU.

The working group activity resulted in:

- A new freephone number for the NFCU's Food Crime confidential hotline.
- Positive developments around intelligence exchange with Third Party Assurance schemes.
- Improvements to NFCU processes for issuing alerts.

The group output made it easier for consumers and those involved in the food industry to report food crime. Enhancing intelligence flows ensures authorities can act earlier and more confidently against food crime threats.

NFCU Business Guidance

In November 2023, the NFCU Unit refreshed its guidance for businesses, which aims to enhance businesses' ability to spot, report and prevent food crime. This refresh – one of several strands to support businesses – included new content for small businesses.

Case Study 5: Disrupting the smokie trade

Recent activity by food crime units targeting the smokie trade, alongside local authorities, the charitable sector and the police, exemplifies effective disruption.

A smokie is a product that involves blow-torching sheep or goat carcasses with the skin left on. This practice carries substantial risk to public health and is illegal in

the UK. Disrupting this illicit trade supports the UK's ability to ensure food is safe and protect public health. In Scotland, a joint operation involving the SFICU, the Scottish Society for Prevention of Cruelty to Animals (SSPCA) and Police Scotland resulted in a conviction for animal cruelty in relation to the production of smokies.

In England, the NFCU supported a local authority with a case that resulted in fines totalling £36,642 for three defendants operating an illegal smokie business. Four suspects also have been charged with conspiring with others to supply unsafe meat (smokies), money laundering and animal welfare offences. One suspect pleaded guilty and was sentenced in October 2024. Three further suspects await trial in 2026. The NFCU also co-ordinated activity with local authorities which resulted in 16 disruptions, including the removal of illegal smokie meat from the food chain.

Sub-theme 3: Food safety/hygiene and regulation

5.3.1 Food business compliance with food hygiene regulation

Rationale

All food businesses have a legal requirement to ensure the food they place on the market is safe. Compliance with regulatory standards ensures that hazards have been controlled and that good hygiene practice has been followed at all stages in the production process. Local authorities are responsible for enforcing compliance with food law for the vast majority of food businesses. The FSA and FSS have statutory duties to monitor and report on their performance in doing so.

This indicator tracks compliance data from Food Hygiene Rating Scheme (FHRS) in England, Wales, and Northern Ireland under which food businesses are issued hygiene ratings between 0 and 5. It is a legal requirement for food businesses in Wales and Northern Ireland to display their food hygiene rating sticker in a prominent place. Additionally this indicator looks at the percentage of businesses achieving a 'Pass' in the Food Hygiene Information Scheme (FHIS), which covers food businesses in Scotland, is based on a pass or fail rating.

Although compliance with food hygiene regulation does not eliminate the risk of outbreaks or unsatisfactory samples results, analysis indicates that premises with higher FHRS ratings are less likely to have unsatisfactory results or encounter outbreaks. Poor hygiene can have an adverse impact on public health, with the FSA's Cost of Illness model estimating the total burden of foodborne illness for the UK to be approximately £10.4 billion annually.

Both the FHRS and FHIS draw on the most recent inspections carried out by local authorities and are given to businesses involved in serving and preparing food, including restaurants, pubs, cafés, takeaway outlets and canteens, as well as other places where food is supplied, sold, or consumed, such as hospitals, schools and care homes. In Wales, the scheme also covers business-to-business operations such as manufacturers that fall under the remit of local authorities. It should be noted that FHIS is not directly comparable with the rest of the UK due to the different approach in ratings as outlined earlier.

Despite FHRS being introduced in 2010, the scheme had a phased introduction between 2014 and 2019. Given this phased introduction, FHRS data from 2019 has been used a proxy for the number or level of establishments subject to a food hygiene intervention.

In Scotland, FSS monitors the performance of food businesses under FHIS alongside the results of local authority inspections undertaken through the Food Law Rating System (FLRS). FLRS was introduced in Scotland in 2019 to amalgamate the risk rating systems for food hygiene and food standards into a single Food Law Intervention. It provides a framework for local authorities to target their enforcement activities based on risk; enabling them to assess businesses on their overall legal compliance with both the food hygiene and food standards aspects of food law. FLRS data can now be used alongside FHIS ratings (which only cover food hygiene) to provide a more comprehensive picture of food business compliance in Scotland. As FLRS was implemented in a phased approach, 2022 was the first year that a sufficiently representative number of inspections had been undertaken to enable monitoring.

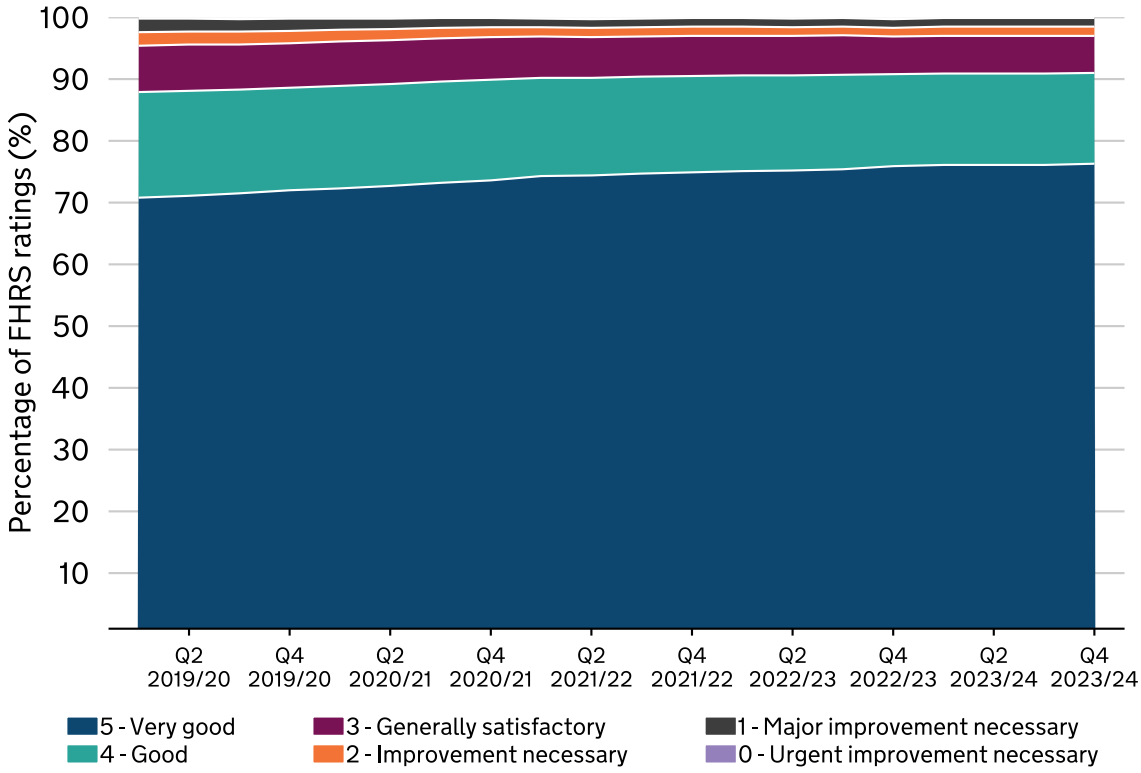
Food business hygiene compliance data in this indicator does not include all food businesses and shows only ratings from the most recent inspections (as at March 2024). Since hygiene ratings can only ever reflect data taken from the last time each establishment was inspected, having an accurate picture depends upon enough inspections being carried out to reveal any major changes, with more analysis on inspection volumes included below.

Some food businesses fall outside the scope of the schemes, and some new businesses may have not yet been rated. Inspection frequency is determined by the risk a food business poses to the public. Those with lower risk may only be inspected every three years.

Headline evidence

England, Wales and Northern Ireland

Figure 5.3.1a: Percentage distribution of FHRS ratings in England, Wales and Northern Ireland 2019/20 – 2023/24



Note: For example, in Q4 2023/24 91% of the most recent FHRS scores for FBOs were a 4 (good) or higher.

In England, Wales, and Northern Ireland (Figure 5.3.1a), there has been a slight increase in the percentage of food businesses that achieved a rating of '3 - generally satisfactory' or better under the Food Hygiene Rating Scheme (FHRS). This figure has remained stable at approximately 96.9% from Q4 2020/21 onwards. There is not a legally mandated minimum rating that businesses must achieve to operate, but a rating of 3 or above is generally considered acceptable.

Analysis of the overall distribution of ratings indicates an upward trend in food business hygiene compliance in England, Wales, and Northern Ireland between April 2019 and March 2024 (Figure 5.3.1a).

The percentage of food businesses achieving the highest '5 - very good' FHRS rating rose from 70.8% in Q1 2019/20 to 76.3% in Q4 2023/24 (Figure 5.3.1a). There was a corresponding decrease in the proportion of businesses with ratings of '4 - good', '3 - generally satisfactory', '2 - improvement Necessary', and '1 -

major improvement necessary'. The percentage of food businesses with a '0 - urgent improvement necessary' rating has remained relatively stable at approximately 0.2% (Figure 5.3.1a).

Scotland

Figure 5.3.1b: Percentage of food businesses in Scotland compliant with food law risk rating schemes 2022-23

Percentage of food businesses in Scotland compliant with food law risk rating schemes 2022-23	2022	2023
	97.0%	98.4%

In Scotland, the percentage of businesses achieving a 'Pass' rating in the Food Hygiene Information Scheme (FHIS) has remained at over 90% since 2019/20. In the first two years of the combined food hygiene and food standards inspection regime FLRS being introduced, there was a modest increase of 2.4 percentage points in the proportion of food businesses compliant with food law, rising to 98.4% from 97% in 2022 (Figure 5.3.1b).

Number of ratings issued

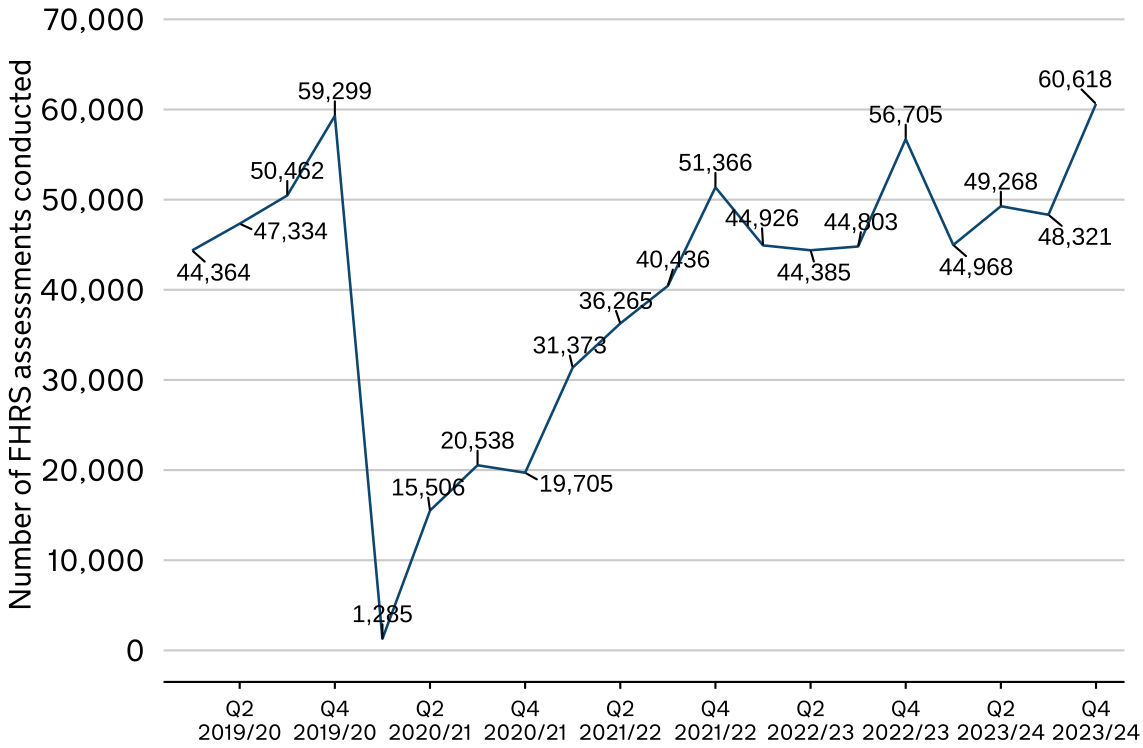
As previously mentioned, compliance ratings are based solely on the most recent inspections. The COVID-19 pandemic affected local authority officers' ability to visit food businesses to conduct inspections and issue ratings. Businesses which conduct higher risk activities were prioritised for inspections at the time. Many local authority food officers were also diverted to critical COVID-19 response roles. This disruption resulted in a substantial decrease in the number of ratings issued in 2020/21.

Despite the relative return to pre-pandemic levels in 2023/24, there is still a backlog of food businesses overdue an inspection. Since the pandemic, local authorities have been working to address the backlog at lower-risk businesses. Although local authorities are back to operating with similar staffing numbers to those immediately before the pandemic, this has not been enough to catch up on the number of overdue inspections.

Theme 3 highlighted the capacity issues that local authorities are experiencing. As the FSA and FSS report Our Food 2023 outlined, maintaining hygiene standards requires local authorities to have enough experienced and trained staff to carry out these inspections.

England, Wales and Northern Ireland

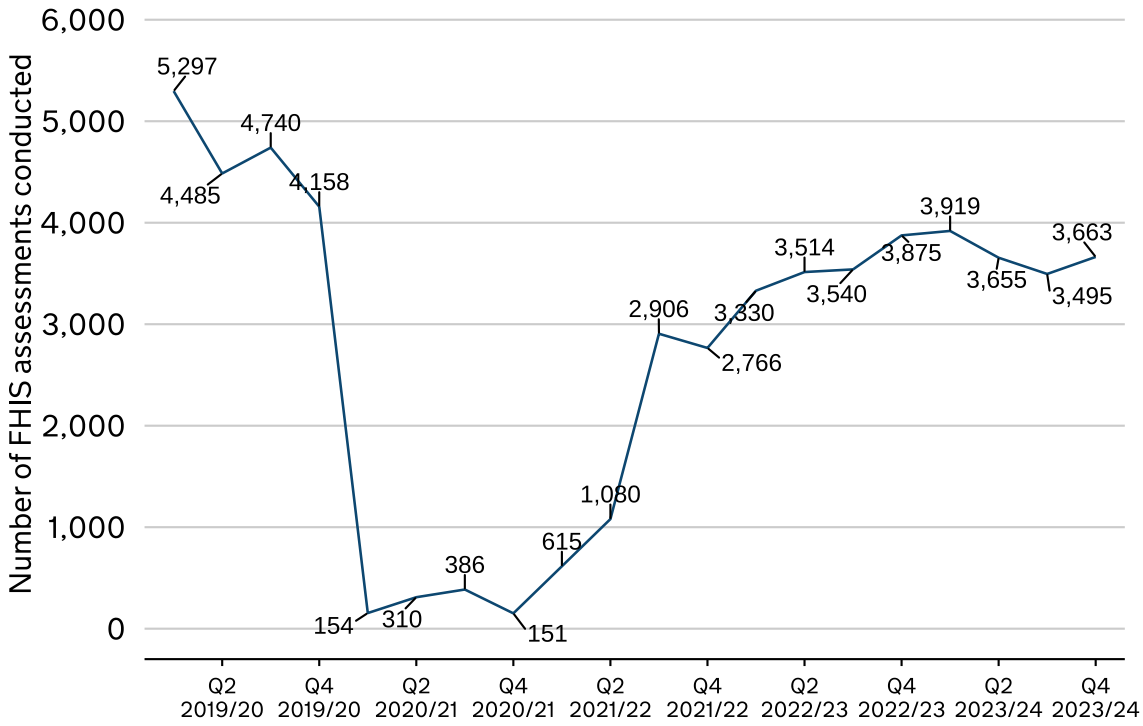
Figure 5.3.1c: Number of food businesses issued a food hygiene rating by quarter for England, Wales and Northern Ireland from 2019/20 to 2023/24



In England, Wales and Northern Ireland (Figure 5.3.1c), analysis shows the monthly average of FHRS ratings issued declined from 16,788 in 2019/20 to 4,753 in 2020/21, a decrease of 71.7%. In 2023/24, the monthly average returned to pre-pandemic levels, with an average of 16,931 ratings issued per month in England, Wales and Northern Ireland.

Scotland

Figure 5.3.1d: Number of food businesses issued a FHIS rating by quarter for Scotland between 2019/20 and 2023/24



In Scotland, the monthly average ratings issued declined from 1,557 in 2019/20 to 83 in 2020/21 (Figure 5.1.7d), a decrease of 94.6%. In 2023/24, the monthly average increased nearly to pre-pandemic figures, with an average of 1,228 ratings issued per month.

Supporting evidence

As the theme introduction outlined, adherence to food safety and standards requirements and a strong regulatory framework helps to maintain consumer confidence in the food system.

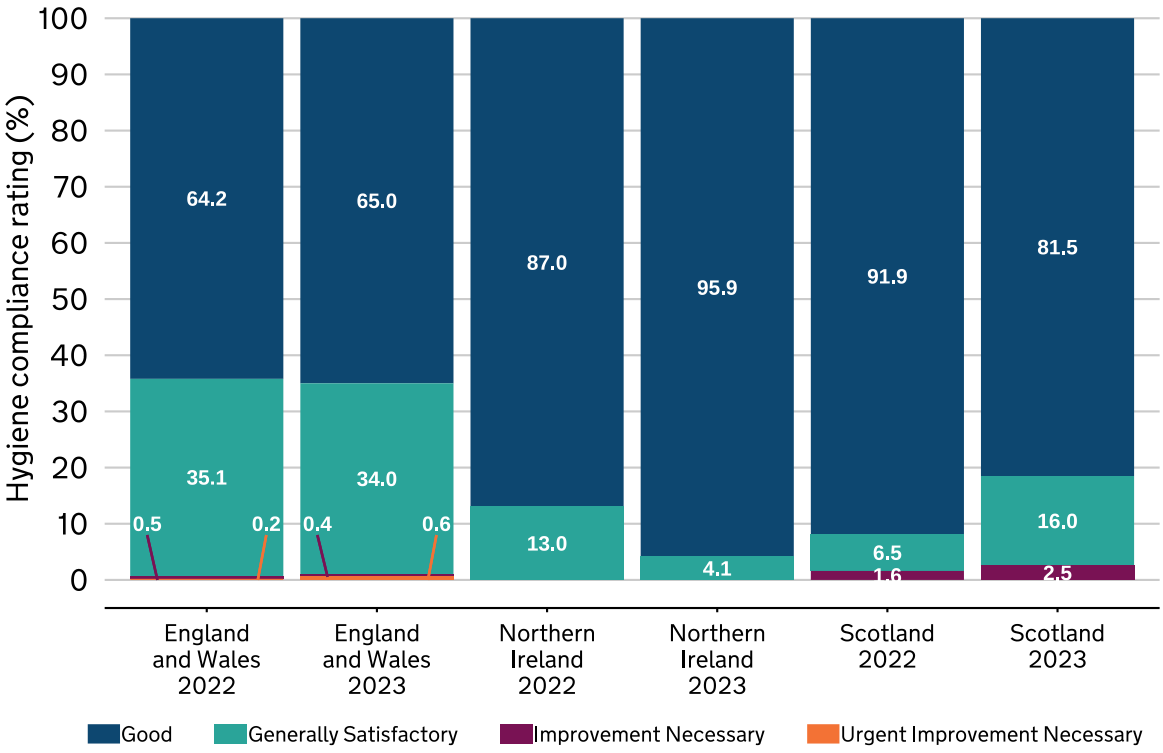
The UK Public's Interests, Needs and Concerns Around Food report, commissioned by the FSA and FSS, found the UK public clearly cared about the safety, hygiene and standards of their food. Food safety, hygiene and standards were viewed as foundational food issues that affect everyone in the UK. Many participants worried about the maintenance of food standards in the future, particularly regarding the long-term safety of substances added to food, such as hormones, pesticides, and additives. Additionally, many people were concerned about allergen management and the availability of related information.

Hygiene in approved meat establishments

As referenced in Theme 3 Indicator 3.1.3 Labour and Skills, the functioning of meat establishments across the UK, approved by FSA and FSS, is crucial for the smooth operation of the UK's food supply chain. These establishments, which include slaughterhouses, game handling establishments, cutting plants, and wholesale meat markets, are subject to risk-based audits to ensure they adhere to hygiene, animal health, and welfare standards. Meat establishment hygiene compliance data provides only a snapshot of compliance levels based on the latest available audits for meat businesses across the UK at the end of each calendar year.

In 2021, Scotland moved to a new audit system, therefore 2022 became the first full year for which comparable (year on year) data is available. Data for England and Wales, and Northern Ireland is presented from 2022 to provide a similar time series. However, as the frequency and nature of these audits vary across the UK, direct comparisons between England and Wales, Scotland and Northern Ireland cannot be made.

Figure 5.3.1e: Breakdown of hygiene compliance ratings for approved meat establishments (FSA and FSS)



In England and Wales (Figure 5.3.1g), the percentage of meat establishments rated as 'good' or 'generally satisfactory' for hygiene remained stable between 2022 and 2023, with a slight decrease of 0.3 percentage points from 99.3% in 2022 to 99.0% in 2023. This suggests that a very low number of meat

establishments (only 1 in 100) were not compliant with hygiene standards. In Northern Ireland, the percentage of meat establishments rated as ‘good’ or ‘generally satisfactory’ for hygiene was 100% in both 2022 and 2023 (Figure 5.3.1e).

The analysis of score distributions shows that the number of meat establishments in England and Wales receiving an ‘urgent improvement necessary’ rating rose from 0.2% in 2022 to 0.6% in 2023, a marginal increase of 0.4 percentage points. In such instances, suitable guidance and/or enforcement action is implemented to ensure the business returns to compliance. The specific timeframe for becoming compliant again varies depending on the severity of the non-compliance and the nature of identified issues.

The percentage of meat establishments rated as ‘good’ or ‘generally satisfactory’ for hygiene in Scotland remained stable, with a slight decrease of 0.9 percentage points from 98.4% in calendar year 2022 to 97.5% in calendar year 2023 (Figure 5.3.1e). This suggests that only a small number (1 in 40 establishments) were not compliant with hygiene standards.

The percentage of meat establishments in Scotland rated ‘improvement necessary’ remained broadly stable during the same period, with a slight increase of 0.9 percentage points from 1.6% in 2022 to 2.5% in 2023.

5.3.2 Safety of non-EU imports

Rationale

UK food security requires consumers to have access to sufficient quantities of safe food. Food imported to the UK must comply with certain requirements to protect consumers. Effective border controls should allow safety risks from imported food to be detected so that action, where required, can be taken at an early stage. This is an important step for public health protection. In the UK, the types of checks carried out depend on the type of product and the level of risk it may pose to public, animal and plant health.

Between 2021 and 2023, EU consignments arriving in Great Britain were not subject to border controls. Theme 3 Indicator 3.2.3 Import Flows sets out the new system for food safety and biosecurity controls that applies from 2024 onwards. In this theme, border compliance data for non-EU food imported to GB between 2021 and 2023 is reviewed alongside volumes of imports, which are broken down into three main categories:

- **Products of animal origin (POAO)**, which include meat, eggs, fish and dairy

- **Food not of animal origin (FNAO)**, which includes beverages, cereals, fruit and vegetables
- **Animal feed**, which includes oilcake and pet food

Border compliance data is only available for non-EU food and feed given the lack of controls for EU imports between 2021 and 2023. Non-EU food and feed also represents only a proportion of overall food and feed imported to GB (approximately 37% - see Figure 5.3.2b). Of the checks carried out in 2023, the majority of non-EU food and feed imports subject to controls were compliant. There was an increase the number of POAO consignments failing documentary and sampling checks.

The risk-based nature of checks, as outlined below, means accurate year-on-year comparisons cannot be drawn across all categories as the checks are not a representative view of all imports.

Headline evidence

Figure 5.3.2a: Percentage of import check failures for non-EU food and feed consignments to Great Britain subject to controls between 2021 and 2023

Source: IPAFFS

Check type	Consignment type	2021	2022	2023
Documentary	Meat and other animal products (POAO)	0.91%	0.91%	1.21%
	Other high-risk foods (HRFNAO)	0.54%	0.31%	0.46%
	All consignments	0.84%	0.78%	1.08%

Check type	Consignment type	2021	2022	2023
Identity	Meat and other animal products (POAO)	0.84%	0.63%	0.83%
	Other high-risk foods (HRFNAO)	1.94%	1.16%	1.27%
	All consignments	0.87%	0.65%	0.85%

Check type	Consignment type	2021	2022	2023
Physical	Meat and other animal products (POAO)	Not available*	Not available	Not available
	Other high-risk foods (HRFNAO)	4.31%	2.60%	3.11%
	All consignments	N/A	N/A	N/A

Check type	Consignment type	2021	2022	2023
Sampling (as part of a physical check)	Meat and other animal products (POAO)	0.99%	0.93%	1.33%**
	Other high-risk foods (HRFNAO)	4.78%	4.13%	3.95%
	All consignments	2.76%	2.44%	2.40%

Notes:

*Since leaving the EU and moving to the import of products, animals, food and feed system (IPAFFS), the functionality of the system records only the outcome of sampling checks undertaken and not physical checks.

**33 results pending of over 400

N/A means ‘not applicable’

From 2021 to 2023, almost all food and feed products of animal origin (POAO) from the EU to Great Britain were subject to both documentary checks (which confirm that appropriate documentation is provided) and identity checks (which confirm that the product matches the documentation). A smaller proportion of these products then underwent additional physical checks. Sampling may be carried out as part of a physical check. See the supporting evidence for total volume of imports split by main categories of POAO, FNAO (foods not of animal origin) and feed.

Most foods not of animal origin (FNAO), such as fruits and vegetables, are considered lower risk than POAO and were therefore not subject to the same checks during this period. However, where a risk was identified in a specific product from a specific country, they were added to the list of high-risk FNAO (HRFNAO) and went through additional documentary, identity and physical checks at the border.

Of the checks carried out in 2023, the majority of non-EU food and feed imports subject to controls were compliant. There was an increase the number of POAO consignments failing documentary and sampling checks.

Supporting evidence

Around 40 million tonnes of food are imported into the UK each year, of which approximately 60% comes from the EU. There has been little recent change to the top 10 countries from which the UK imports.

Figure 5.3.2b: Total volume of imports split by main categories of POAO, FNAO and animal feed

Source: HMRC Trade Database and Trade Data Visualisation Application

Import category	Total in 2023 (tonnes)	Volume change 2019*-2023	Volume change 2022-2023	EU proportion 2023 (2019)
POAO	6,561,672	-6%	-1%	79% (81%)
FNAO	28,282,742	-4%	-3%	63% (63%)
Feed	5,711,579	-13%	0%	46% (42%)
Total	40,555,993	-6%	-2%	63% (63%)

Annex I

UK Food Security Report Changes Log

Rationale

The purpose of this Annex is to summarise the consultation process for the UKFSR 2024 including the feedback received and how it was addressed. It also provides a table tracking changes to the set of indicators between the 2021 and 2024 iterations of the UKFSR to support readers with referring back to indicators in the UKFSR 2021.

Consultation process

Production of UKFSR 2024 has involved extensive consultation with stakeholders and experts. This has included workshops with government experts, a public questionnaire – which was also shared with food sector stakeholders - and an ongoing engagement with a dedicated Expert Elicitation Group of food system specialists, industry stakeholders and academics to ensure scientific scrutiny and rigour.

The UKFSR production team sought targeted views on the UKFSR 2021; specifically, whether existing indicators should be retained and enhanced, merged, or removed, while also conducting a scoping exercise for new indicators. Criteria for inclusion of new content was that data should be high quality, relevant to the subject, add value to existing content, and be published and peer reviewed where possible. The 6 dimensions of the food security definition set the parameters for considerations of relevance of data to food security (see Annex II for an explanation of the dimensions).

This consultation has driven several improvements to the UKFSR 2024 including expansions and refinement of indicators and improvements to the accessibility of UKFSR. Some proposed data was not included in UKFSR 2024, which was generally due to issues with the availability of quality data or needing to prioritise data to avoid indicators becoming too lengthy. An example of data not included was aspects of data on a local level such as household stockpiling due to absence of available public data.

Feedback Overview

Section of Report	Key Message
Overall	• **Report structure**: Make stronger links between themes to support systems understanding. • **Presentation:** Clarify definition of food security including the elements of food security covered. • **Future:** Include more forward-looking content, including how future shocks and stresses identified could interact and cascade through the food system. • **Nutrition and diet:** Take a more nuanced approach to nutrition beyond calorie intake. • **Local data**: Do more to track food security at a local level.
Theme 1: Global food availability	• **Climate and environmental risks:** Strengthen analysis on impacts of climate change and biodiversity loss over long term. • **Relevance to UK food security:** Ensure food commodities selected for analysis are relevant to the UK food system. • **Trade risks**: Look at maritime chokepoints and export bans.
Theme 2: UK food supply sources	• **Land use:** Ensure land use change analysis does more to consider types and quality of land. • **Sustainability**: Include more measures of sustainability such as use of fertiliser and antimicrobials. • **Nature**: Include more on slow onset change in nature and ecosystem services such as biodiversity and pollinators. • **Overseas sourcing and climate risks:** Consider range of risks to imports including from climate change, nature loss, and concentration in key supplier countries.
Theme 3: Food supply chain resilience	• **Approach:** Distinguish between shocks and stresses in the food system as they require different management strategies. • **Business landscape:** Look at business investment levels and risks to supply chain from consolidation of business and outsourcing manufacturing overseas. • **Trade and transportation**: Consider climate change impacts on transport systems and logistical choke points. • **Non-food inputs**: Include data on food packaging. • **Local resilience**: Include data on household stockpiling.
Theme 4: Household-level food security	• **Diet and nutrition**: Include data on nutrition and healthy diets, including on sustainability and recognition of difference between sustainable and healthy diets. • **Food insecurity**: Highlight the varied impacts on different demographics.

Section of Report	Key Message
	• **Current trends:** Cover the impact of cost-of-living challenges from the period of high inflation, the coronavirus (COVID-19) pandemic, and trends such as access to online shopping.
Theme 5: Food safety and consumer confidence	• **Sources:** Use a wider range of sources • **Surveillance sampling:** Include sources to national surveillance programmes. • **Sampling rates**: Include data on local authority sampling rates and skills shortages now in (theme 3) • **Trade:** Include border compliance data (for non-EU food imported to GB).

Overview of changes from UKFSR 2021

Structure

- Across UKFSR indicators have been reordered, enhanced, renamed, merged or removed. These changes have been tracked in the tables below, which outline the 2021 indicator number, the decided outcomes for each indicator, the new 2024 indicator number, and new indicator names where applicable.
- Some indicators have been merged and some have been disaggregated. The purpose of these changes is to aid accessibility and navigability for readers, as well as to help facilitate a logical reading order to reflect the overall food system, especially with regards to displaying linked factors together. Notably, indicators on food sources in theme 2 have been organised by food groups rather than separating into trade and production.
- New indicator groupings, called ‘sub-themes’, have been introduced (e.g. Production in theme 1), to allow for greater navigability of UKFSR.
- The structure within indicators has been changed to make it easier to identify the headline statistic (now under ‘headline evidence’) and the supporting statistics (now under ‘supporting evidence’)
- New annexes support accessibility: a glossary of technical terms; an explainer of the consultation process behind the UKFSR (Annex I); and an explainer of its intellectual framework and food security definition (Annex II).

New Content

- Following feedback, the majority of indicators from the UKFSR 2021 have been retained and enhanced.
- There are new substantive indicators across the report (see indicator changes by theme below) including indicators on diet and health, foodbank usage, productivity, biosecurity, and water dependency.
- Indicators measuring environmental change have been expanded to enhance the UKFSR's longer-term view

- Indicators have been developed to put forward a ‘multi-criteria' analysis that links the different dimensions of food security such as availability, access (e.g. affordability), utilisation (e.g. health and nutrition) and stability (e.g. price).
- Climate analysis has been integrated across sectors (crops, fruit and veg, livestock, fish, transport, water) in place of a single agriculture focused climate indicator and strengthened using UK Climate Projection (UKCP) data.
- Theme 4 Household Food security has enhanced data related to groups with protected characteristics, e.g. age, disability.

Indicator Changes by Theme

- The tables below outline the changes made to indicators since the 2021 UKFSR. As tracked below, some indicators from the 2021 report have been renamed to better reflect the data included in the 2024 report.

Theme 1: Global food availability

Indicators in 2021 UKFSR		Updated indicators and ordering for 2024 UK FSR		
2021 Indicator Number 2024 Indicator Number	Indicator name | 2024 decision	2024 Indicator Number	Indicator name | Case Study	Grouping
1.1.1 1.1.1	Global output per capita (Retained and enhanced)	1.1.1	Global food production	Production
1.1.2 1.1.3	Cereal yield growth rates by region (Retained and enhanced)	1.1.2	**NEW** Global food loss and waste	Production
1.1.3 1.3.2	Real agricultural commodity prices (Retained and enhanced)	1.1.3	Global cereals production	Production
1.1.4 1.3.1	Stock to consumption ratios (Retained and enhanced)	1.1.4	Production of global livestock products	Production
1.1.5 1.1.4	Global livestock and dairy production (Retained and enhanced)	1.1.5	**NEW** Global fruit and vegetable production	Production
1.1.6 1.1.6	Global fish stocks (Retained and enhanced)	1.1.6	Global seafood production	Production
1.1.7 1.2.2	Global land use change (Retained and enhanced)	1.2.1	Global agricultural total factor productivity	Productivity and Inputs
1.1.8 1.2.3	Phosphate rock reserves (Retained and enhanced)	1.2.2	Global land use change	Productivity and Inputs
1.1.9 1.2.4	Water withdrawn for agriculture (Retained and enhanced)	1.2.3	Global fertiliser production	Productivity and Inputs

1.2.1 1.2.1	Global agricultural labour force capacity (Retained and enhanced)	1.2.4	Water availability, usage and quality for global agriculture	Productivity and Inputs
1.2.2 1.4.1	Components of global food demand growth (Retained and enhanced)	1.3.1	Global stock to consumption ratios	Stocks, prices and trade
1.2.3 1.3.3	Share of global production internationally traded (Retained and enhanced)	1.3.2	Global real prices Case Study 1: The role of exchange rates on food prices in Egypt	Stocks, prices and trade
1.2.4 1.3.3	Concentration in world agricultural commodity markets (Retained, enhanced and merged)	1.3.3	Global production internationally traded Case Study 2: Export restrictions Case Study 3: The role of maritime trade chokepoints in global food security	Stocks, prices and trade
		1.4.1	**NEW** Global food and nutrition insecurity	Global food and nutrition insecurity
		1.5.1	**NEW** Global land degradation	Sustainability
		1.5.2	**NEW** Global One Health	Sustainability

Theme 2: UK Food Supply Sources

Indicators in 2021 UK FSR		Updated indicators and ordering for 2024 UK FSR		
2021 Indicator Number 2024 Indicator Number	Indicator name | 2024 decision	New number	Indicator name | Case Study	Grouping
2.1.1 2.1.1	UK Production Capability (Retained, enhanced and merged)	2.1.1	Overall sources of UK food	Food Sources
2.1.2 2.2.4	Current land area in production (Retained and enhanced)	2.1.2	Arable (grain, oilseed and potatoes)	Food Sources
2.1.3 2.1.1	UK food imports and exports (Merged)	2.1.3	Livestock and poultry products (meat, eggs & dairy)	Food Sources
2.1.4 2.1.1 and 3.2.3	EU share of UK imports (Merged)	2.1.4	Fruits and vegetables Case Study 1: Impact of drought and water stress on horticulture production in Spain	Food Sources

2.1.5 **2.1.1**	Overall diversity of supply (Merged)		**2.1.5**	Seafood	Food Sources
2.1.6 **2.1.2**	Domestic grain production (Retained and enhanced)		**2.2.1**	**NEW** Animal and plant health Case Study 2: Colorado Beetle (Leptinotarsa decemlineata) outbreak	Sustainability and Productivity
2.1.7 **2.1.3**	Livestock (Retained and enhanced)		**2.2.2**	Food waste	Sustainability and Productivity
2.1.8 **2.1.2 and 2.1.4**	Other domestic crops (Retained and enhanced)				
2.1.9 **2.1.4**	Supply sources of UK fresh fruit and vegetable imports (Merged)		**2.2.3**	Agricultural productivity	Sustainability and Productivity
2.1.10 **2.1.4**	Seasonality (Merged)				
2.1.11 **2.1.5**	Fish (Retained and enhanced)		**2.2.4**	Land use	Sustainability and Productivity
2.2.1 **3.1.1**	Essential Inputs (Merged)		**2.2.5**	Biodiversity New	Sustainability and Productivity
2.2.2 **2.2.2**	Agriculture and supply chain waste (Merged and enhanced)		**2.2.6**	Soil health	Sustainability and Productivity
2.2.3 **2.2.2**	Household food waste (Merged)		**2.2.7**	**NEW** Water quality	Sustainability and Productivity
2.3.1 **2.2.9**	Sustainable agriculture (Retained and enhanced)		**2.2.8**	**NEW** Greenhouse gas emissions	Sustainability and Productivity
2.3.2 **2.2.6**	UK Soil health (Retained and enhanced)		**2.2.9**	Sustainable farming	Sustainability and Productivity
2.3.3 **Features throughout Theme 2 in 2024 report**	Climate change impacts on yields (Merged)				
2.3.5 **Features in 2.2.5, 2.2.6 and 2.2.8**	Environmental impacts of agriculture (Merged)				

Theme 3: Food supply chain resilience

Indicators in 2021 UK FSR		Updated indicators and ordering for 2024 UK FSR		
2021 Indicator Number 2024 Indicator Number	Indicator name | key data point	New number	Indicator name | Case Study	Grouping
3.1.1 3.3.3	Business resilience and response (Merged)	3.1.1	**NEW** Agricultural Inputs	Input Dependencies
3.1.2 3.1.5	Energy dependency in the food sector (Retained and enhanced)	3.1.2	**NEW** Supply Chain Inputs Case Study 1: Fortified Flour-Calcium Carbonate	Input Dependencies
3.1.3 3.2.1	Transport dependency in the UK (Retained and enhanced)	3.1.3	Labour and Skills	Input Dependencies
3.1.4 3.2.2	Points of entry in the UK (Retained and enhanced)	3.1.4	**NEW** Water Case Study 2: Felixstowe Hydrocycle	Input Dependencies
3.1.5 3.2.2	Food imports via Short Straits (Merged)	3.1.5	Energy	Input Dependencies
3.1.6 3.2.3	Border closures (Retained and enhanced)	3.2.1	Transport	Movement of Goods
3.1.7 3.1.2	Key inputs to the food supply chain resilience (Retained and enhanced)	3.2.2	Points of Entry in the UK	Movement of Goods
3.1.8	Consumer behaviour (Removed)	3.2.3	**NEW** Import flows	Movement of Goods
3.1.9 3.1.3	Labour and skills dependency (Retained and enhanced)	3.3.1	Cyber security	Food Business
3.2.1 3.2.3	Cyber threat in the food supply chain (Retained and enhanced)	3.3.2	Diversity of food retailers	Food Business
3.2.2 3.4.1	Diversity of food retailers (Retained and enhanced)	3.3.3	**NEW** Business resilience	Food Business
3.2.3 3.4.2	Economic resilience in the food supply chain (Merged)			

Theme 4: Food Security at Household Level

Indicators in 2021 UK FSR		Updated indicators and ordering for 2024 UK FSR		
2021 Indicator Number 2024 Indicator Number	Indicator name | 2024 decision	New number	Indicator name | Case Study	Grouping
4.1.1 4.1.2	Food expenditure growth compared to other household spending growth (Retained and enhanced)	4.1.1	Household food security status	Affordability
4.1.2 4.1.2	Low-income households' share of spending on food (Retained, enhanced and merged)	4.1.2	Household spending on food	Affordability
4.1.3 4.1.3	Price changes of main food groups (Retained and enhanced)	4.1.3	Price changes of main food groups	Affordability
4.1.4 4.1.1	Household food security (Retained and enhanced)	4.1.4	Government support schemes	Affordability
4.1.5 4.2.1	Access to food shops in England (Retained and enhanced)	4.1.5	**NEW** Food aid	Affordability
4.2.1 4.1.4	Eligibility for Free School Meals (Retain, enhanced and merged)	4.2.1	Physical access to food shops	Access to food shops
4.2.2 4.1.4	Take-up of Healthy Start voucher scheme (Retained, enhanced and merged)	4.2.2	**NEW** Online access to food shops	Access to food shops
		4.3.1	**NEW** Consumption patterns	Diet and Nutrition
		4.3.2	**NEW** Healthy diet Case Study 1: The lived experience of food insecurity and its impact on health	Diet and Nutrition
		4.3.3	**NEW** Sustainable diet	Diet and Nutrition

Theme 5: Food Safety and Consumer Confidence

Indicators in 2021 UK FSR		Updated indicators and ordering for 2024 UK FSR		
2021 Indicator Number 2024 Indicator Number	Indicator name | 2024 decision	New number	Indicator name | Case Study	Grouping
5.1.1 5.1.1	Consumer confidence in the food system and its regulation (Retained and enhanced)	5.1.1	Consumer confidence in the food system and its regulation	Consumer confidence
5.1.2 5.1.2	Consumer concerns (Retained and enhanced)	5.1.2	Consumer concerns	Consumer confidence
5.1.3 5.3.2	Food business compliance with food safety regulation (Retained)	5.2.1	**NEW** Surveillance Sampling Case study 1:The Food Authenticity Network	Food Safety and Authenticity
5.1.4 5.2.2	Food safety incidents, alerts, and recalls. (Retained)	5.2.2	Food safety incidents, alerts, and recalls Case Study 2: Listeria monocytogenes outbreak linked to smoked fish Case Study 3: Determining increased risk to vibrio in seafood link to climate change	Food Safety and Authenticity
5.1.5 5.2.4	Prevalence of foodborne pathogens (Retained)	5.2.3	Foodborne pathogen surveillance	Food Safety and Authenticity
5.1.6 5.2.3	Foodborne disease outbreak surveillance (Retained)	5.2.4	Foodborne disease outbreak surveillance	Food Safety and Authenticity
5.1.7 5.3.1	Food crime (Retained)	5.2.5	Food crime	Food Safety and Authenticity

			Case Study 4: Strengthening the Line of Defence against Food Crime, Case Study 5: Disrupting the smokie trade	
		5.3.1	Food business compliance with food safety regulation	Food safety/hygiene and regulation
		5.3.3	**NEW** Safety of non-EU imports	Food safety/hygiene and regulation

Annex II

How the UKFSR incorporates the six dimensions of food security

Rationale

The UKFSR assesses food security across five 'themes' as a way of considering the whole UK food system. What food security means within those themes is understood according to the six 'dimensions' associated with the 1996 World Food Summit definition: food availability, food access, utilisation, stability, sustainability, and agency. This annex explains the dimensions and provides a table showing how the five UKFSR themes and indicators map onto the dimensions.

The six dimensions of food security

1996 World Food Summit definition defines food security as "when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life."

This definition was originally understood to comprise 4 dimensions and recently been given two additional dimensions:

The 4 original dimensions

- ***Food availability:*** "The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid)"
- ***Food access***: "Access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet. Entitlements are defined as the set of all commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources)"
- ***Utilisation***: "Utilisation of food through adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being where all physiological needs are met. This brings out the importance of non-food inputs in food security"
- ***Stability:*** *"*To be secure, a population, household or individuals must have access to adequate food at all times. They should not risk losing access to food as a consequence of sudden shocks (e.g. an economic or climatic crisis) or cyclical events (e.g. seasonal food insecurity). The concept of

stability can therefore both refer to the availability and access dimensions of food security"

Two additional dimensions (Food Policy Journal 2022)

- ***Sustainability***: "food system practices that contribute to long-term regeneration of natural, social, and economic systems, ensuring the food needs of the present generations are met without compromising food needs of future generations"
- ***Agency*****: "**the capacity of individuals and groups to exercise a degree of control over their own circumstances and to provide meaningful input into governance processes"

Recent discussion (Zurek, Ingram et al 2022) has further broken three of the dimensions (Availability, Access and Utilisation) into three elements, all either explicit or implicit in the World Food Summit definition. The UKFSR considers eight of the nine elements across the 5 themes.

- **Food availability** is broken down into: ***Production*** (how much and which types of food are available through local production); ***Distribution*** (how much food is made available [physically moved], in what form, when and to whom); and ***Exchange****:* how much of the available food is obtained through exchange mechanisms such as barter, trade, purchase or loans
- **Access to food** is broken down into: ***Affordability*** (the purchasing power of households or communities relative to the price of food); ***Allocation*** (the economic, social and political mechanisms governing when, where and how food can be accessed by consumers); and ***Preference*** (social, religious or cultural norms and values that influence consumer demand for certain types of food)
- **Food utilisation** is broken down into: ***Nutritional value*** (how much of the daily requirements of calories, vitamins, protein, and micronutrients are provided by the food people consume); ***Social value***: the social, religious and cultural functions, and benefits food provides; and ***Food safety*** (toxic contamination introduced during producing, processing and packaging, distribution or marketing food; and food-borne diseases such as salmonella and CJD)
- **Stability** is the stability of the above three dimensions, which itself is a definition of food security

Mapping the five UKFSR five themes to the six dimensions

The five themes enable the UKFSR to track food security (in its six dimensions) across the whole UK food system. The UK food system is the product of several interconnected systems including global food supply, UK food supply, ecological systems, and the supply chain. Each theme considers a 'system' or a 'cluster of systems' making up the wider UK food system. The themes apply a range of

indicators to the systems under consideration to provide specific food security measures that can be cyclically assessed.

Each theme considers the ‘cross theme’ interconnections of those systems, rather than viewing them in isolation. For example, domestic food production is facilitated by the global supply chain providing fertilisers and energy; the natural ecosystem enabling fertile soils and productivity; the food safety regime that ensures food is safe for consumers to eat; and the demand that makes business viable. Making these links also enables the identification of ‘feedback loops’ and ‘lock-ins’ between human and ecological systems and their various impacts, e.g. on human, animal and plant health (Ericksen, 2008).

The five themes also support the UKFSR to provide an evidence base for policy making. In comparison to the dimensions, the themes more easily correspond with policy areas, while also supporting readers to make strategic links between policy areas. For example, the ‘global food availability’ theme corresponds to a range of areas under foreign policy and the ‘supply chain resilience theme’ corresponds to trade, transport and energy, and other policy areas.

Using the 6-dimensional definition and five theme assessment helps the UKFSR capture the real-world multi-causality of food security. This in turn helps the UKFSR support evidence-based policy decisions that will shape food security on the ground.

No single theme looks at all six dimensions of the food security definition. Instead, there are usually two or three dimensions of focus for each theme depending on the part of the food system being considered. The five themes do not provide equal coverage of the dimensions given measures depend on suitable data being available for the UKFSR’s cyclical reporting. As a guide for readers, the table below maps the UKFSR themes and indicators to the six dimensions they cover. There is extensive coverage of availability, stability, accessibility, and sustainability throughout, while agency is covered less frequently, and in terms of the ‘elements’ under the dimensions, social value is not covered.

Themes and indicators	Food security dimension 6 dimensions (9 elements)
Theme 1: Global food availability	
1.1.1 Global food production	• Availability (Production)
1.1.2 Global food loss and waste	• Availability
1.1.3 Global cereal production	• Availability (Production)
1.1.4 Production of global livestock products	• Availability (Production)
1.1.5 Global fruit and vegetable production	• Availability (Production)
1.1.6 Global seafood production	• Availability (Production) • Sustainability
1.2.1 Global agricultural total factor productivity	• Availability (Production) • Sustainability
1.2.2 Global land use change	• Availability (Production) • Sustainability
1.2.3 Global fertiliser production	• Availability (Production) • Sustainability
1.2.4 Water availability, usage and quality for global agriculture	• Availability (Production) • Sustainability
1.3.1 Global stock to consumption ratios	• Availability (Distribution) • Stability
1.3.2 Global real prices ○ **Case study: The role of exchange rates on food prices in Egypt**	• Accessibility (Affordability) • Stability

Themes and indicators	Food security dimension 6 dimensions (9 elements)
1.3.3 Global production internationally traded ○ **Case study: Export restrictions** ○ **Case study: The role of maritime trade chokepoints in global food security**	• Availability (Distribution and Exchange) • Stability
1.4.1 Global food security and nutrition	• Accessibility (Affordability) • Utilisation (Nutritional value)
1.5.1 Global land degradation	• Sustainability
1.4.3 Global one health	• Utilisation (Food safety) • Stability • Sustainability
Theme 2: UK Food Supply Sources	
2.1.1 Overall sources of UK food	• Availability (Production and Exchange)
2.1.2 Arable products (grain, oilseeds and potatoes)	• Availability (Production and Exchange)
2.1.3 Livestock and poultry products (meat, eggs and dairy)	• Availability (Production and Exchange) • Access (Preference)
2.1.4 Fruits and vegetables **Case study: Impact of drought and water stress on horticulture production in Spain**	• Availability (Production and Exchange) • Access (Preference) • Sustainability
2.1.5 Seafood	• Availability (Production and Exchange) • Access (Preference) • Sustainability

Themes and indicators	Food security dimension 6 dimensions (9 elements)
2.2.1 Animal and plant health Case study: Colorado beetle	• Availability (Production) • Sustainability
2.2.2 Food waste	• Sustainability
2.2.3 Agricultural productivity	• Availability (Production) • Sustainability
2.2.4 Land use	• Availability (Production) • Sustainability
2.2.5 Biodiversity	• Sustainability
2.2.6 Soil health	• Sustainability
2.2.7 Water quality	• Sustainability
2.2.8 Greenhouse gas emissions	• Sustainability
2.2.9 Sustainable farming	• Sustainability
Theme 3: Food Supply Chain Resilience	
3.1.1 Agricultural inputs	• Food Availability (Production)
3.1.2 Supply chain inputs Case study: Flour fortification and calcium carbonate	• Food Availability (Production)
3.1.3 Labour and skills	• Food Availability (Production)
3.1.4 Water Case study: Felixstowe Hydrocycle	• Food Availability (Production) • Sustainability

Themes and indicators	Food security dimension 6 dimensions (9 elements)
3.1.5 Energy	• Stability
3.2.1 Transport	• Food Availability (Distribution)
3.2.2 Points of entry into the UK	• Food availability (Distribution) • Access to Food (Allocation)
3.2.3 Import flows	• Food Availability (Distribution)
3.3.1 Cyber security	• Stability
3.3.2 Diversity of food retailers	• Food Availability (Distribution and Exchange) • Access to Food (Allocation)
3.3.3 Business resilience	• Stability
Theme 4: Food Security at Household Level	
4.1.1 Household food security status	• Accessibility (Affordability) • Stability • Agency
4.1.2 Household spending on food	• Accessibility (Affordability) • Stability • Agency
4.1.3 Price changes of main food groups	• Accessibility (Affordability) • Stability
4.1.4 Government support schemes	• Accessibility (Affordability, Allocation)
4.1.5 Food aid	• Accessibility (Affordability, Allocation)

Themes and indicators	Food security dimension 6 dimensions (9 elements)
4.2.1 Physical access to food shops	• Accessibility (Allocation) • Agency
4.2.2 Online access to food shops	• Accessibility (Allocation) • Agency
4.3.1 Consumption patterns	• Accessibility (Preference) • Utilisation (Nutritional value) • Sustainability • Agency
4.3.2 Healthy diet ○ Case study: The lived experience of food insecurity and its impact on health	• Accessibility (Affordability and Preference) • Utilisation (Nutritional value)
4.3.3 Sustainable diet	• Sustainability
Theme 5: Food Safety and Consumer Confidence	
Indicator 5.1.1 Consumer confidence in the food systems and its regulation	• Accessibility (Affordability and Preference) • Utilisation (Food safety) • Agency
Indicator 5.1.2 Consumer concerns ○ Case study –Monitoring consumers' food safety behaviour	• Accessibility (Affordability and Preference) • Utilisation (Nutritional value and Food Safety) • Agency
Indicator 5.2.1 Surveillance Sampling ○ Case study –The Food Authenticity Network	• Utilisation (Food Safety)
Indicator 5.2.2 Food safety incidents, alerts, and recalls	• Utilisation (Food Safety)

Themes and indicators	Food security dimension 6 dimensions (9 elements)
○ Case study 1: Listeria monocytogenes outbreak linked to smoked fish ○ Case study 2: Determining increased risk of vibrio in seafood linked to climate change	
Indicator 5.2.3 Foodborne pathogen surveillance	• Utilisation (Food Safety)
Indicator 5.2.4 Foodborne disease outbreak surveillance	• Utilisation (Food Safety)
Indicator 5.2.5 Food Crime ○ Case study 1 – Strengthening the Lines of Defence against Food Crime ○ Case study 2 – Disrupting the 'smokie' trade	• Utilisation (Food Safety)
Indicator 5.3.1 Food business compliance and food hygiene regulation	• Utilisation (Food Safety)
Indicator 5.3.2 Safety of non-EU imports	• Access (Allocation) • Utilisation (Food Safety)

Annex III

Climate Change Scenarios

Representative concentration pathways

Representative concentration pathways (RCPs) are defined in terms of the amount of warming caused to the Earth from the imbalance between the energy received from the sun and the energy reflected back to space. The effect of this imbalance is called a forcing. Since greenhouse gases persist in the atmosphere, higher levels of greenhouse gas emissions are associated with a greater imbalance, greater forcing and hence more warming.

The four RCPs used in the IPCC s Fifth Assessment Report (IPCC, 'Climate Change 2014: Synthesis Report', 2014), and the climate model simulations performed as part of the Coupled Model Intercomparison Project Phase 5 (CMIP5) initiative, are:

- RCP8.5: High forcing scenario. This corresponds to high greenhouse gas emissions and negligible efforts to mitigate them. This is the highest concentration scenario modelled.
- RCP6.0: Medium-high forcing scenario.
- RCP4.5: Medium-low forcing scenario.
- RCP2.6: Low forcing scenario. This scenario involves aggressive mitigation with immediate and sustained reductions in greenhouse gas emissions, resulting in a significant reduction in CO_2 concentrations.

Shared socio-economic pathways

In the IPCC's Sixth Assessment Report (IPCC, Climate Change 2023: Synthesis Report', 2023), and the climate model simulations performed as part of the Coupled Model Intercomparison Project Phase 6 (CMIP6) initiative, climate change scenarios are expressed in terms of shared socio-economic pathways (SSPs). The SSPs reflect different trends in social, economic, and environmental developments such as population, economic growth, and urbanisation, split into five 'narratives'.

The five SSP narratives are combined with the forcing-driven RCPs to characterise plausible climatic change under alternative societal development pathways. The notation for the combined climate change scenarios incorporates both the SSP and the RCP. For example, the lowest forcing scenario (RCP2.6) is only achievable under the SSP1 narrative (Sustainability) and the scenario for this combination is referred to as 'SSP1-2.6'. Some of the SSPs are broadly comparable with the previous generation of RCPs. For example, SSP5-8.5 is

comparable with the RCP8.5 scenario; SSP2-4.5 is comparable with the RCP4.5 scenario; and SSP1-2.6 is comparable with the RCP2.6 scenario.

The SSP1-2.6 scenario most closely resembles the 2°C warming target. SSP5-8.5 is the worst-case scenario in terms of climatic change. The SSP most representative of current conditions is SSP2: Middle of the Road. Therefore, the SSP2-4.5 scenario might be the one most representative of the scenario we are following under current policy. However, most policy-relevant research has previously used the highest emissions pathway, RCP8.5 as the worst-case-scenario, and only one of the SSPs reaches those levels of emissions – SSP5: Fossil-fuelled Development.

Annex IV

Theme Appendices

Theme 5: Food Safety and Consumer Confidence

5.1.1 Consumer confidence

Food and You 2

The Food Standards Agency has been conducting the Food and You 2 survey twice a year since July 2020. The survey is conducted with adults (aged 16 years or over) living in households in England, Wales and Northern Ireland. Households are selected at random with approximately 5,800 adults from around 4,000 households taking part in each survey. Respondents can take part online or via post. More detail on the survey methodology can be found in the technical report.

Food in Scotland

The Food in Scotland Consumer Tracker Survey monitors attitudes, knowledge and reported behaviours relating to food. The Tracker is used to identify changes in behaviours and attitudes over time and since 2015 the survey has been undertaken bi-annually in July and December.

The research methodology is consistent across research waves to ensure comparability and samples (of respondents surveyed) is approximately 1,000 Scottish adults and is representative of the Scottish population, with data weighted on key demographics to match previous waves for waves 11-16. Fieldwork for Wave 17 was carried out during December 2023. The online self-completion survey ranged between 25-30 minutes for Waves 11-16. Wave 17 saw a shorter 7 minute survey length. Unlike with previous waves, not all results are directly comparable due to changes in some of the questions.

Due to methodological differences between the Food and You 2 survey and Food in Scotland Consumer Tracker Survey, these data sources are not directly comparable. For this reason, data from the two surveys have been reported separately.

5.2.1 Surveillance sampling

Veterinary medicines directorate (VMD) sampling programmes:

Legislative Framework:

Testing for residues in products of animal original (POAO) is an internationally recognised official control; it is a trade facilitating sanitary and phytosanitary (SPS) measure which is critical to ensuring the safety of produce to both domestic consumers as well as export markets. In practice, the VMD operates a programme of sampling and testing which is equivalent with the official control requirements outlined in Commission Implementing Regulation (EU) 2022/1646 (for prohibited substances and veterinary medicines) and Commission Implementing Regulation (EU) 2022/932 (for contaminants). The sampling requirements are implemented in GB by the Animals and Animal Products Regulations of 2015 in GB, as well as the assimilated Official Controls Regulations, or OCR (2017/625). Under this collective suite of legislation, the VMD (and the agencies they work with) have the power to collect samples throughout the calendar year, testing them for a range of compounds, reflecting what is available and not available for veterinary medicinal use. The number of routine samples is determined by the throughput data based on the criteria set in the legislation.

Investigation into Residues Violations:

All residues violations ('non-compliances') identified under the GB RCP are investigated on-farm, and provision for this enforcement action is given the by the aforementioned Animal & Animal Product Regulations. In such cases, field staff will conduct a back-trace to the farm of origin to identify the cause of any residues issues. Food safety risk assessments are conducted for each residues violation identified by the Food Incidents Teams at FSA and FSS. In the majority of cases, non-compliances result from human error or are first time offences; in such instances advice is provided to the farmer to assist in avoiding a re-occurrence in the future. In more serious cases where a producer is either a repeat offender or found to be negligent (or the use of an unauthorised/prohibited substance is identified) the animals can be destroyed without any compensation to the farmer and, in the most severe cases, enforcement notices can be issued and can lead to prosecution.

- A list of the veterinary medicines approved for use in the United Kingdom can be found in the VMD's Product Information Database, or PID.
- A list of veterinary medicine MRLs in Great Britain can be found in the VMD's MRL list. Within Table 2 of this document, a list of Prohibited Substances can be found.
- A list of contaminant MRLs (including limits for cadmium, lead, as well as dioxins and PCBs) can be found in assimilated Regulation 1881/2006, and pesticide MRLs within the Health & Safety Executives GB pesticide database.

5.2.2: Incidents, Alerts Recalls

Both the UK Food Law Code of Practice (FLCoP) and Scottish FLCoP, outline the definition of a food incident and the roles and responsibilities of the FSA, FSS and enforcement authorities, respectively. Both FLCoPs define a food incident as “any event where, based on the information available, there are concerns about actual or suspected threats to the safety, quality or integrity of food that could require intervention to protect consumers’ interests.” The Feed Law Code of Practice, which covers England, Wales and Northern Ireland, similarly defines feed incidents.

The potential hazard being investigated by FSA and FSS determines the incident category. The reporting systems differ between regulators so it is possible for incidents to have different categorisations based upon the area of concern, which may include potential concern where there is no actual risk to the safety, quality or integrity of the food and feed identified.

The food, feed and drink supply chains are complex and involve numerous food chain actors from primary producers to processors, packing providers, transporters and retailers. There are multiple points in the supply chain where potential hazards can be detected and communicated to regulators who in turn, alert consumers.

Fluctuation in incidents numbers is common, and subject to many factors such as an introduction of new regulations, trends in consumer behaviours, or a persistent ongoing issue. The number of incidents does not reflect the longevity or complexity of the investigation.

5.2.2 Case study 2: Determining increased risk of Vibrio in seafood linked to climate change

A ‘signal’ refers to information on the safety, quality or integrity of a food, feed or food contact material which may be a potential risk to the UK food chain.

5.2.5 Food Crime

National Disruptions are a validated law enforcement framework that measure when the NFCU has had a direct impact on serious organized food crime relating to UK food supply chains, such as successfully securing prosecutions against food criminals.

This validated law enforcement framework process is based on the National Serious Organised Crime Disruption process. Disruptions are uploaded onto a system which stores records of serious and organised crime disruption activity from across the law enforcement community.

NFCU Outcomes: Any action led, supported or co-ordinated by the NFCU that falls short of a national disruption but still:

- Develops capacity and capability to identify and deal with food crime or;
- Deters potential offenders from acting dishonestly or;
- Improves awareness of vulnerabilities and promotes the taking of action to improve protection thereof.

Glossary

For definition of food security and its dimensions see Annex II.

Terms A to E

Agronomy

The science of farming, including the study of soil, plants, and animals, and ways to improve the production of food on farms (Cambridge Dictionary).

Anthropogenic

From human sources or human induced.

Antimicrobial

A substance that kills microorganisms such as bacteria or mould, or stops them from growing and causing disease (National Cancer Institute).

Biofuels

Liquid fuels produced from renewable biological sources, including plants and algae. Biofuels offer a solution to one of the challenges of solar, wind, and other alternative energy sources (Department Of Energy Office of Science, 2024).

Biomass

The total mass of living things in a particular area (Cambridge Dictionary).

Blue water

Water from irrigation (rather than from rainfall).

Brackish water

Brackish water is water that is saltier than fresh water, but not as salty as seawater. It may result from mixing of seawater with fresh water, as in estuaries (EEA).

Bulk shipping

Bulk Cargo is cargo that is shipped loosely and unpackaged in large quantities (as opposed to being shipped in packages or containers) (UPS).

Carcase balance

Making the best possible, sustainable use of every part of the carcase and ensuring that costs are balanced.

Controlled Environmental Horticulture

The cultivation of crops within indoor production systems where advanced technology allows precise control of the environment.

Cultivar

A plant variety that has been produced in cultivation by selective breeding.

Current price

The value of money before adjusting for inflation.

Demersal fish

Demersal fish inhabit the bottom of the ocean. Key demersal species fished by the UK fleet include cod and haddock.

Disease burden

The public health and financial burden on society caused by microbiological foodborne disease.

Disposable income

The amount of money that households have available for spending and saving after direct taxes, such as Income Tax, National Insurance and Council Tax, have been accounted for.

Drying signal

Chemical signals sent from the roots to the shoots of a plant when the soil is dry. These signals regulate physiology and cause guard cells to close pores in the leaves, stopping water vapor from escaping.

Ecological status

An assessment of the change from natural state as a result of human activity. Bad ecological status refers to a severe change from natural state, poor refers to a major change, moderate refers to a moderate change, good refers to a slight change and high refers to a natural or almost natural state with no, or only minor evidence of distortion.

Economic reserve

Mineral (or “Ore”) Reserves are the smaller subset of Mineral Resources deemed economically viable for extraction. While Mineral Resources have potential economic value, the economic viability of extracting these minerals depends on factors such as market prices, extraction costs, and technological developments in metallurgy and processing. Reserves are the portion of Resources that can be realistically and economically mined based on location, quantity, grade, geological characteristics, and any other factor that impacts end product value (Resource Capital Funds). More information can be found on the USGS website here.

El Niño & La Niña

During normal conditions in the Pacific ocean, trade winds blow west along the equator, taking warm water from South America towards Asia. To replace that warm water, cold water rises from the depths — a process called upwelling. El Niño and La Niña are two opposing climate patterns that break these normal conditions. Scientists call these phenomena the El Niño-Southern Oscillation (ENSO) cycle. During El Niño, trade winds weaken. Warm water is pushed back east, toward the west coast of the Americas (NOAA). During La Niña events, trade winds are even stronger than usual, pushing more warm water toward Asia. Off the west coast of the Americas, upwelling increases, bringing cold, nutrient-rich water to the surface (NOAA).

Environment flow requirement

The amount of water needed to ensure that lakes and rivers don’t dry up.

Equivalised

The process of accounting for the fact that households with many members are likely to need a higher income, or have a higher household expenditure, to achieve the same standard of living as households with fewer members.

Eutrophication

Excessive richness of nutrients in a lake or other body of water, frequently due to run-off from the land, which causes a dense growth of plant life. Usually results in the depletion of dissolved oxygen.

EU-27

The 27 countries within the European Union, after the UK left the EU.

Terms F to J

Farrowing

The process by which a female pig gives birth.

Feed conversion ratio

The amount of meat or fish produced in kg from 1 kilogram of feed. Sometimes it is also expressed in the amount of energy, generally in kilojoules, that 1 kilogram of feed provides.

Fish landings

Landings represent aquatic animals that are caught and brought ashore for use. Discards are animals thrown back (alive or dead) into the sea after being caught during fishing activities (FishStat via Pauly, Zeller, and Palomares from Sea Around Us Concepts, Design and Data. – processed by Our World in Data).

Foraging

Searching for food.

Fungicide

Pesticides that kill or prevent the growth of fungi and their spores (National Pesticide Information Center).

Futures price

Futures prices are agreed-upon prices in a contract between two parties for the sale and delivery of the asset (commodities) at a specific time in the future. These contracts are traded in financial markets and provide a daily track of global commodity prices.

Groundwater

Water found in an aquifer (an aquifer is a body of porous rock or sediment saturated with groundwater) (National Geographic).

Grubbed

Removed and disposed of all unwanted vegetative matter from underground, such as stumps, roots, buried logs, and other debris.

Heat stress

The damaging physical effects of too much heat.

Inputs

Any resources used to create goods and services.

Intensive farming practices

A way of producing large amounts of crops, by using chemicals and machines.

Invertebrate

Any animal that lacks a vertebral column, or backbone (Britannica).

Irrigation

The practice of supplying water to an area of land through pipes or channels so that crops will grow.

Just-in-case

An inventory strategy where companies keep large inventories on hand.

Just-in-time

Inventory management method in which goods are received from suppliers only as they are needed.

Terms K to O

Lodging

The permanent displacement of a stem (or part of a stem) from a vertical posture. Used in relation to crops.

Macronutrient

Nutrients that provide calories or energy and are required in large amounts to maintain body functions and carry out the activities of daily life.

Mangrove

Mangroves are a group of trees and shrubs that live in the coastal intertidal zone (NOAA,2024).

Median

A measure of the average. The median is calculated by identifying the exact middle point in a set of observations. When the observations are ranked from lowest to highest, the median is the value in the exact middle of the observed values.

Micronutrient

Micronutrients are vitamins and minerals needed by the body in very small amounts. However, their impact on a body's health are critical, and deficiency in any of them can cause severe and even life-threatening conditions (WHO).

Monoculture

The cultivation or growth of a single crop or organism especially on agricultural or forest land (Merriam-Webster).

Natural capital

Natural capital can be defined as the world's stocks of natural assets which include geology, soil, air, water and all living things (World Forum on Natural Capital).

Terms P to T

Pastoral farming

Pastoral farming refers to the rearing of animals, either for meat, or for animal by-products (dairy, eggs and wool) (Amtec Group).

Pathogenic organism

A pathogenic organism is defined as any organism that can cause disease. Harmful pathogens are naturally present in the environment and our system of food regulation and controls aims to reduce the risk of food becoming contaminated with them in a way that may make us ill. However, it is not possible to remove this risk completely, so when an incident involving pathogens is reported, it is important that swift action is taken to identify the source and reduce any potential harm.

Pelagic fish

Fish that live in the pelagic zone of ocean or lake waters—being neither close to the bottom nor near the shore.

Permanent meadows and pasture

Land used for livestock grazing typically for more than 5 years (FAO,2020).

Precision agriculture

Precision agriculture (PA) is the science of improving crop yields and assisting management decisions using high technology sensor and analysis tools (Singh and others, 2020).

Producer Price Index

The Producer Price Index (PPI) program measures the average change over time in the selling prices received by domestic producers for their output. The prices included in the PPI are from the first commercial transaction for many products and some services (U.S. Bureau of Labor Statistics).

Production frontier

The combination of inputs that generate the maximum attainable output. It is reached when available inputs are used optimally.

Prompted / Unprompted

In a prompted response, survey responses are collected by asking respondents to select, rank or score options from a pre-defined list. For example, asking 'Do you have concerns about any of the following?' and providing respondents with a list of potential concerns they can select. In an unprompted response, survey responses are collected from an open-ended question where a list of options is not provided and respondents can enter any text. For example, 'What are your concerns about the food you eat?'.

Pulses

Pulses are the dry, edible seeds of plants in the legume family, including chickpeas, lentils, dry peas and beans.

Quintile

Any of five equal groups into which a population can be divided according to the distribution of values of a particular variable.

Real terms

The value of money after adjusting for inflation.

Recovery

The ability of the food system to return to desired outcomes following disruption. Food system examples include insurance to re-instate crops or physical infrastructure and emergency food distribution systems. This requires contingency planning and funding.

Red Tractor

Red Tractor is the UK's largest food chain assurance scheme, setting standards and ensuring compliance at every stage of the chain, to reassure consumers that food is produced safely and responsibly.

Regional concentration

The location of a few, well-defined industrial sectors in a region.

Renewable water resource

The sum of internal renewable water resources (IRWR) and external renewable water resources (ERWR). IRWR include the long-term average annual flow of rivers and recharge of aquifers generated from endogenous precipitation. Double counting of surface water and groundwater resources is avoided by deducting the overlap from the sum of the surface water and groundwater resources (FAO). ERWR are the part of the country's long-term average annual renewable water resources which are not generated in the country. It includes inflows from upstream countries (groundwater and surface water), and part of the water of border lakes and/or rivers (FAO).

Reorientation

Rejecting the food system outcomes status quo by accepting alternative food system outcomes.

Resilience

The ability to respond quickly to operational disruptions.

Robustness

The ability of the food system to resist disruptions to desired outcomes. Food system examples include developing more heat-tolerant crops, more diverse farming systems, strategic grain reserves and stronger food distribution infrastructure such as harbours or railways. This requires considerable political and financial investment.

Roots and Tubers

Root and tuber vegetables are the underground storage system of various plants found around the globe and include potatoes, yams, sweet potatoes, turnips, rutabagas, and celery roots (celeriac).

Salinization

Salinization is the increase of salt concentration in soil and is, in most cases, caused by dissolved salts in the water supply. This supply of water can be caused by flooding of the land by seawater, seepage of seawater or brackish groundwater through the soil from below.

Salt marsh

Salt marshes are coastal wetlands that are flooded and drained by salt water brought in by the tides (NOAA, 2024).

Saltwater intrusion

The process by which saltwater infiltrates a coastal aquifer, leading to contamination of fresh groundwater (UNDRR,2011).

Sanitary and phytosanitary (SPS) measure

Rules, measures and regulations designed to protect human, animal and plant life and health, from risks arising from additives, contaminants, toxins or disease-causing organisms. They ensure food is safe for consumption (Sanitary and phytosanitary measures | Access2Markets).

Scarcity-weighted blue water use

Scaling results by water availability to gain an understanding of water stress, rather than just water use.

Serogroup

A serogroup or serotype is a distinct variation within a species of bacteria or virus or among immune cells of different individuals.

Shared Socioeconomic Pathways (SSPs)

Shared Socioeconomic Pathways (SSPs) describe a set of alternative plausible trajectories of societal development, which are based on hypotheses about which societal elements are the most important determinants of challenges to climate change mitigation and adaptation (CEH,2020).

Shiga toxin-producing E-coli O157 and non-O157

Escherichia coli is a type of bacteria that can be found in the intestines of animals and humans. Shiga-toxin producing E-coli are strains of the bacterium which produce Shiga toxin, which can cause illness in humans.

Smokie(s)

A smokie is a food prepared by the illegal process of blowtorching the fleece from the unskinned carcass of a sheep of goat.

Standard Labour Requirement (SLR)

For UK statistical purposes, farms are grouped into size categories based on their total Standard Labour Requirement (SLR). The total SLR for each farm business is calculated by multiplying its crop areas and livestock numbers by the associated SLR coefficients and then summing the results for all enterprises on the farm. This is then divided by 1900 to determine the number of standard labour requirements for the farm (i.e. 1 SLR is equivalent to 1900 hours).

Supply chain

The system and resources required to move a product or service from supplier to customer.

Surface water

Surface water refers to water that flows or rests on land and is open to the atmosphere, including lakes, rivers, streams, and ponds (Murphy and Ramsey, 2007).

Thematic analysis

Qualitative analysis of transcripts from structured interviews which were analysed for patterns of response (themes) using an inductive approach.

Terms U to Z

Vector

An insect or animal that carries a disease from one animal or plant to another (Cambridge Dictionary).

Vernalisation

The cooling of a seed during germination to accelerate flowering when it is planted.

Wave

In a series of repeated surveys (for example a survey that is conducted once a year) each separate survey is referred to as a ‘wave’.

Zoonoses

An infectious or parasitic disease whose microbial or parasitic agents are naturally transmitted between humans and other animals (National Center for Biotechnology Information, 2022).

Acronyms

Acronym	Full term
AA	Allergen Alert
AARR	Annual Average Rate of Reduction
ACS	Association of Convenience Stores
AHC	After Housing Costs
AI	Artificial Intelligence
ALC	Agricultural Land Classification
AMIS	Agricultural Market Information System
AN	Ammonium Nitrate
APHA	Animal Plant Health Authority
ASF	African Swine Fever
AUK	Agriculture in the United Kingdom
BCP	Border Control Post
BEIS	Department for Business, Energy and Industrial Strategy
BHC	Before Housing Costs
BSE	Bovine Spongiform Encephalopathy
BTO	British Trust for Ornithology
BTOM	Border Target Operating Model
CAP	Common Agricultural Policy
CCA	Central Competent Authority
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CHEMET	Chemical Meteorology

Acronym	Full term
CMA	Competition and Markets Authority
CMC	Capacity Management Centre
CNI	Critical National Infrastructure
CO	Cabinet Office
CO_2	Carbon Dioxide
CoE(s)	Centre(s) of Expertise
COICOP	Classification of Individual Consumption according to Purpose
COVID-19	Coronavirus disease 2019
CPI	Consumer Price Index
CPIH	Consumer Prices Index including owner occupiers' housing costs
CT	Counter Terrorism
CVM	Chained Volume Measures
DDOS	Distributed Denial of Service
DEC	Diarrhoeagenic Escherichia coli
Defra	Department for Food, Environment and Rural Affairs
DESNZ	Department for Energy Security and Net Zero
DfE	Department for Education
DFT	Department for Transport
DHSC	Department for Health and Social Care
DNP	2,4-Dinitrophenol
DUKES	Digest of UK Energy Statistics
DWP	Department for Work and Pensions
E3C	Energy Emergency Executive Committee

Acronym	Full term
EA	Environment Agency
ECOSS	Electronic Communication of Surveillance in Scotland
eFOSS	Electronic Foodborne and non-foodborne outbreak surveillance system
ERS	Expedited Return Scheme
ERS	Economic Research Service
EU	European Union
EWG	Eatwell Guide
F&Y2	Food and You 2 Survey
FAFA	Food Alert for Action
FAN	Food Authenticity Network
FAO	Food and Agriculture Organisation of the United Nations
FBI	Farm Business Income
FBO	Food Business Operator
FCELG	Food Chain Emergency Liaison Group
FCSA	Food Crime Strategic Assessment `
FDF	Food and Drink Federation
FDM	Food and Drink Manufacturing
FFD	Food Feed and Drink
FFV	Fresh Fruit and Vegetables
FH	Food Hygiene
FHIS	Food Hygiene Information Scheme
FHRS	Food Hygiene Rating Scheme
FHS	Food Hypersensitivity

Acronym	Full term
FICR	Food Information for Consumers Regulation
FIES	Food Insecurity Experience Scale
FIIN	Food Industry Intelligence Network
FL	Food Law
FLCoP	Food Law Code of Practice
FLRS	Food Law Rating System
FNAO	Food not of animal origin
FoodSEqual	Food Systems Equality
FRIF	Food Resilience Industry Forum
FRS	Family Resources Survey
FS	Food Standards
FSA	Food Standards Agency
FSM	Free School Meals
FSS	Food Standards Scotland
FTE	Full Time Equivalent
FWB	Fusarium Wilt of Banana
FYE	Financial Year Ending
G7	Group of Seven
GBSF	Government Buying Standards for Food and Catering Services
GDP	Gross Domestic Product
GHG	Greenhouse Gas Emissions
GI	Gastrointestinal
GINs	Genetic Improvement Networks

Acronym	Full term
GOHI-FS	Global One Health Index-Food Security
GRFC	Global Report on Food Crisis
GSCOP	Groceries Supply Code of Practice
GSFC	Government Secured Freight Capacity
GSS	Government Statistical Service
GVA	Gross Value Added
HAF	Holiday Activities and Food
HaFS	Hospitality and Food Service
HFSS	High Fat, Sugar or Salt
HGV	Heavy Good Vehicles
HHI	Herfindahl-Hirschman Index
HI	Herfindahl Index
HMRC	His Majesty's Revenue and Customs
HRFNOA	High Risk Food not of animal origin
HSE	Health and Safety Executive
HUS	Haemolytic Uraemic Syndrome
IEFT	Industrial Energy Transformation Fund
IFAN	Independent Food Aid Network
IFPRI	International Food Policy Research Institute
IFS	Institute for Fiscal Studies
IMT	Incident Management Team
INNS	Invasive Non-native Species
IPAFFS	Import of Products, Animals, Food and Feed System

Acronym	Full term
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated Pest Management
ISAs	Information Sharing Agreements
JBS	Jose Batista Sobrinh
JIC	Just-in-case
JIT	Just-in-time
JNCC	Joint Nature Conservation Committee
K	Potash (Potassium salts used as fertilisers)
K_2O	Potassium Oxide
Ktoe	Thousand tonnes of oil equivalent
LA	Local Authority
LAEMS	Local Authority Enforcement Monitoring System
LDN	Land Degradation Neutrality
LNG	Liquified Natural Gas
MENA	Middle East and North Africa
MIRCA2000	Monthly Irrigated and Rainfed Crop Areas around the year 2000
MOC	Manual for Official Controls
MoD	Ministry of Defence
MoJ	Ministry of Justice
MRL	Maximum Residues Limits
$MtCO_2e$	Million tonnes of carbon dioxide equivalent
Mtoe	Million tonnes of oil equivalent
N	Nitrogen

Acronym	Full term
NCSC	National Cyber Security Centre
NDNS	National Diet and Nutrition Survey
NFCU	National Food Crime Unit
NHS	National Health Service
NoU	Number of Undernourished
NPI(s)	Non-pharmaceutical intervention(s)
NRR	National Risk Register
OCR	Official Control Regulations
OECD	Organisation for Economic Co-operation and Development
OIE	World Organisation for Animal Health
ONS	Office for National Statistics
OOH	Owner Occupiers' Housing Costs
OOH	Out of Home
OV(s)	Official Veterinarian(s)
P	Phosphorous
P_2O_5	Phosphorus pentoxide
PCBs	Polychlorinated biphenyls
PHA	Public Health Agency
PHE	Public Health England
PHS	Public Health Scotland
PHW	Public Health Wales
PID	Product Information Database
POAO	Products of animal origin

Acronym	Full term
PoU	Prevalence of Undernourishment
PPDS	Pre-packed for Direct Sale
PPP	Purchasing Power Parity
PRiF	Pesticide Residues in Food
PRIN	Product Recall Information Notice
PSD	Production, Supply and Distribution
RCA	Root Cause Analysis
RCP	Residues Control Programme
RIS	Road Investment Strategy
RoRo	Roll on roll off
RSPB	Royal Society for the Protection of Birds
SACN	Scientific Advisory Committee on Nutrition
SDG	Sustainable Development Goal
SFCIU	Scottish Food Crime and Incidents Unit
SGSS	Second Generation Surveillance System
SMEs	Small and Medium Enterprises
SND	Scottish National Database
SOFI	State of Food Security and Nutrition in the World
SOLAW	State of Land and Water
Spp.	species
SPS	Sanitary and phytosanitary
spvpm	seconds per vehicle per mile
SRN	Strategic Road Network

Acronym	Full term
SSP	Shared Socioeconomic Pathway
SSPCA	Scottish Society for Prevention of Cruelty to Animals
SST	Sea surface temperatures
STEC	Shiga toxin-producing E. coli O157 (STEC O157)
TFP	Total Factor Productivity
TR4	Tropical Race 4
TUKFS-SPF	Transforming UK Food Systems – Strategic Priorities Fund
UK	United Kingdom
UKCP18	UK Climate Projections
UKHSA	UK Health Security Agency
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Program
UPF	Ultra-processed Foods
USDA	United States Department of Agriculture
USGS	United States Geological Survey
VMD	Veterinary Medicines Directorate, part of Defra
VOCs	Volatile Organic Compounds
WBGT	Wet Bulb Globe Temperature
WCDA	Whitley Community Development Association
WFD	Water Framework Directive
WGS	Whole Genome Sequencing
WHO	World Health Organisation

Acronym	Full term
WRAP	Waste and Resources Action Programme
WRI	World Resources Institute
WTO	World Trade Organisation

About the UK Food Security Report

The UK Food Security Report (UKFSR) is an analysis of statistical data and broader supporting evidence relating to food security in the UK. It fulfils a duty under Part 2, Chapter 1 (Section 19) of the Agriculture Act 2020 to prepare and lay before Parliament at least once every three years **"a report containing an analysis on statistical data relating to food security in the United Kingdom"**.

The UKFSR examines past, current, and future trends relevant to food security to present a full and impartial analysis of UK food security. It draws on a broad range of published data from official, administrative, academic, intergovernmental and wider sources.

The UKFSR is intended as an independent evidence base to inform users rather than a policy or strategy. In practice this means that it provides government, Parliament, food chain stakeholders and the wider public with the data and analysis needed to monitor UK food security and develop effective responses to issues.

Contact and feedback

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You can also contact us via Twitter/X: @DefraStats

We want to understand the uses that readers make of this report. To help us ensure that future versions are better for you, please answer our short questionnaire to send us feedback via the QR code below.

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- Professor Lynn Frewer, Centre for Rural Economy, Newcastle University
- Dr Kenisha Garnett, Cranfield University
- Professor Emeritus Peter J. Gregory, School of Agriculture, Policy & Development, University of Reading
- Dr Saher Hasnain, Environmental Change Institute, University of Oxford.
- Alan Hayes, Strategic Advisor, Future Strategy
- Dr John Ingram, Food Systems Transformation Programme, University of Oxford
- Professor Peter Jackson, Institute for Sustainable Food, University of Sheffield
- Professor Alexandra Johnstone, The Rowett Institute, University of Aberdeen
- Dr Hannah Lambie-Mumford, Department of Politics and International Relations, University of Sheffield
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- Dr Rachel Loopstra, Department of Public Health, Policy and Systems, University of Liverpool
- Dr Katie McDermott, University of Leeds
- Dr Ian Noble, Chair of UK Food Sector Advisory Group – Innovate UK
- Dr Kelly Parsons, MRC Epidemiology Unit, University of Cambridge
- Dr Maddy Power (Assistant Professor), Wellcome Trust Research Fellow, Department of Health Sciences, University of York
- Dr Michelle Thomas, University of Reading
- Professor Carol Wagstaff, University of Reading