



THE BROKEN PLATE

2023

The State of the
Nation's Food System



Our food environment: vital signs, its impact on our lives and what needs to change to support us all to eat healthily and sustainably

ABOUT THE FOOD FOUNDATION



The Food Foundation is an independent charity working to address challenges in the food system in the interests of the UK public.

Working at the interface between academia and policymakers (parliamentarians, civil servants, local authorities, business leaders) we use a wide range of approaches to make change happen including events, publications, media stories, social media campaigns and multi-stakeholder partnerships. We also receive extensive direct input from the public to ensure their lived experience is reflected in our policy proposals. We collaborate with many partners on a range of different thematic areas, liaising with academics to generate evidence and campaigners who can drive change. We are independent of all political parties and businesses, and are not limited by a single issue or special interest.

Visit: foodfoundation.org.uk

DESIGN

whitecreativecompany.co.uk

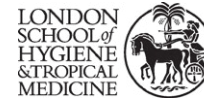
ONS CROWN COPYRIGHT INFORMATION This work contains statistical data from ONS which is Crown Copyright. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets which may not exactly reproduce National Statistics aggregates.

AUTHOR

Shona Goudie

WITH THANKS TO

The Food Foundation: Rebecca Tobi, Ria Saha, Indu Gurung, Alice English, Anna Taylor, Tim Lobstein
LSHTM: Genevieve Hadida, Georgia Behrens, Rosemary Green, Pauline Scheelbeek
University of Cambridge: Matthew Keeble, Thomas Burgoine, Jody Hoenink, Jean Adams
Nielsen: Debbie Bremner
Action on Sugar: Sonia Pombo, Zoe Davies
OHID: Caroline Hancock
University of Oxford: Asha Kaur, Pete Scarborough



WITH THANKS TO OUR FUNDER



The Nuffield Foundation is an independent charitable trust with a mission to advance social well-being. It funds research that informs social policy, primarily in Education, Welfare, and Justice. The Nuffield Foundation is the founder and co-funder of the Nuffield Council on Bioethics, the Ada Lovelace Institute and the Nuffield Family Justice Observatory. The Foundation has funded this project, but the views expressed are those of the authors and not necessarily the Foundation.

Visit www.nuffieldfoundation.org

Introduction

Food is an intrinsic part of all of our lives. It fuels our bodies and minds, providing us with the energy we need to move, think, work and reach our full potential. It can also be a source of pleasure and enjoyment: cooking and eating brings people together, building relationships across families, friends and communities. It can keep us healthy and well-nourished, boosting our wellbeing and helping us enjoy life to the fullest. A strong food system can underpin a strong society, having a profound impact on the nation's health, happiness and overall prosperity. Sustainably producing our food can shape our countryside and landscapes, boosting biodiversity and regenerating wildlife. Our food system can be instrumental in positively shaping our nation and our lives.

However, the current food system is not serving us well. For many, food is a source of anxiety and misery, with over a third of people reporting trying to lose weight most of



the time¹. Affordability challenges have meant that for many the basic need to nourish ourselves has become fraught with stress. 'Climate anxiety' is now affecting two thirds of people in the UK², and the food system is a significant contributor to climate change (a third of greenhouse gas emissions come from the food system³). What we eat has become the biggest risk factor for preventable disease⁴, taking a massive toll on our health, causing debilitating illness and placing an unsustainable strain on the NHS. This is not a result of individual failure – not a lack of will power nor a shortage of knowledge – but rather the consequence of a food system which traps us into eating in a way that is harmful to our health and harmful to our planet. For people with limited time and money, breaking free from this trap is an even greater challenge.

Food companies are also trapped in this system: they are required to sell us more and more food to generate greater profits for their investors. Tight competition to maximise market share creates an economic imperative to sell us foods that are cheap to produce and have the greatest profit margins – but these are the same foods that are making us unwell.

The food system was not always this way. Following the second world war, innovations in farming created a food system that could produce and sell us the most calories at the lowest cost, fulfilling the need that existed at the time. In doing so we have created another set of problems – mass producing cheap foods that cause disease and damage the environment. But this shows us that with innovative thinking, changing the system to adapt to our shifting needs is possible.

This year's *Broken Plate* report assesses eight key metrics which provide an indication of the state of our food environment and demonstrate how difficult it is to eat healthily and sustainably when the affordability, availability and appeal of unhealthy and unsustainable foods point us in the opposite direction. The impact of this on what we eat is shown in two metrics assessing the quality of our diets, and the subsequent impact on our health is shown in five further metrics. Together these metrics paint a picture of where we are now and critical next steps for ensuring we can all eat well.

At a glance

FOOD ENVIRONMENT METRICS

PRICE AND AFFORDABILITY



Affordability of a healthy diet P8

The most deprived fifth of the population would need to spend 50% of their disposable income on food to meet the cost of the Government-recommended healthy diet. This compares to just 11% for the least deprived fifth.

What needs to happen: Ensure everyone has sufficient income to afford to eat a healthy diet.



Cost of healthy food P10

More healthy foods are over twice as expensive per calorie as less healthy foods.

What needs to happen: Rebalance the cost of food so healthy options are the most affordable.



Cost of sustainable alternatives P12

More sustainable plant-based alternatives to chicken are approximately 27% more expensive than chicken breast.

What needs to happen: Ensure that price isn't a barrier to choosing more sustainable and healthy options, especially for people on low incomes.

AVAILABILITY



Places to buy food on the high street P16

1 in 4 places to buy food are fast-food outlets.

What needs to happen: Use local authority planning powers to prevent further proliferation of unhealthy fast-food outlets.



Availability of low sugar options in key children's food categories P18

Only 7% of breakfast cereals and 8% of yogurts marketed to children are low in sugar.

What needs to happen: Reformulate products with too much sugar and stop marketing unhealthy food to children.



Business transparency on sales of healthy and sustainable food P20

Just 8 major UK food retailer, caterer or restaurant chains currently report publicly on sales of healthy foods, fruit and vegetables, or animal vs plant-based proteins.

What needs to happen: Increase transparency around the types of food businesses sell, with targets for boosting sales of healthy and sustainable foods.

APPEAL



Marketing of baby and toddler snacks P24

97% of snacks marketed towards babies and toddlers feature a nutritional or health claim on the front of the packaging despite often being high in sugar for this age group. What needs to happen: Regulate marketing and composition of toddler and baby foods, and restrict nutrition and health claims on front of packaging.



Advertising spend on food P26

A third (33%) of food and soft drink advertising spend goes towards confectionery, snacks, desserts and soft drinks compared to just 1% for fruit and vegetables. What needs to happen: Increase advertising spend on healthy foods and decrease advertising spend on less healthy foods.

OUTCOME METRICS

DIET QUALITY



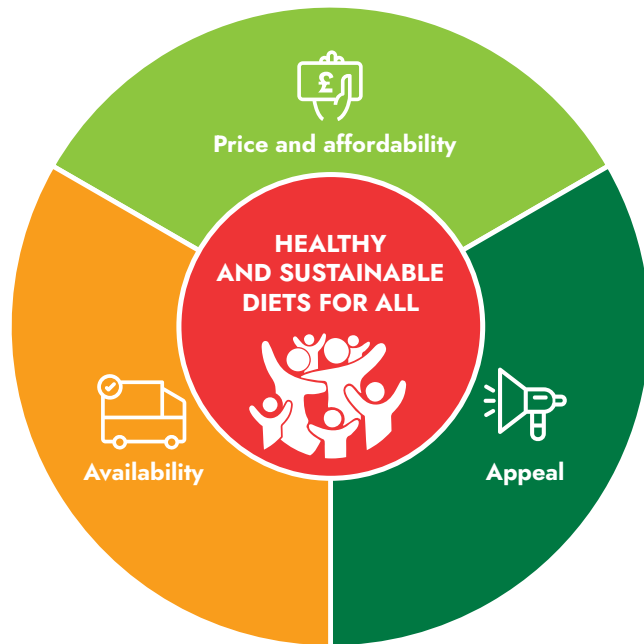
Nutritious food consumption P30

The most deprived fifth of adults consume less fruit and veg (37% less), oily fish (54% less) and dietary fibre (17% less) than the least deprived fifth.



Ultra-processed foods consumption P32

56% of calories consumed by older children and adults are from ultra-processed foods.



HEALTH OUTCOMES



Children's dental decay P36

Almost a quarter (24%) of 5-year-olds have dental decay, with 2.5 times as many children in the most deprived fifth affected compared with the least deprived fifth.



Children's growth P38

Children in the most deprived tenth of the population are on average up to 1.3cm shorter than children in the least deprived tenth by age 10–11.



Children's weight P40

Children in the most deprived fifth of the population are over twice as likely to be living with obesity as those in the least deprived fifth by their first year of school.



Healthy life expectancy P42

Healthy life expectancy in the most deprived tenth of the population is 19 years lower for women and 18 years lower for men than in the least deprived tenth.



Diabetes-related amputations P44

Nearly 9,600 diabetes-related amputations are carried out on average per year – an increase of 19% in six years.

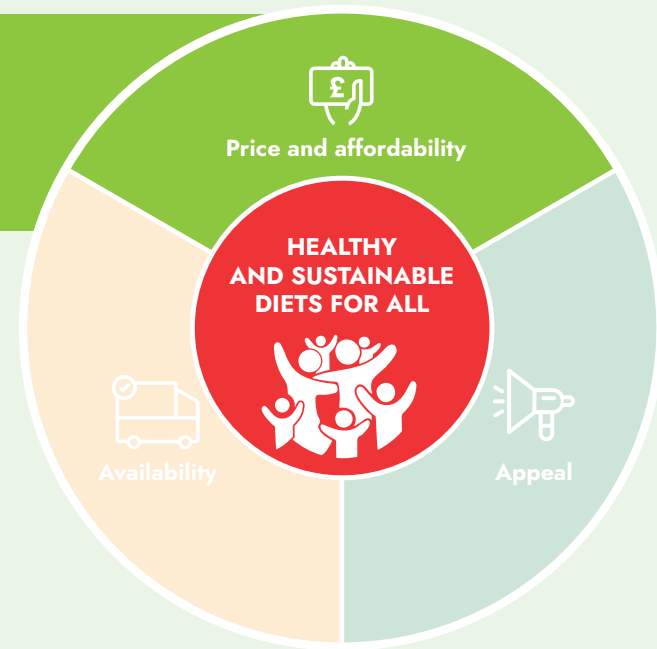




FOOD ENVIRONMENT METRICS

Price and Affordability

Affordability plays a major role in determining the food that people purchase. The ability to afford a healthy and sustainable diet is not only affected by food prices, but also by a family's or individual's income, and the costs of other essentials. For many people, a healthy and sustainable diet is simply out of reach financially; even for people on slightly higher incomes, it can be less appealing because it's the more expensive option.



This section looks at three key metrics on price and affordability:



P8
Affordability of a healthy diet



P10
Cost of healthy food



P12
Cost of sustainable alternatives

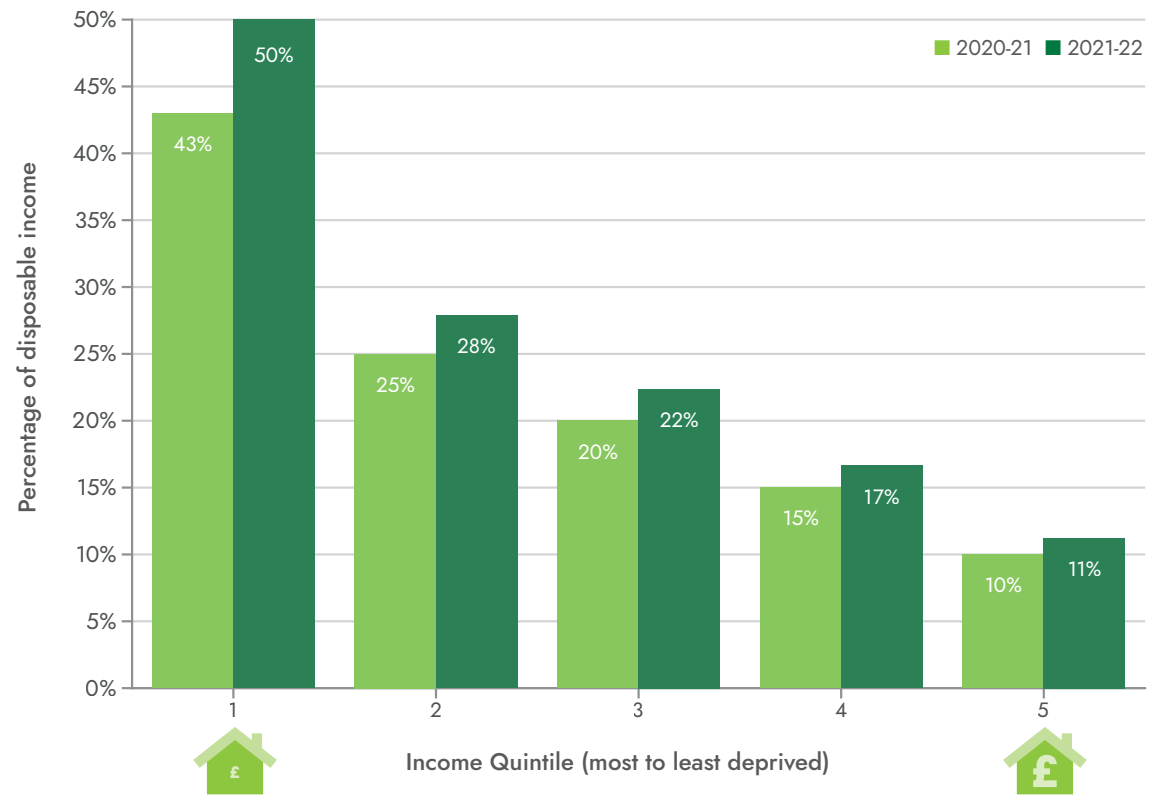


Affordability of a healthy diet

The **most deprived fifth** of the population would need to spend **50%** of their disposable income on food to meet the cost of the Government-recommended healthy diet. This compares to just **11%** for the **least deprived fifth**.



Percentage of disposable income required to afford the Eatwell Guide by income quintile



Source: FoodDB, University of Oxford; London School of Hygiene & Tropical Medicine secondary analysis of the Family Resources Survey 2021-22

People’s ability to afford healthy food is a major determinant in the nutritional quality of their diets. Our analysis shows that the most deprived fifth of UK households would need to spend an estimated 50% of their disposable income (after housing costs) on food in order to eat in line with the Eatwell Guide, the Government’s recommended healthy diet⁵. The situation has deteriorated from the previous year where the most deprived fifth would need to spend 43% of their disposable income. This compares to just 11% for the least deprived fifth of households. If everyone ate in line with the recommendations of the Eatwell Guide there would not only be substantial health benefits, but it would decrease greenhouse gas emissions by 30%⁶.

Given these findings, it is hardly surprising that there are such high levels of food insecurity in the UK, with millions of people simply unable to afford sufficient food, and millions more relying on food of limited nutritional value. The Government’s own data found that approximately 1 in 14 households (7%) were food insecure in 2021/22⁷. Subsequent measurement by The Food Foundation shows that levels have skyrocketed since then to over 1 in 6 households (17%)⁸.



The affordability of a healthy diet is particularly challenging for people in receipt of benefits, with much greater levels of food insecurity experienced by this group compared with the general population. As highlighted in research by Joseph Rowntree Foundation and Trussell Trust⁹, benefit levels are not informed by the cost of essentials (including food). As a result, they often provide insufficient income for families to achieve a socially acceptable minimum standard of living. To provide some relief during the hardship of the Covid-19 pandemic, the Government increased Universal Credit payments by £20 per week. The Government’s own data showed the uplift reduced food insecurity among those who received it, and that food insecurity rose again when it was removed. In contrast, food insecurity levels remained high and constant among households on legacy benefits who did not receive the uplift¹⁰. This highlights the critical role the £20 uplift played in protecting families from food insecurity, and provides compelling evidence that increasing incomes through the benefit system is an effective and targeted solution.

These findings point to the need for Government to actively track the cost of a healthy and sustainable diet so as to inform benefits levels and ensure that a healthy and sustainable diet is affordable for everyone regardless of income.



RT HON SIR STEPHEN TIMMS MP
CHAIR, WORK AND PENSIONS SELECT COMMITTEE

Someone born in Westminster, one of the wealthiest local authorities, can expect to live nearly ten years more than if they were born in Blackpool, one of the poorest. There are many reasons why, but the cost of a healthy diet is surely one of them. This report shows that a low income family would have to spend 50% of their income on groceries to eat the Government’s recommended diet. That is clearly not feasible.

The cost of a healthy diet is not just borne by the individual. The Government’s own food strategy found that poorly nourished children struggle to concentrate at school and are more likely to suffer long-term health problems. To enable every child to fulfil their potential, we need to make a healthy diet affordable.

The benefits system is the place to start. Benefit levels don’t seem at present to be benchmarked to essentials, like the cost of a healthy diet, but instead result from a series of arbitrary changes. The Work and Pensions Select Committee is currently running an inquiry on the level of benefits, to consider how the levels should be set. One of our ambitions should surely be to ensure that everyone can afford a healthy diet.

WHAT NEEDS TO HAPPEN

Ensure everyone has sufficient income to afford to eat a healthy diet.

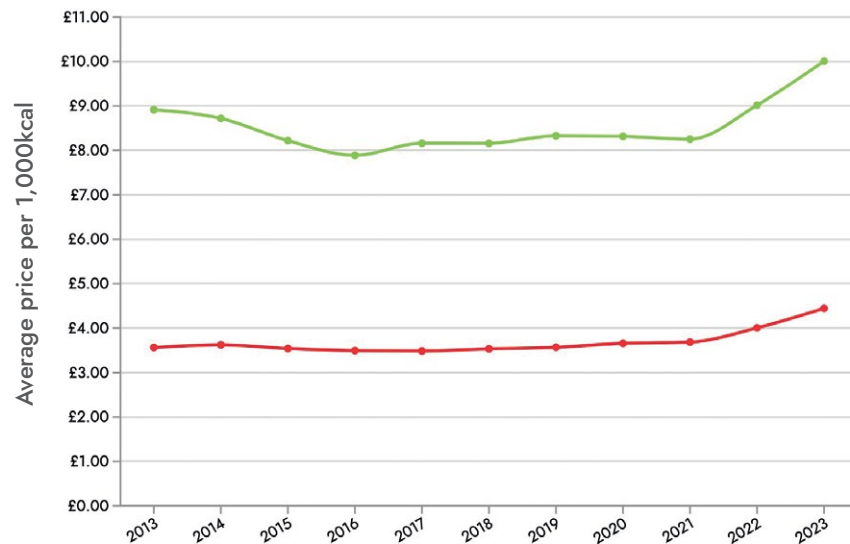


Cost of healthy food

More healthy foods are **over twice as expensive** per calorie as less healthy foods.

Average price of food and drink by Nutrient Profile Modelling score category

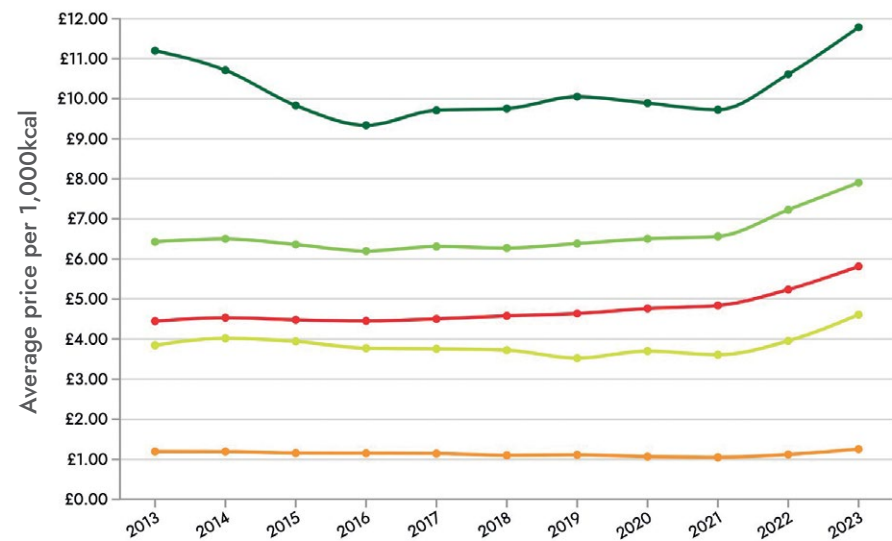
More healthy Less healthy



Source: MRC Epidemiology Unit (University of Cambridge) analysis of the Consumer Price Index, ONS

Average price of food and drink by Eatwell Guide food category

Fruit and vegetables Meat, fish, eggs, beans, other sources of non-dairy protein
Milk and dairy foods High in fat and/or sugar food and drinks Bread, rice, potatoes, pasta



Source: MRC Epidemiology Unit (University of Cambridge) analysis of the Consumer Price Index, ONS

Please note: due to methodological changes, findings are not directly comparable to previous reports.

Rapidly rising food prices have been headline news throughout the past year, with food inflation hitting a high of 19.1% in April 2023 according to government figures¹¹. Food prices began rising in July 2021 as the world emerged from the pandemic and demand for certain products surged, resulting in shortages of food and disruptions to food supply chains, as well as to food supply inputs such as animal feed, gas, CO₂ and fertiliser¹². The situation was then sharply exacerbated by the invasion of Ukraine, driving up global prices due to wheat and cooking oil export disruption (along with gas and fertiliser supply issues)¹³.

While food inflation has been a global crisis, the UK has felt the effects of rising food prices to an even greater extent than many other countries due to Brexit's impact on trade and on the availability of migrant workers. According to a study by the London School of Economics, leaving the European Union increased the price of food by 6%, adding £5.8 billion to UK food bills in 2020–2021¹⁴ - a significant amount for families already on tight budgets .

Dietary health is affected by the absolute price of food relative to income, as well as the relative price of healthy and unhealthy food. Analysis by The University of Cambridge for *Broken Plate* has found that, on average, more healthy foods* are over twice as expensive as less healthy foods per calorie (£10.00 per 1,000kcal compared to £4.45). In the past two years, more healthy foods have increased in price by £1.76 per 1,000kcal compared with £0.76 for less healthy foods. When broken down by Eatwell Guide category, fruit and

vegetables remain the most expensive category by a significant margin, costing on average £11.79 per 1,000kcal compared with food and drink high in fat and/or sugar costing just £5.82 per 1,000kcal. Looking at the price differential between healthy and unhealthy foods helps explain the higher levels of obesity seen in lower income groups: affordability barriers trap low income families into eating less healthy diets. These price differences have been consistent for several years, but the rising cost of living means ever-growing numbers of people need to squeeze their budgets, making them increasingly likely to be pushed towards less healthy options.

To address food insecurity and diet-related health inequalities, it is critical that the cost of food is rebalanced to make healthy food the most affordable option. Retailers have a fundamental role to play in ensuring that families can secure adequate food to prevent hunger and prevent a shift to less healthy options as a strategy for managing financial pressures. Health should not be sacrificed for price. The Food Foundation's Kids Food Guarantee provides a roadmap of actions that retailers should be taking to guarantee that children can eat well during the cost-of-living crisis and so prevent lasting damage to their health and wellbeing¹⁵. Longer term as we move out of the cost-of-living crisis, fiscal measures and subsidies will be necessary to rebalance the cost of food so that healthy and sustainable options become the most affordable.

*As defined by the Government's Nutrient Profile Model – foods are categorised as more or less healthy depending on the levels of energy, saturated fat, sugar and salt (higher content is less healthy); and fruit, veg and nuts, fibre and protein (higher content is more healthy).



DOMINIC WATTERS,
FOOD FOUNDATION
AMBASSADOR AND FOOD
IS CARE FOUNDER

Understanding food insecurity as an expert by experience means communicating the reality of price rises while simultaneously addressing the disbelief and disregard with which my concerns are often met. This year's Broken Plate data confirms that rising costs, not reflected in benefits, are making the barest essentials unmanageable for the poorest in society. But food insecurity isn't experienced in isolation: my council estate is a food desert where access to nutrition is limited and access to gas and electric is compromised by a broken top-up system. Raw ingredients are often a luxury now for the poorest in the population as the price of cooking rules them out. Together, these factors have a huge impact on a person's health and wellbeing. I hear my neighbours discussing the all-consuming challenge of making ends meet. They spend all day on the bus traveling from supermarket to supermarket in search of bargain deals on microwave meals, they wash their clothes less to save £3 a month on electricity, and they can't afford to send their children to the clubs they love. The data in Broken Plate speaks to a system that keeps already disadvantaged families from flourishing: hopefully the inclusion of a voice like mine can make this year's report a vehicle for change.

WHAT NEEDS TO HAPPEN

Rebalance the cost of food so healthy options are the most affordable.

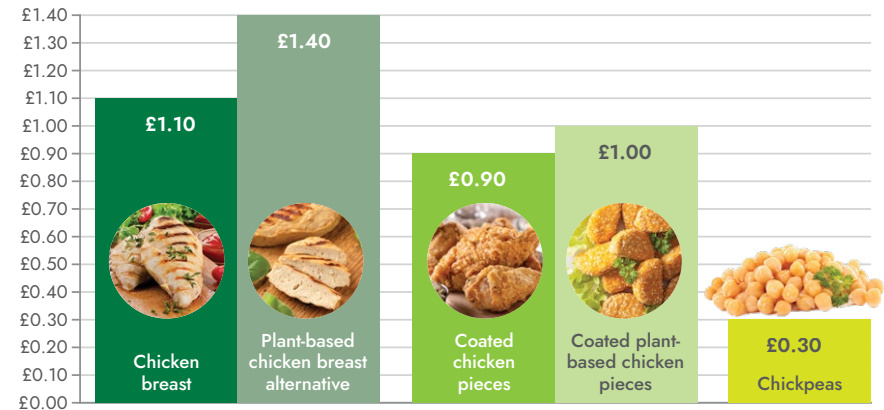


Cost of sustainable alternatives

More sustainable plant-based alternatives to chicken are approximately **27% more expensive** than chicken breast.

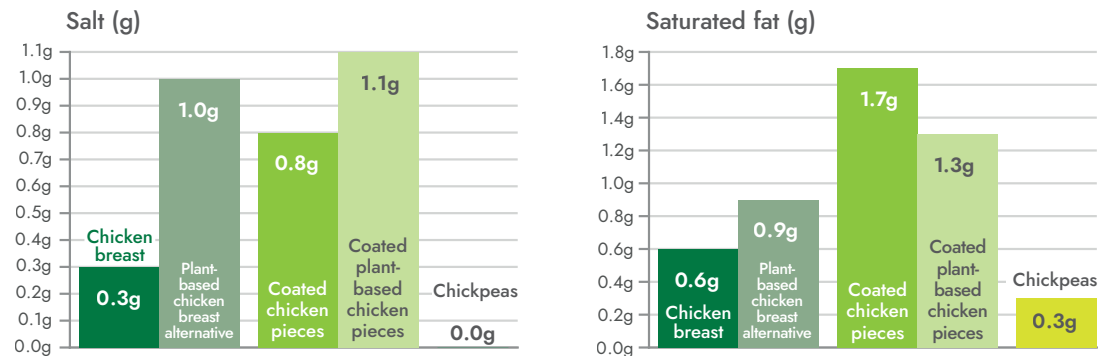


Price per 100g of chicken and plant-based alternatives



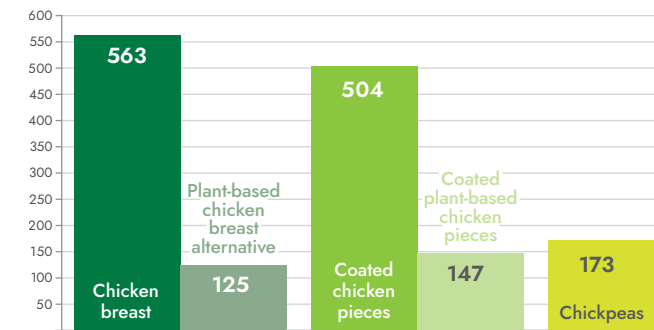
Source: Data collected from Aldi, Tesco and Waitrose and analysed by the London School of Hygiene & Tropical Medicine.

Average nutrient content per 100g of chicken and plant-based alternatives



Source: Data collected from Aldi, Tesco and Waitrose and analysed by the London School of Hygiene & Tropical Medicine.

Greenhouse gas emissions per 100g of chicken and plant-based alternatives (gCO₂e)ⁱ

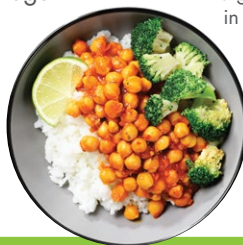


Source: Analysis by the London School of Hygiene & Tropical Medicine.

On average, UK consumption of meat per person is 98kg per year – well above the global average of 63kg per year¹⁶. Meat production is a significant contributor to climate change: in the UK, the food system accounts for up to 20% of domestic greenhouse gas emissions¹⁷ with meat accounting for the largest proportion of emissions associated with diets (32%)¹⁸. Unless production and consumption of meat is reduced, it will be impossible for the Government to achieve their net zero commitment by 2050¹⁹.

While red meat intakes have declined, chicken consumption has grown over the past decade, accounting for over 50% of total UK meat consumption²⁰. Chicken is cheaper relative to red meat and is thus a more affordable source of protein for many. While direct emissions associated with poultry are lower than for red meat²¹ (e.g. beef), chicken-rearing indirectly contributes to deforestation, as a result of chicken typically being fed soy. This effectively shifts greenhouse gas emissions offshore to countries such as Brazil, where significant amounts of land are cleared of forest in order to grow soy that is then exported as feed for the poultry and pig sectors.

A survey conducted by the *London School of Hygiene & Tropical Medicine (LSHTM)* for *Broken Plate* found that plain plant-based chicken alternatives are on average 27% more expensive than a chicken breast, despite having substantially lower greenhouse gas emissions. There was less of a notable difference in price between the more processed coated chicken pieces and their plant-based



alternatives, although the coated plant-based coated chicken pieces again had lower greenhouse gas emissions.

There was wide variation in the health and nutrient profiles of plant-based chicken alternatives, emphasising the need for manufacturers to ensure that there aren't unintended consequences for public health in promoting plant-based alternatives. While the plain plant-based alternatives scored less well than a plain chicken breast across most key nutritional indicators (calories, protein, sugar, saturated fat and particularly salt - the exception was fibre content), there was no clear pattern for the coated chicken pieces and their plant-based alternatives. Looking at coated chicken pieces, their plant-based alternatives were higher in sugar, salt and calories, but lower in saturated fat and higher in fibre.

Canned chickpeas, a less processed plant-based alternative to meat, not only came out as the cheapest of all options but also scored well across a range of different health indicators with comparable GHGEs to the plant-based chicken alternatives. There is therefore a real opportunity in the UK to champion and better promote pulses as an affordable, healthy and sustainable alternative to meat.

ⁱ A larger number of plant-based chicken alternatives were included in the nutrient and price calculations than for the environmental footprint data. This is due to the small number of plant-based products for which accurate environmental impact data is available. The data were considered valid due to the fact that the scant data on environmental impact available makes it normal to rely on just one estimate rather than pooling multiple estimates.



SOPHIE LAWRENCE,
RATHBONE GREENBANK
INVESTMENTS

As an ethical, sustainable and impact investor, we are interested in the long-term resilience of companies and their ability to adapt in the face of the several sustainability challenges we face. We recently analysed how the different alternative proteins compare and found similar results to the Broken Plate report, with plant-based meat alternatives performing the strongest from an environmental perspective. Although plant-based products are less affordable than their animal-based equivalents and were among the least healthy compared to the other types of alternative protein, they did perform well on other social factors. With product innovation expected to lead to a reduction in costs over time as well as (we hope) an improved health profile, plant-based meat alternatives represent a unique long-term sustainable investment opportunity.

However, to better understand the risks and opportunities facing companies, we need access to good quality and comparable data. A key focus for us is therefore engaging with companies to understand their performance including our work with the Investor Coalition on Food Policy, calling on the UK Government to introduce mandatory reporting for food sector companies of health and sustainability metrics.

WHAT NEEDS TO HAPPEN

Ensure that price isn't a barrier to choosing more sustainable and healthy options, especially for people on low incomes.

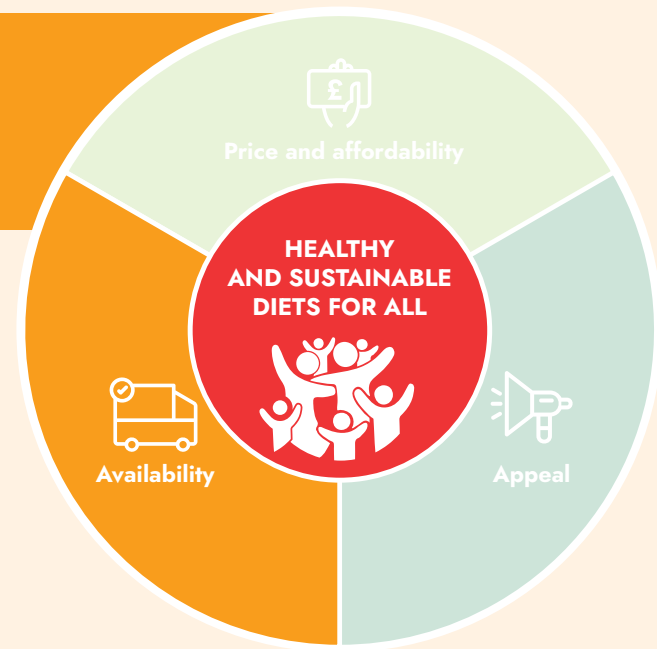




FOOD ENVIRONMENT METRICS

Availability

The ease with which people can access healthy and sustainable foods is an important factor in determining what they eat. People are understandably more likely to eat food which is convenient and readily available. This is important across all settings where people spend time eating or buying food, including high streets, restaurants, takeaway outlets, school canteens and supermarkets.



This section looks at three key metrics on availability:



P16
Places to buy food on the high street



P18
Availability of low sugar options in key children's food categories



P20
Businesses transparency on sales of healthy and sustainable foods

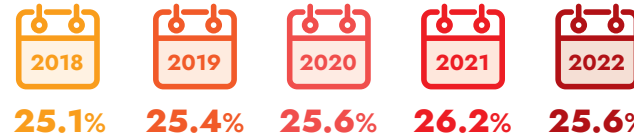


Places to buy food on the high street

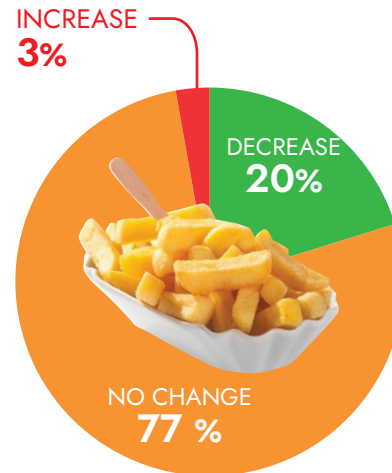
1 in 4 places to buy food are fast-food outlets.



Proportion of all food outlets in England that are fast-food outlets

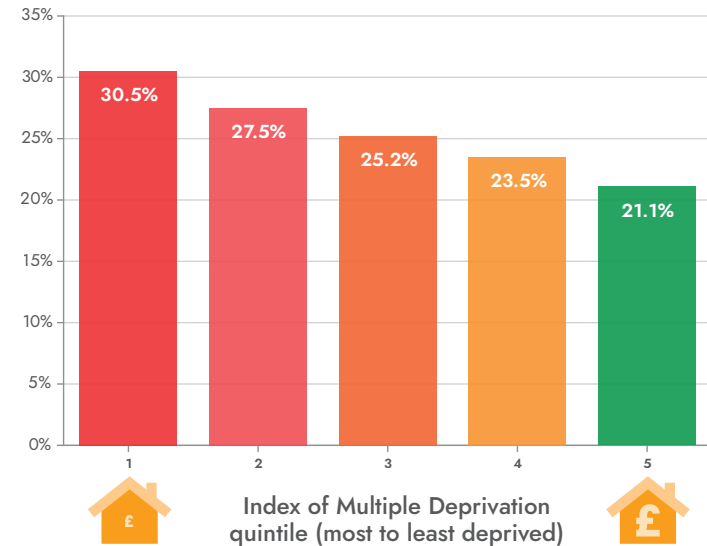


Changes in proportion of food outlets that are fast-food outlets from 2021 to 2022 (number of local authorities)



*increase or decrease of greater than 5%

Percentage of all food outlets in England that are fast-food outlets by deprivation group



Source: Data from Ordnance Survey and analysed in collaboration with the MRC Epidemiology Unit at the University of Cambridge. © Crown copyright and database rights 2023 Ordnance Survey (100025252). This product includes data licensed from PointX © Database Right/Copyright (2023) and OS © Crown Copyright (2023). All rights reserved.

Fast-food takeaways are abundant across the UK, often offering options which appeal to people's need for cheap and convenient food but with the downside of being high in calories and lacking in nutrients. There is a fast-food outlet for approximately every 1,200 people in the UK – a similar number to that seen in the US, and much more numerous than many other countries of similar economic status. For example, Spain has a fast-food outlet for every 3,000 people²².

The latest data from Ordnance Survey, analysed in collaboration with the University of Cambridge, show that as of June 2022, an average of 1 in 4 (25.6%) places to buy food in England are fast-food outlets, with no meaningful improvement in recent years (a range of 25.1-26.2% over the five years of monitoring by Broken Plate). However, more positively, on a local authority level only 3% have seen an increase in density of fast-food outlets and 20% have seen a decrease from 2021 to 2022, likely reflecting the impact of the pandemic. There is substantial variation in the density of fast-food outlets across local authorities, ranging from 7.4% to 39.7%.

The average proportion of fast-food outlets is much greater in more deprived areas of the country – 21% in the least deprived local authorities compared with 31% in the most deprived. Proximity to fast-food outlets has been shown to be linked to increased fast-food consumption and increased bodyweight^{23,24}. This being the case, the greater availability

of fast food in deprived areas is likely to be a contributing factor to the socio-economic inequalities seen across obesity levels. This is an example of the economic and social disparities which are 'reflected in places' built environment' – a concern highlighted in the Government's Levelling Up White Paper. Not only are takeaways damaging to health, but they can also create less pleasant neighbourhoods to be living in. Therefore, enforcing stricter regulations on the opening of fast-food outlets could simultaneously deliver benefits in tackling health inequalities while also increasing people's satisfaction with the areas in which they live.

Current policies give potential for local planners to regulate takeaways but there are a number of barriers to implementation. Despite fast food's significant health consequences, 80% of takeaway food outlet planning criteria are not health-focused²⁵. However, it is possible for local areas to do more to improve food environments through regulation of fast-food takeaways. Last year South Tyneside Council refused plans for new takeaways because of their drive to reduce obesity²⁶. Gateshead Council have also shown strong leadership in this area, successfully reducing the proportion of fast-food outlets by 14% by utilising their planning policy²⁷. As part of the effort to empower local leadership through levelling up, councils and local authorities need to be better supported and encouraged to use the powers available to them to transform their town centres and high streets to facilitate better diets and health.



JUSTIN VARNEY,
DIRECTOR OF PUBLIC
HEALTH AT BIRMINGHAM
CITY COUNCIL

Fast Food doesn't always mean unhealthy, unsustainable food but sadly most of the time it does and that needs to change. We live in a world in which most of us are resource poor not just cash poor, whether time, capability or access to affordable ingredients. So fast food is embedded into our lives and we need to recognise that and work with the sector as part of our approach to creating a healthy, safe, sustainable and affordable food system. The growth of dark kitchens and home delivery apps mean the sector is changing, particularly in the post pandemic world, but it is still a risky business with a high rate of business churn and it doesn't have a great reputation for 'good work' or career progression. This sector has shown it can change and we need to work constructively with the industry to move to healthier, affordable options created by staff working in 'good jobs' with produce that is sourced through local supply chains. Across the country there are good examples of positive collaboration – planning and licensing are also part of the solution but have significant limitations. So if we really want to have a healthy food system we need to have a collaborative approach that strengthens a healthier sector for the future rather than seeking to deny its existence.

WHAT NEEDS TO HAPPEN

Use local authority planning powers to prevent further proliferation of unhealthy fast-food outlets.

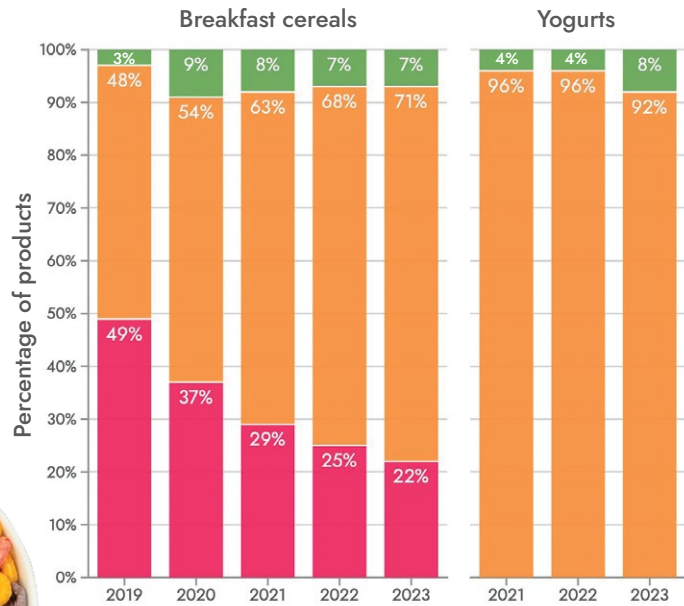


Availability of low sugar options in key children's food categories



Only **7%** of breakfast cereals and **8%** of yogurts marketed to children are low in sugar.

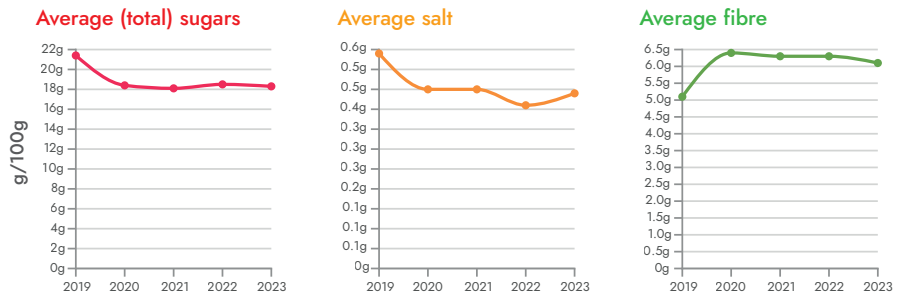
Percentage of breakfast cereals and yogurts marketed to children categorised as **high**, **medium** and **low** in sugar



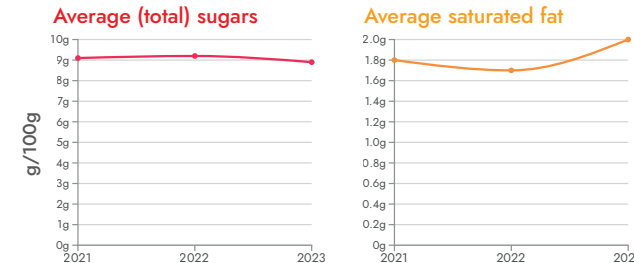
Source: Analysis by Action on Salt and Action on Sugar



Average nutrient content of breakfast cereals



Average nutrient content of yogurts



Source: Analysis by Action on Salt and Action on Sugar

On average, children in the UK consume double the recommended amount of sugar²⁸, contributing to two of the greatest health issues facing children in the UK: unhealthy weight and tooth decay. The abundance of cheap, commercially produced, high sugar foods drives these harmful dietary patterns. In contrast to foods like cake and confectionery, yogurt and cereal are foods that parents often give their children in the belief that they are part of a healthy diet, not expecting that hidden sugars are one of the main ingredients. However, Action on Sugar's annual surveys of yogurts and breakfast cereals marketed to children show only 7% of breakfast cereals and 8% of yogurts marketed to children are low in sugar. Incremental improvements in nutrient content have been seen each year but not on a scale sufficient to have any tangible impact on improving children's health. The volume of sugar and the sweetness of these products must be reduced so that parents can trust that the options available to them are not going to damage their children's health.

In recognition of the need for retailers and manufacturers to meaningfully shift their practice, the Government introduced a programme calling on businesses to voluntarily reduce the sugar content of their products. The final results were published last year and showed that sugar content of relevant products decreased by a meagre average of 3.5% from 2015 to 2020, falling far short of the Government's target of 20%²⁹. Breakfast cereals and yogurts were two categories with larger reductions at 14.9% and 13.5%, and despite improvements, many of these products remain far from healthy. The results challenge arguments that voluntary measures will be adequate to deliver the required change in industry practice.

Furthermore, a recent report revealed the majority of retailers are not actively assessing the volume of sugar they sell, let alone reducing it³⁰. This has sparked calls for tighter regulation on industry. The Food Data Transparency Partnership initiative (see next section on Business Reporting for further details) is an opportunity for retailers and manufacturers to demonstrate a commitment to improve their practice in this area.

WHAT NEEDS TO HAPPEN

Reformulate products with too much sugar and stop marketing unhealthy food to children.



HENRY DIMBLEBY,
AUTHOR OF THE NATIONAL FOOD STRATEGY
INDEPENDENT REVIEW

It is a complete fantasy to suppose that the huge problems of diet-related disease are going to be solved by voluntary measures. The commercial incentives for companies to produce food that makes us sick is overwhelming. Just look at the results of the voluntary sugar reformulation programme. Cereals and yogurts are a staple of many families' diets, and the huge levels of sugar still in so many products is shocking. We need to do better.

As a bare minimum, the Government must make the Food and Drink Transparency Partnership (FTDP) a vehicle for more transparency and action around healthier food sales. Mandatory reporting needs to be core to the FTDP process – if not the FTDP risks becoming yet another ineffectual voluntary framework.



Business transparency on sales of healthy and sustainable foods

Just **8** major UK food retailers, caterers and restaurant chains **currently report publicly** on sales of healthy foods, fruit and vegetables, or animal vs plant-based proteins.



Number of major UK food retailer, caterer or restaurant chains transparently reporting on sales of healthy foods, fruit and vegetables, or animal vs plant-based proteins

Reporting on: ■ All 3 metrics ■ 2 metrics ■ 1 metric ■ None of the 3 metrics

Retailers



Caterers and restaurant chains



0 2 4 6 8 10 12 14 16

Number of Businesses

Source: Analysis by The Food Foundation for Plating Up Progress

Food businesses are the gatekeepers to our diets and the main funnel through which most commercially produced food is channelled. Increased transparency around the types of food that businesses sell, with targets for boosting sales of healthy and sustainable foods, will be a critical step in expanding the availability of such foods. Over the past few years, food businesses have increasingly made commitments to support the transition to healthy and sustainable diets. While this is welcome, the pace at which commitments are being made across the food retail and service sectors is too slow, and there is a lack of consistency and transparency in the sales data disclosed. This means it is not always possible to accurately track progress or hold businesses to account.

The Food Foundation's *Plating Up Progress*³¹ benchmark assesses major UK-operating food retailers, caterers and restaurant chains against a series of health and environmental metrics. This includes gathering data on the number of businesses that are voluntarily reporting on three key indicators:

1. The percentage of sales that come from healthy foods
2. The percentage of sales that come from fruit and vegetables
3. The percentage of protein sales that come from animal vs plant-based proteins

These three metrics are critical for assessing industry progress in supporting citizens to access foods that support healthier and less environmentally damaging dietary patterns. Of the 11 retailers and 16 out of home businesses assessed for the project, currently just 1 (Sainsbury's) reports publicly on all three key metrics. An additional 7 businesses that were assessed are reporting on one or two of these metrics, while the

remaining 19 businesses that were assessed are only reporting partial data or none at all. Since 2022, there has been little to no progress in companies publicly reporting sales against these three key metrics.

There are also increasingly stark differences in the progress made by different types of food businesses. Voluntary reporting on sales is much more common practice among food retailers than it is among businesses in the out of home sector. A consistent set of metrics to enable mandatory reporting will be an important step towards being able to monitor the role of businesses in supporting the dietary transition towards health and sustainability, and incentivise businesses to invest in the data systems that are required to accurately track performance. In 2022, following a recommendation made in the independent *National Food Strategy*³², the Government committed to establishing a Food Data Transparency Partnership (FDTP), through which businesses, investors and other stakeholders would collaboratively design a mandatory business reporting process and establish a consistent set of health, environmental and animal welfare metrics to support greater business transparency. Although it is encouraging to see the FDTP commence work, it is disappointing that the commitment to mandatory reporting for health indicators has been dropped. Without this, the FDTP process risks becoming simply another voluntary framework that will fail to drive meaningful progress on progress and increase the reporting burden for companies by adding another voluntary reporting framework to those that already exist.

A number of food businesses are due to publish their corporate sustainability reports with updated commitments and data on progress between June and September 2023. The Food Foundation's forthcoming *State of the Food Industry* report will provide an updated review of corporate progress.



NILANI SRITHARAN,
GROUP HEALTHY & SUSTAINABLE
DIETS MANAGER, SAINSBURY'S

Health disclosures by the food and drink sector are an important driver of transparency, accountability and food systems change. By collecting and reporting on the healthiness of our sales, including the food group proportions in a typical basket, we have been able to identify our areas for action, track performance against our health targets and add 'healthiness' as a consideration within our commercial decision-making tools. Critically, we need more of the food and drink sector to do the same, not just to inform their own actions but to allow us to collectively improve the data insights to inform and evaluate future health policies.

WHAT NEEDS TO HAPPEN

Increase transparency around the types of food businesses sell, with targets for boosting sales of healthy and sustainable foods.

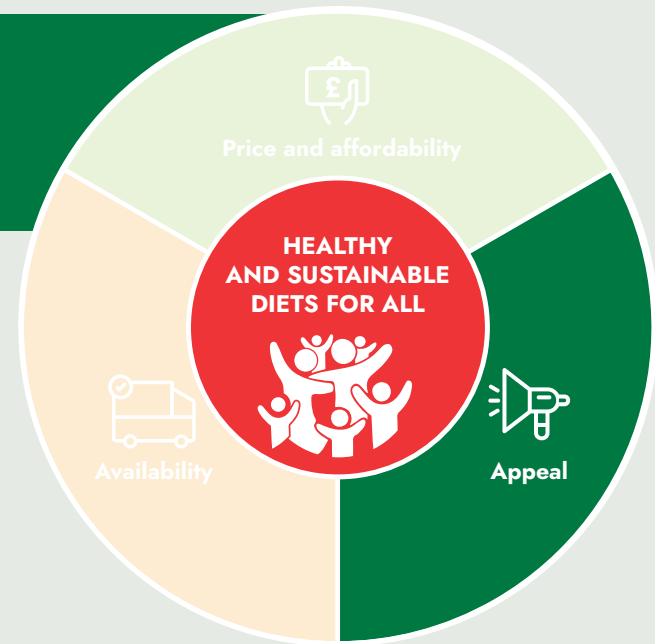




FOOD ENVIRONMENT METRICS

Appeal

Advertising and marketing influence people’s perceptions of foods and food brands, which in turn affect what and how much people eat. People are often unaware of how pervasive these tactics are and the extent to which they unconsciously drive them towards foods which can damage their health.



This section looks at two key metrics on appeal:


P24
 Marketing of baby and toddler snacks


P26
 Advertising spend on food

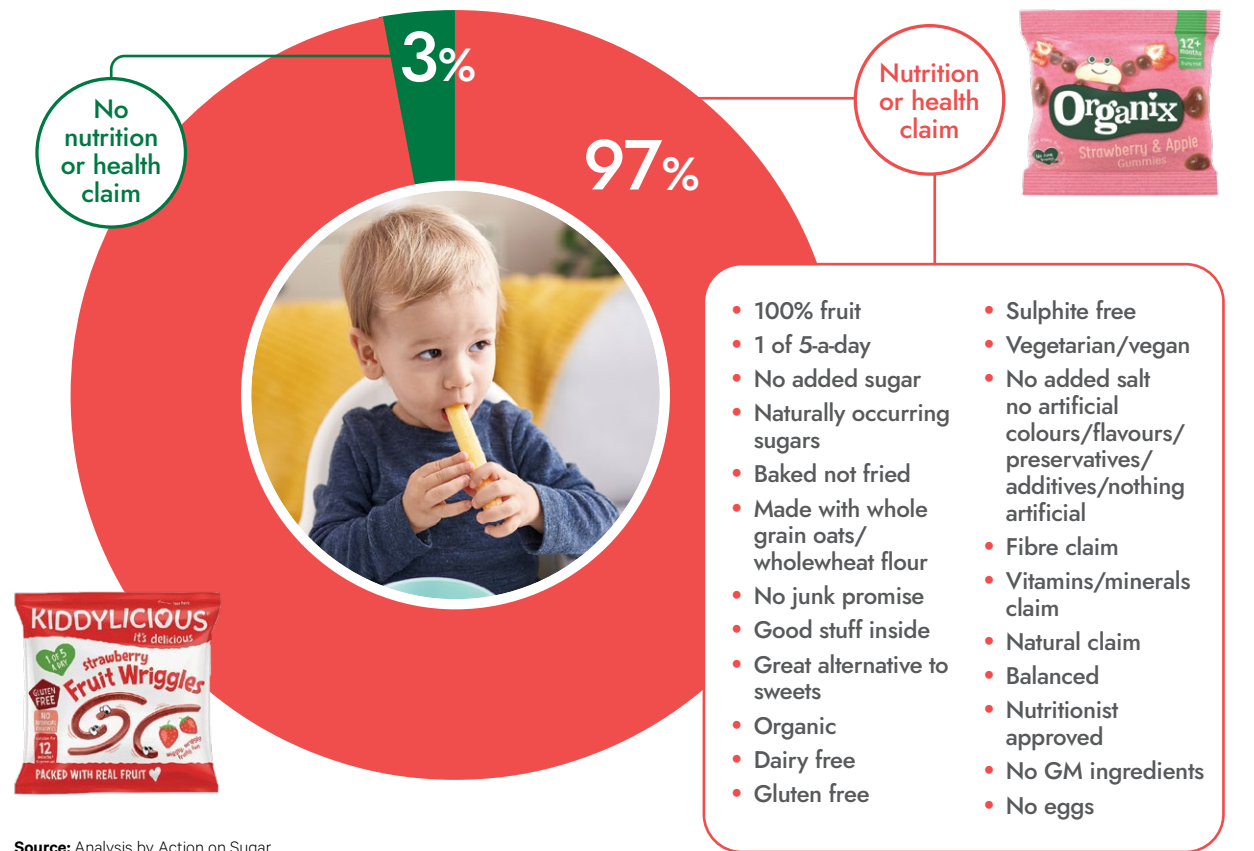


Marketing of baby and toddler snacks

97% of snacks marketed towards babies and toddlers feature a **nutritional or health claim** on the front of the packaging despite often being **high in sugar** for this age group.



Nutrition and Health Claims on front of packaging of snack foods marketed for babies and toddlers



Source: Analysis by Action on Sugar

The introduction of solids in the first year of life is pivotal in shaping a baby's relationship with food, affecting long-term taste preferences and eating habits³³. It is therefore essential to good dietary health that the food system supports children to have the best start in life.

A survey conducted by Action on Sugar has found that 97% of snack foods marketed as appropriate for babies and toddlers include a nutrition or health claim on the front of the packaging. The claims are wide ranging with over 20 different claims made across the products surveyed. These claims (such as organic, no added salt/sugar, no artificial ingredients) while factually correct, create a 'health halo' around these foods, despite often being high in sugar for this age group and snacks not being recommended for children under the age of one⁸³. Even when these foods contain 'no added sugars', they are often high in pureed fruit. Although sugar in whole fruit is not considered a health risk, the process of pureeing releases the sugars from their cells. These 'free sugars' are more harmful than in the whole fruit form and can contribute to tooth decay³⁴. Of the snack foods surveyed, 26% would provide half of the maximum recommended sugar intake for a 2-year-old in a single portion.* Furthermore, many of these products are marketed to children even younger than 2 years old. Even by definitions used for adults, only 18% of all the snack foods in the sample would be classified as low in sugar. Furthermore, a recent report by First Steps

Nutrition found that many of these types of food are ultra-processed⁸⁴. These findings are extremely concerning given that commercial infant snacks are widely consumed and considered by many families to be a normal part of children's diets³⁵.

Evidence shows that these marketing tactics are effective and mislead parents into thinking these commercial products are beneficial for their child and superior to homemade alternatives. In a separate public opinion survey by Action on Sugar, 83% of parents of a 1 to 3-year-old said they would choose fresh fruit as an alternative if ready-made baby and toddler snacks were not available³⁶, highlighting that the availability and marketing of these products are driving parents towards less healthy options.

The WHO recommends that all necessary measures should be taken to end inappropriate promotion of foods for infants and young children³⁷. In line with this, regulation is needed in the UK to prevent industry using health claims to promote these highly processed, high sugar foods.

* Calculations by Action on Sugar based on SACN 2015 recommendations for population aged 2 years and above for free sugars intake to not exceed 5% of daily calories. Calculation based on 932kcal per day for 2-year-old female. Sugar data are based on total sugars. However, most of the sugars in these products can also be classed as free sugars – sugars that are added or naturally present in honey, juices or syrups (but not sugars in whole fruit and vegetables or dairy).



DR CAMILLA KINGDON,
RCPCH PRESIDENT

The findings from this report highlight the need for urgent action from the UK Government to ensure all children and young people have the best start in life. Families want the best for their children but many parents I see in my clinical practice make the assumption that baby food pouches and pots are a better option than homecooked food – despite being invariably more expensive. The marketing strategies used on these parents are highly effective, with buzzwords such as 'all organic', 'natural sugars' and 'nutritionally approved', which is disingenuous at best and dangerous at worst. A key driver for the inappropriate marketing strategies is the lack of mandatory guidelines on the nutritional content of foods aimed at infants, which means there are currently no limits on how much sugar and salt these products should contain. This is concerning especially when we know over 1 in 5 children in England are starting school with excess weight.

The early years are a critical development stage for children, so the UK Government has a unique opportunity to address this and we urge them to immediately publish mandatory guidelines on the amount of sugar and salt that infant foods can contain. This would help prevent the misleading marketing of unhealthy toddler and baby foods.

WHAT NEEDS TO HAPPEN

Regulate marketing and composition of toddler and baby foods, and restrict nutrition and health claims on the front of packaging.



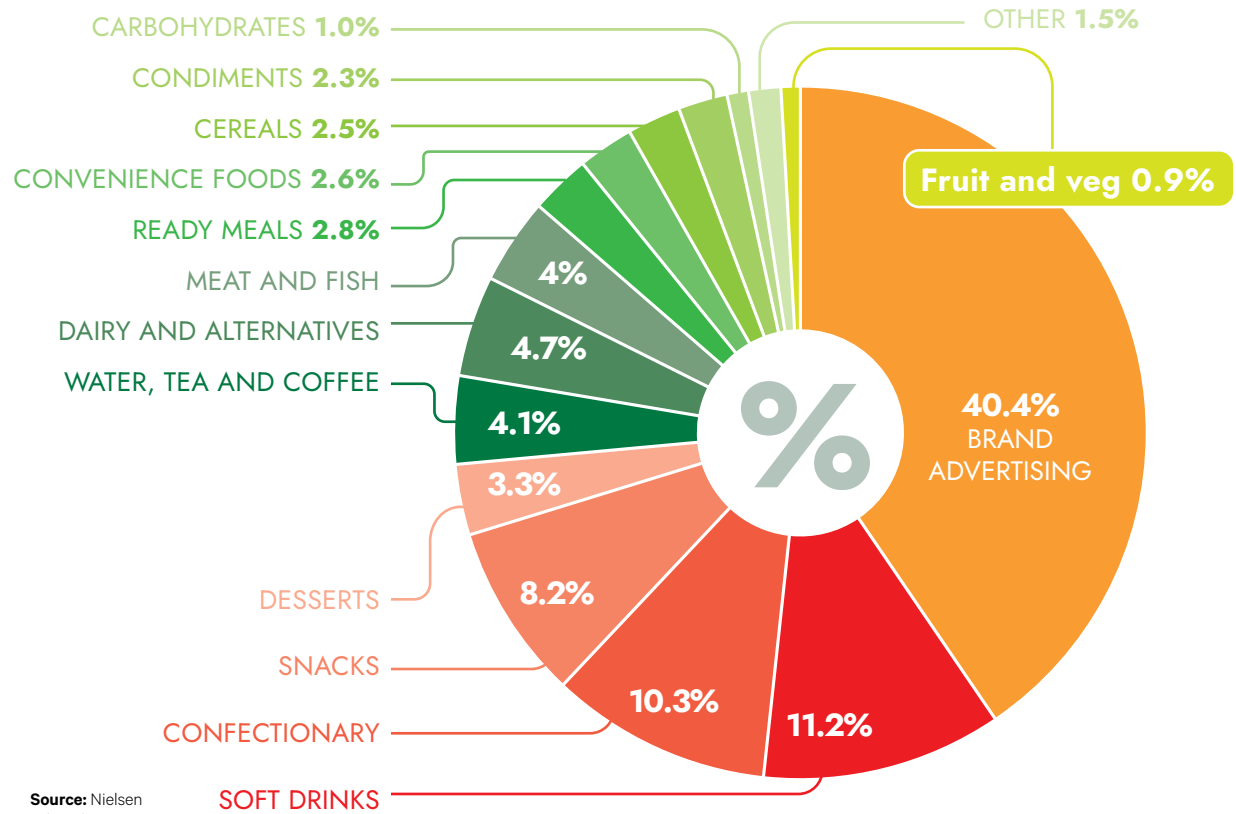
Advertising spend on food



A **third** (33%) of food and soft drink advertising spend goes towards **confectionery, snacks, desserts** and **soft drinks** compared to just **1%** for **fruit and vegetables**.



Proportion of advertising spend on different food categories



Source: Nielsen Ad Intel, 2022

Food and non-alcoholic drink companies invest a substantial sum in advertising. A disproportionate percentage of that sum is spent on marketing foods which are detrimental to the country's health. Our analysis of Nielsen data shows that in the UK in 2022, the amount spent on fruit and vegetable advertising was negligible (£10 million / 1% of total advertising spend on food and drink) in comparison to spend on discretionary food products such as soft drinks, confectionary, snacks and desserts (£360 million / 33% of total advertising spend on food and drink).*

Advertising significantly contributes to normalising unhealthy foods in society. People are often unaware of how advertising affects their decision-making and the industry's influence on their freedom of choice. Concerningly, children are particularly vulnerable to these marketing techniques, with scientific evidence showing that advertising can consistently and reliably influence children's food preferences and purchasing habits, driving up their calorie consumption^{38,39}. Moreover, people from lower socio-economic groups are more likely to be exposed to this advertising than those from higher socio-economic groups⁴⁰.

The UK Government acknowledged the harmful influence of advertising on health in their 2020 Obesity Strategy, and subsequently passed legislation to restrict advertising of high fat, salt and sugar (HFSS) food and drink online and on TV before 9pm. However, they have since delayed the implementation of these urgently needed policies until October 2025. These policies have the potential to be extremely effective; the Government's own assessment

predicts that the proposed restrictions will reduce levels of obesity⁴¹. Similarly, evaluations of a ban on advertising HFSS food and drink across the Transport for London network showed that advertising restrictions successfully reduced calorie consumption⁴².

These measures are not only potentially effective through influencing individual choices; they also push manufacturers to reformulate HFSS products, motivate them to expand portfolios to include more healthy options, and encourage companies to invest resources in driving up sales of healthy food. However, there are also concerns that there are loopholes in these restriction policies. Companies can potentially circumvent restrictions on advertising of HFSS products by advertising their brand rather than a specific food or drink. Our analysis shows that £441 million (40% of total food and non-alcoholic drink advertising spend) was spent on brand advertising in 2022. Brands with high percentage HFSS food sales are often associated by citizens with HFSS foods regardless of whether such a product is being advertised, which could undermine the potential impact of restrictions.

To make a meaningful impact on preventing excess consumption of HFSS by children, reducing childhood obesity, improving lifelong food preferences in children, and therefore improving long-term health and wellbeing, industry will need to enter into the spirit of the regulations and not take advantage of loopholes.

*Digital advertising forms an increasingly significant proportion of total advertising spend which is not captured in these data.



WHAT NEEDS TO HAPPEN

Increase advertising spend on healthy foods and decrease advertising spend on less healthy foods.

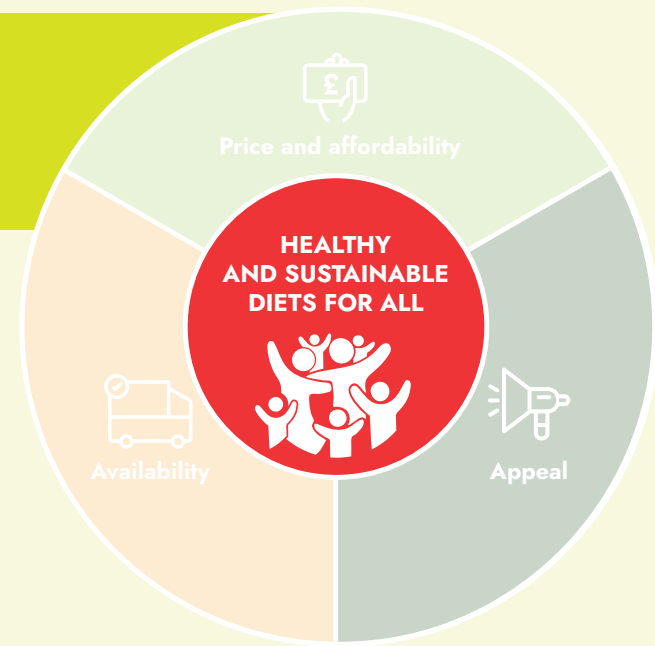




OUTCOME METRICS

Diet quality

The affordability, availability and appeal of healthy foods relative to unhealthy foods create the food environments which influence what people choose to eat. The quality of diets in the UK is therefore reflective of whether the food system is set up to support citizens to eat healthily and sustainably.



This section looks at two metrics indicating diet quality across the UK



P30
Nutritious food consumption



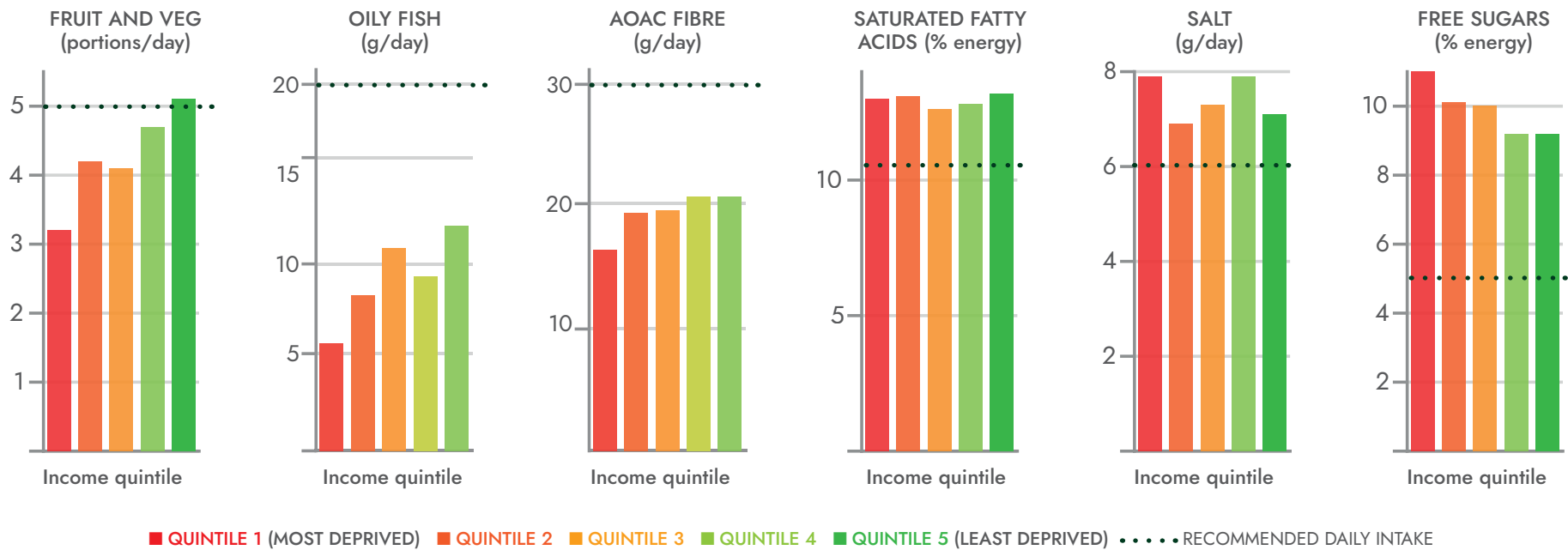
P32
Ultra-processed food consumption



Nutritious food consumption

The **most deprived fifth** of adults consume **less fruit and veg** (37% less), **oily fish** (54% less) and **dietary fibre** (17% less) than the least deprived fifth.

Nutritional intake by quintile of deprivation



Source: Analysis of the National Diet and Nutrition Survey.

The food consumed by the majority of adults and children in the UK does not currently meet requirements for a nutritious diet. Most adults and children consume in excess of maximum recommended intakes for sugar, saturated fat and salt, and do not meet recommendations for fruit and vegetable, fibre or oily fish consumption. The food environment metrics outlined in this report demonstrate why diets on average are so far short of what is needed for good health: in essence because the food system in the UK is not set up to support us to eat a healthy diet, and even less so for those with limited financial means.

Although failure to meet recommendations is seen across the whole population, there are significant dietary inequalities, and the most deprived people living in the UK eat poorer quality diets overall. These differences are most pronounced in relation to healthy categories such as fruit and vegetables, oily fish and fibre, of which more deprived groups consume less. For example, the least deprived fifth of adults on average meet the recommended intake of 5-a-day, but the most deprived fifth consume just 3.2 portions of fruit and vegetables per day. Similarly, the most deprived fifth consume less than half the quantity of oily fish that the least deprived fifth do.

Consumption of less healthy foods shows less distinct socio-economic patterning. There is no statistically significant difference in salt and saturated fat consumption by level of deprivation, and although differences in sugar intake are statistically significant, there is less than a two percentage point difference in contribution to total calorie intake between the most and least deprived fifth.

These findings highlight the need for policy change to decrease intake of unhealthy food across the whole population, and additional measures to increase the affordability and availability of healthy food specifically for lower income groups, to remove the barriers to achieving a healthy diet.



TIM GARDAM,
CHIEF EXECUTIVE OF THE NUFFIELD FOUNDATION

The Nuffield Foundation is proud to have been the Food Foundation's start-up funder and to have supported the Broken Plate for its first five years. The Food Foundation has changed the terms of the public policy debate on food poverty in Britain. Its sense of purpose and energy are grounded in its rigorous analysis of data which gives its research authority and impact.

The trends in this year's Broken Plate's metrics demonstrate why its analysis is of increasing importance. In my foreword to 2021's Broken Plate I took issue with the frequently cited mantra of the pandemic: 'We're all in this together'; it remains the case that, in many different ways, we are not.

The cumulative pressures that have grown out of the pandemic and burgeoned into the cost-of-living crisis are clearly making life extremely difficult for a significant proportion of our society.

We note in particular The Food Foundation's new metric which shows that, although challenges in achieving a healthy diet are population wide, the link between income and dietary inequalities remains entrenched.

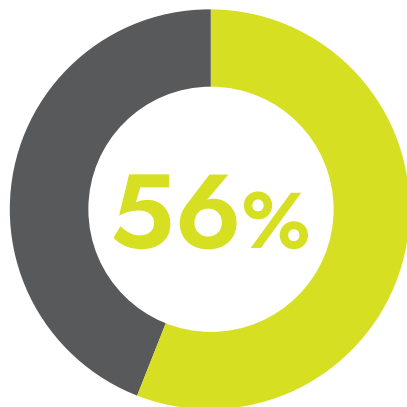
Two years ago, we were looking forward to publication of part two of the National Food Strategy. Reading this year's Broken Plate it's clear that opportunities for interventions that would bring lasting benefits for public and private health and the quality of people's lives are being missed. The Food Foundation once again makes the case that improving our food system is a fundamental building block for the country's future wellbeing.



Ultra-processed foods consumption

56% of calories consumed by older children and adults are from **ultra-processed foods**.

Proportion of calories consumed from ultra-processed foods by older children (11+) and adults

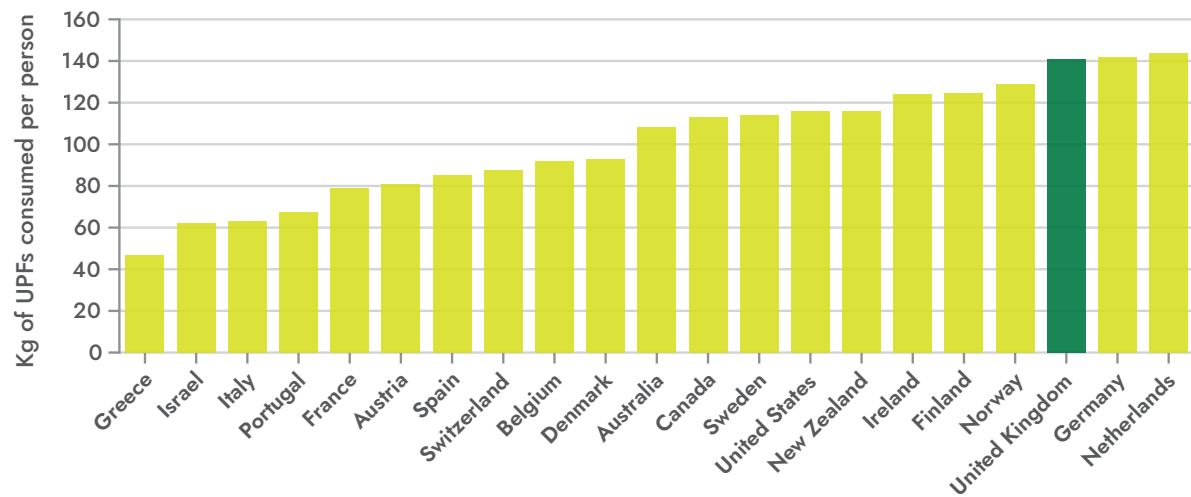


Source: Madruga, M., Martínez Steele, E. et al. (2022). Trends in food consumption according to the degree of food processing among the UK population over 11 years. British Journal of Nutrition.



Ultra-processed food consumption per person in 2016

INTERNATIONAL COMPARISON



Source: Vandevijvere et al., 2019. Global trends in ultraprocessed food and drink product sales and their association with adult body mass index trajectories.

Drastic increases in consumption of ultra-processed foods (UPFs) in recent years – linked to parallel rises in rates of obesity and other chronic dietary diseases⁴⁴ – have caused them to become an increasing area of concern for the public, policymakers and health professionals. Various studies have shown that UPFs now account for a significant proportion of food eaten in the UK. One study estimated that over half (56%) of calories eaten by older children (11+) and adults are from UPFs⁴⁵; another found that the proportion of calories eaten at lunch at school (whether prepared by school or at home) that was ultra-processed was 73% in primary school and 78% in secondary school⁴⁶. Even among children aged approximately 21 months, a recent study estimated UPFs accounted for 47% of calories⁴⁷. Furthermore, UPF intake in the UK appears to be higher than in many other countries⁴⁸, leaving UK citizens particularly vulnerable to the potential damaging health impacts.

UPFs are foods that have undergone industrial processing and formulation using manufacturing processes that aren't replicable with homemade food and often involve the addition of additives, preservatives and other artificial ingredients. These foods are often designed for convenience, long shelf-life, hyper-palatability and affordability; but tend to be energy-dense and high in salt, sugar, fat and additives while lacking in fibre and micronutrients.

The significance of the substantial increase in production and consumption of UPFs is its association with the increased risk of many conditions, including but not limited to obesity, type 2 diabetes, hypertension, cardiovascular disease, depression, cancer and stroke. This link has been demonstrated by a considerable number of academic studies⁴⁹. However, more research is needed to prove causation, better understand the mechanisms of action and identify policy implications.

The environmental impact of UPFs is also debated, with some studies showing that UPFs have 30-50% higher greenhouse gas emissions than homemade equivalents, but others suggest that they may reduce food waste due to their extended shelf lives⁵⁰. In addition, plant-based milk and meat alternatives, while generally considered to be better for the environment than meat and dairy, would mostly be classified as UPFs, while meat and dairy, the largest food group contributors to climate change, are not.

Specific UK policies are designed to regulate the food industry focus on restricting foods that are high in fat, salt or sugar (HFSS), rather than those categorised as ultra-processed. Further research is needed into the mechanisms causing the strong links between UPFs and poor health outcomes: this evidence should have a material impact on whether reformulation of existing products or more fundamental dietary shifts would achieve the health gains which are so urgently needed.



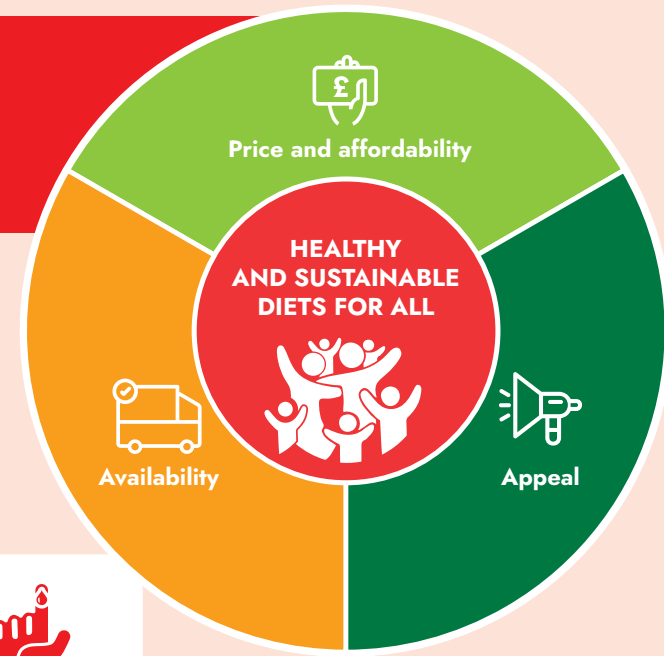




OUTCOME METRICS

Health outcomes

Inadequate nutrition resulting from poor food environments has implications for the health of children and adults, wider society and the planet. The economic impacts of these health outcomes are then explored.



This section looks at five key metrics on health outcomes:



P36
Children's dental decay



P38
Children's growth



P40
Children's weight



P42
Healthy life expectancy



P44
Diabetes-related amputation

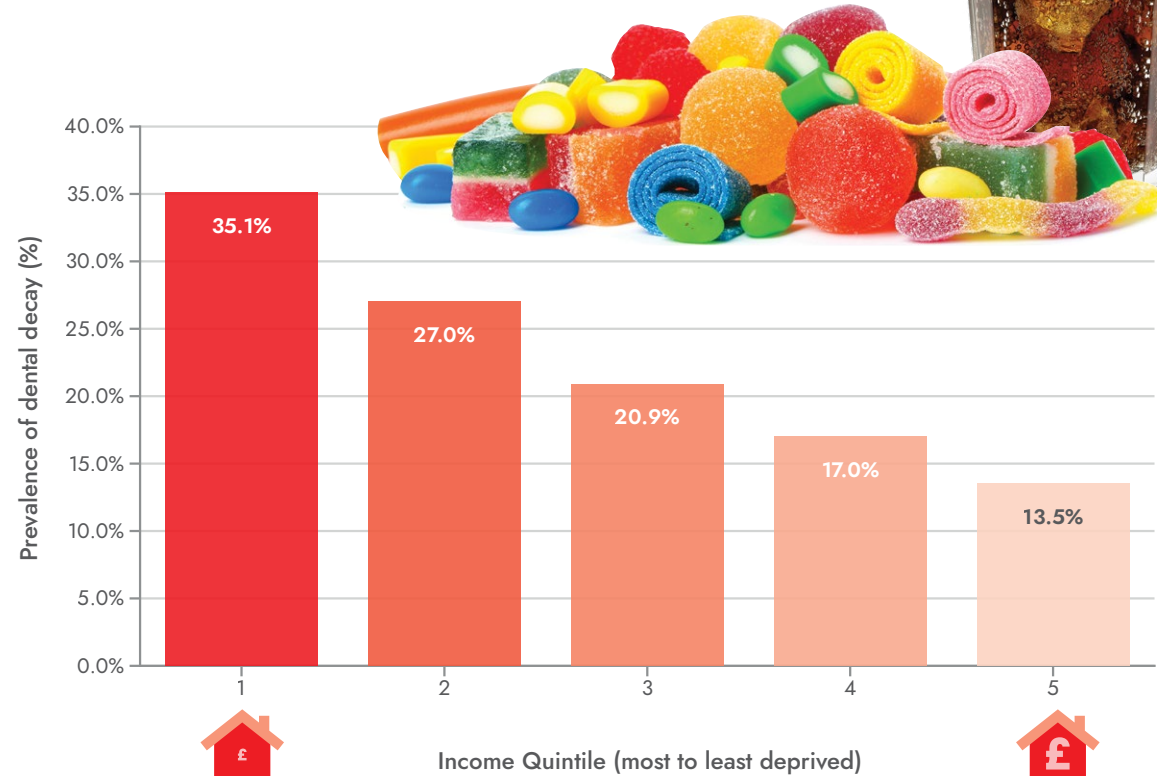


Children's dental decay

Almost a **quarter** (24%) of **5-year-olds have dental decay**, with **2.5** times as many children in the **most deprived** fifth affected compared with the **least deprived** fifth.



Prevalence of dental decay among 5-year-olds by income quintile



Source: Oral health survey of 5 year old children 2022, OHID

Dental conditions can impact on children's ability to eat, talk, play and learn, as well as their self-esteem and quality of life⁵¹ and yet dental decay is often overlooked as a serious consequence of poor diet. A highly prevalent condition among even young children, 24% of children aged 5 show dental decay. Once again there are large inequalities, with the most deprived fifth of 5-year-olds being 2.5 times as likely to be affected as children in the least deprived fifth⁵².

This is not a trivial problem. In fact, tooth decay is the leading cause of admission to hospital for 6 to 10-year-olds⁵³. This largely preventable condition forces the NHS to spend over £50 million per year on tooth extractions⁵⁴. The dentistry system in the UK is overwhelmed and, according to the British Dental Association, 8 in 10 practices are not accepting new child patients due to being at maximum capacity⁵⁵. Furthermore, dental issues are a significant cause of absenteeism from school and work, affecting children's learning and wider productivity⁵⁶.

“ Decreasing children's sugar intake and improving access to a healthy diet are therefore critical elements of prevention of dental decay ”

Alongside other factors such as exposure to fluoride and access to dental care, high sugar intake is a key factor in the development of dental decay. Furthermore, studies have shown a significant association between food insecurity and dental decay, indicating that diet is also a factor driving the inequalities seen in dental decay rates⁵⁷. Decreasing children's sugar intake and improving access to a healthy diet are therefore critical elements for preventing dental decay. In light of these statistics, the Association for Directors of Public Health recently coordinated a letter supported by several dentistry organisations urging Government to impose further restrictions on sugary food and drink, and improve access to affordable, healthy food to improve dental health⁵⁸.





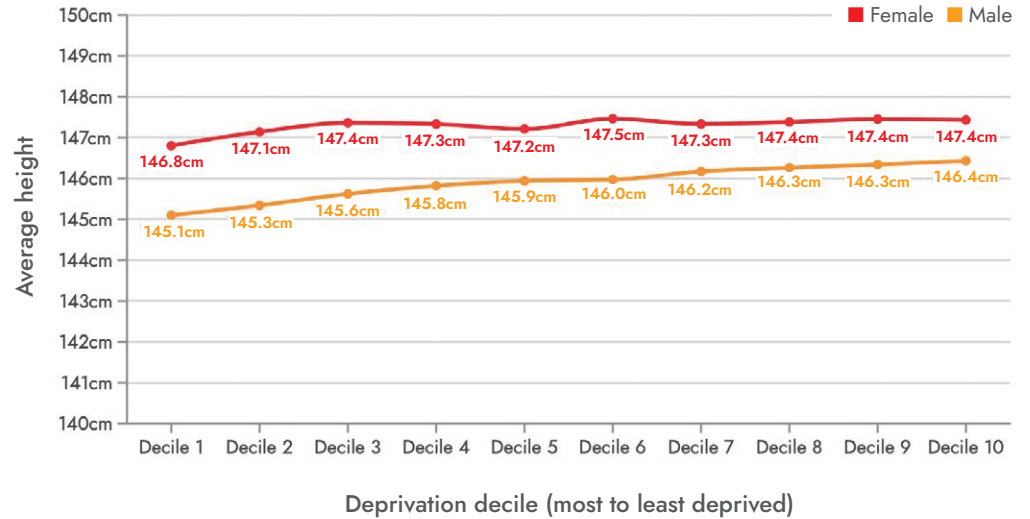
Children's growth

Children in the most deprived tenth of the population are on average up to **1.3cm shorter** than children in the least deprived tenth by **age 10–11**.



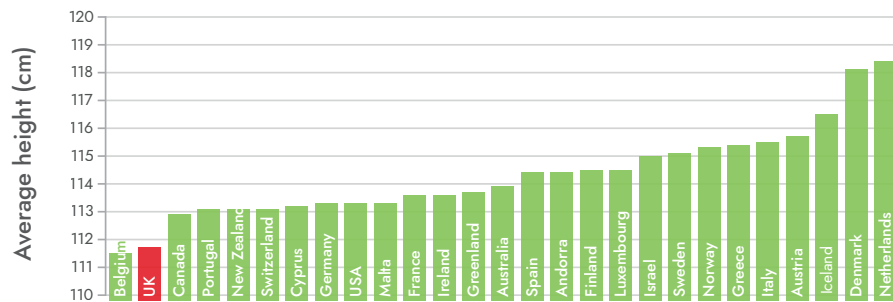
Average height of White British children age 10-11 by deprivation group
2021/22

Source: National Child Measurement Programme 2021/22, OHID



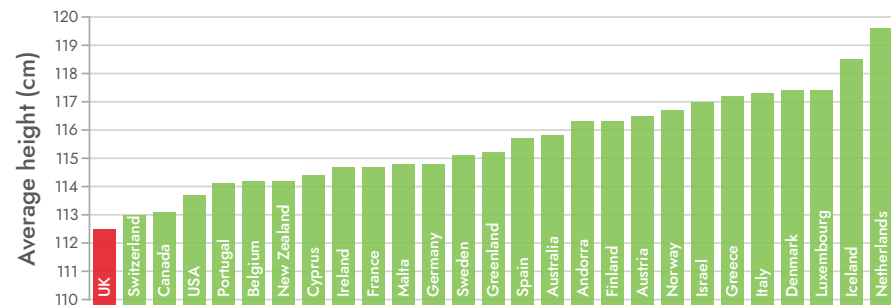
INTERNATIONAL COMPARISON

Average height in high income western countries: **female, aged 5, 2019**



Source: NCD-RisC

Average height in high income western countries: **male, aged 5, 2019**



Consistent with the findings from previous *Broken Plate* reports, analysis of the Government's National Child Measurement Programme 2021/22 shows that White British children living in the most deprived areas in England continue to be shorter than those living in the least – 0.6cm for girls and 1.3cm for boys. (The same pattern is not apparent for children of black ethnicity and further exploration is needed to elucidate these differences.) Similarly, an academic study of data collected from 2006 to 2019 found that the prevalence of short stature was almost twice as high in the most deprived tenth of children compared with the least⁵⁹.

“ *Suboptimal nutrition during the critical development period of childhood can have lifelong implications.*”

There are several factors that contribute to a child's height that cannot be altered (such as genetics), alongside modifiable environmental factors such as diet. Not reaching full growth potential is widely understood to be an impact of poor nutrition in low income countries, but diet is often overlooked as a determinant of the height of children in the UK. International data show that children in the UK are on average shorter than those in nearly all other high income countries by age 5⁶⁰.

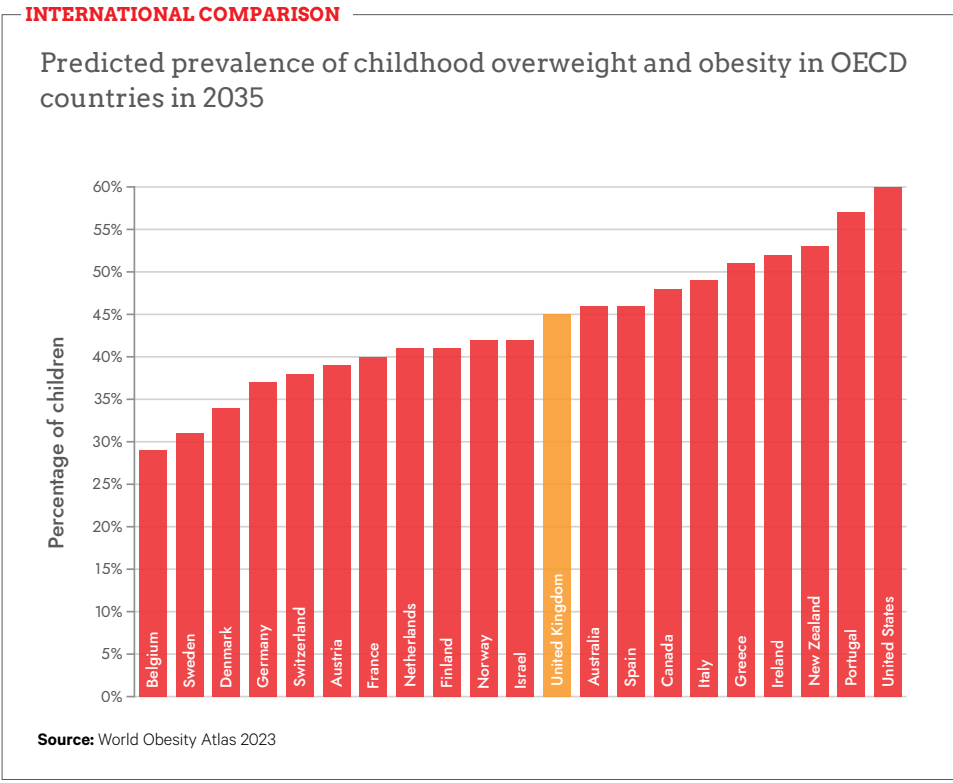
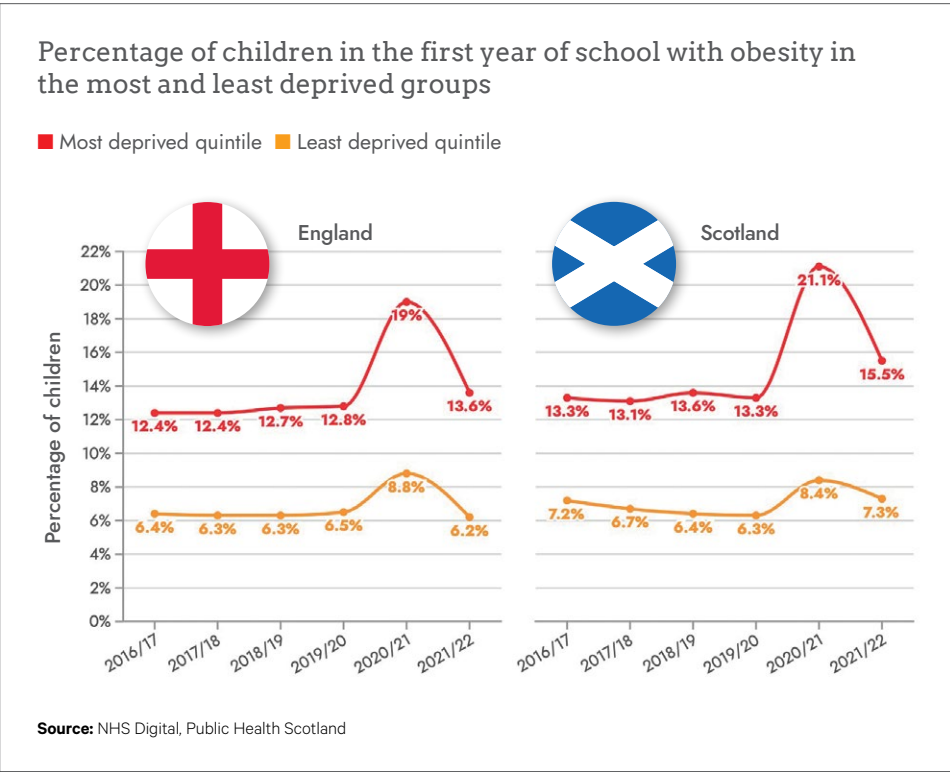
While being shorter is not necessarily in itself a concerning health problem, at a population level it is indicative of poor nutrition impacting on growth and development of the child as a whole. Suboptimal nutrition during the critical development period of childhood can have lifelong implications.





Children's weight

Children in the most deprived fifth of the population are over **twice as likely to be living with obesity** as those in the least deprived fifth by their first year of school



Across England and Scotland, children living in the most deprived fifth of the population are more than twice as likely to experience obesity by their first year of school compared to the least deprived fifth⁶². Numbers of children living with overweight and obesity have decreased from the sharp spike that was seen during the Covid-19 pandemic, but remain concerningly high. The decrease observed in the past year is most likely due to a return to normal following the pandemic and is unlikely to continue along this trajectory without further intervention.

The deprivation gap in obesity levels clearly illustrates that any action to improve the health of our children will not be effective if it does not directly tackle these inequalities and help the poorest children in society to eat well. Although considered by some to be paradoxical, obesity and food insecurity often co-exist due to the affordability of cheap, high calorie foods. Families on low incomes are often reliant on these to feel full and are less able to afford the foods required to prevent nutritional deficiencies. The food system is not designed to help anyone eat healthily, but it makes healthy eating even harder for those on low incomes. Much lower levels of obesity are seen in the most affluent groups, but childhood obesity remains a problem across all socio-economic groups. Policies must therefore seek to address all the drivers of obesity with a particular focus on addressing the challenges of eating a healthy diet for people living on a low income, in order to reduce the stark inequalities.

While rates of child overweight and obesity in the UK are not the worst, many other OECD countries are succeeding in keeping levels lower. The UK Government's target to halve child obesity by 2030 shows recognition of the importance of protecting children's health, but urgent re-assessment of the approach to tackle this problem is needed to achieve this target.

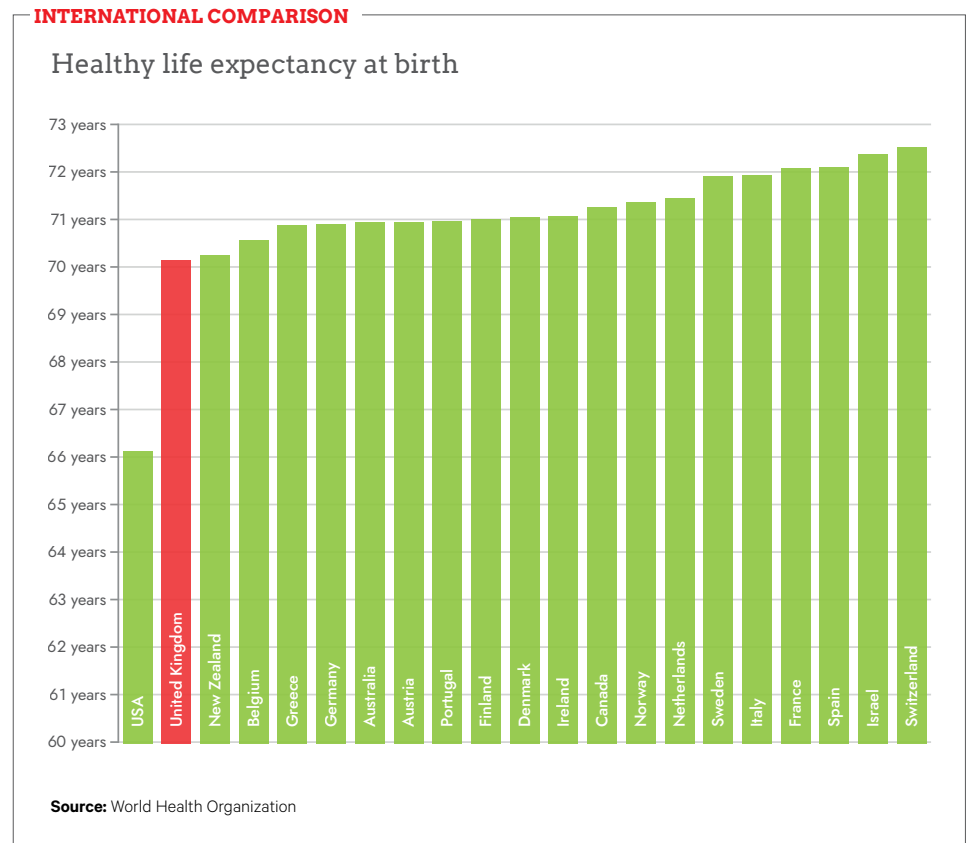
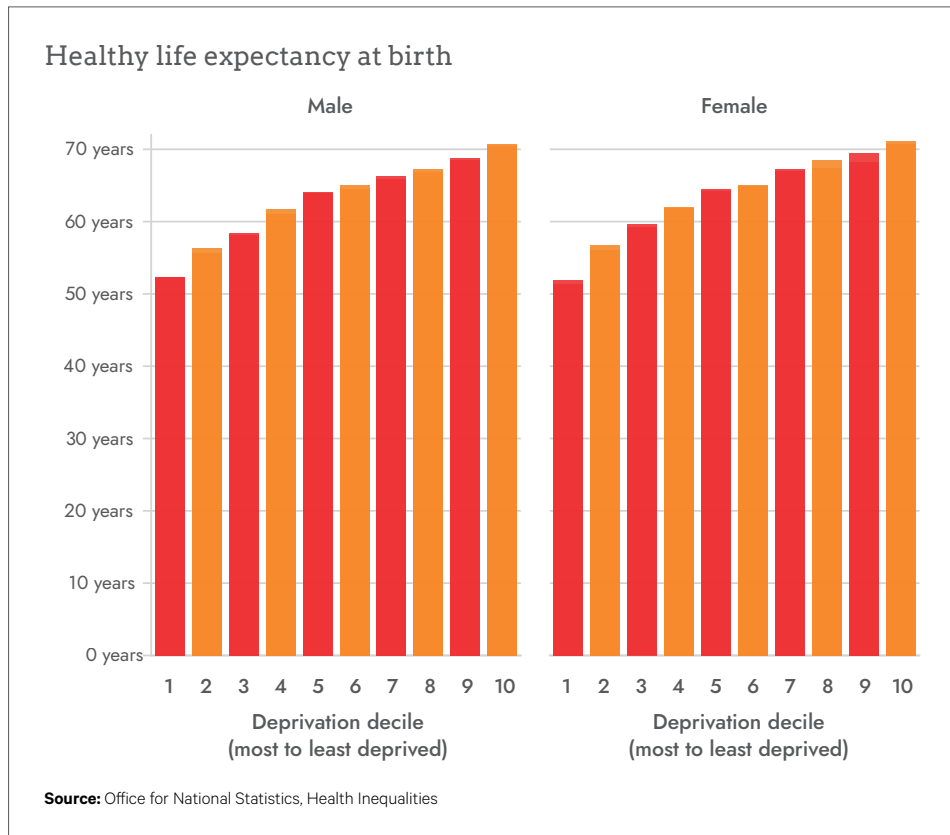
“The food system is not designed to help anyone eat healthily, but it makes healthy eating even harder for those on low incomes.”





Healthy life expectancy

Healthy life expectancy in the **most deprived** tenth of the population is **19 years lower for women** and **18 years lower for men** than in the least deprived tenth.



Healthy life expectancy at birth is a measure of the average number of years babies born this year are predicted to live in a state of ‘good’ general health. It provides an estimate of not merely how long people will live, but how long people will live without health issues lowering their quality of life. Dramatic inequalities in healthy life expectancy across deprivation groups remain according to most recent government data, with no significant improvement in recent years. Women in the most deprived tenth of the population can expect to live 19 fewer years of life in good health than the least deprived tenth, and similarly men experience an 18-year difference on average⁶³.

Perhaps as one of the most important indicators of population health, it is concerning that the UK lags behind the majority of other OECD countries, with only US citizens faring worse⁶⁴. The Government’s Levelling Up agenda offered hope that Government would be taking steps to reduce these substantial inequalities⁶⁵, but a comprehensive strategy for achieving this target has yet to materialise.

A wide range of economic and social factors contribute to overall population health, of which diet is a major factor. In fact, four of the top five risk factors for ill health in England could be improved through dietary changes⁶⁶. Addressing the factors laid out in this report will be crucial in helping to close the gap in healthy life expectancy between the most and least deprived, and ensuring that all individuals have the opportunity to live long, healthy and happy lives.



“**Four of the top five risk factors for ill health in England could be improved through dietary changes**”



JO BIBBY,
DIRECTOR OF HEALTH AT THE HEALTH FOUNDATION

We would all wish for a long, healthy life but, as these data show, this aspiration is more likely to be realised for some than others. Living in the most deprived groups in the UK means both a shorter life and more of it being spent in poor health.

The stark 19-year difference in healthy life expectancy between women in the most and least deprived deciles shows that not everyone in the UK has the necessary building blocks for a healthy life – an adequate income to provide for themselves and their families; housing that is affordable and secure; neighbourhoods that support active lifestyles with the right amenities and services.

While these data aren’t new, they represent a growing urgency for action. The impact of poor health goes much wider than its consequences for an individual’s wellbeing. Less than half of the population is reaching retirement age in good health, limiting their ability to participate in the labour market and ultimately acting as a brake on economic recovery.

Turning this around is a whole-society challenge. Yes, Government has a critical role in investing in services and infrastructure. But that is only half the story. Businesses also need to understand the impact they have on health – both the health of workforce through their employment practices, as well as on the health of their potential workforce through the products and services they provide. Employing over 13% of the UK workforce and reaching every home in the UK, perhaps the food sector can lead the way?

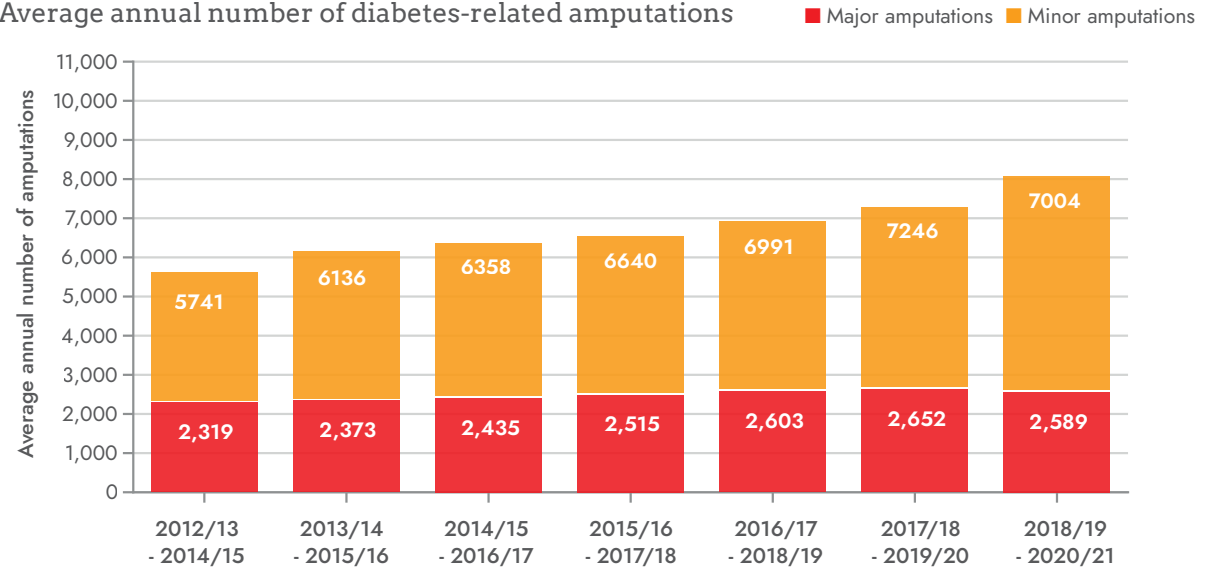


Diabetes-related amputations

Nearly **9,600** diabetes-related **amputations** are carried out on average per year – an **increase of 19%** in six years.

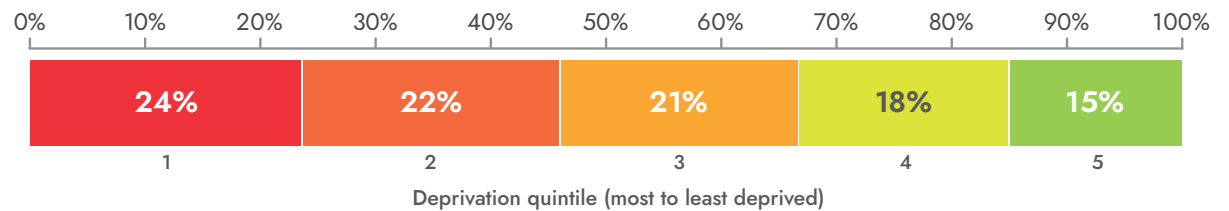


Average annual number of diabetes-related amputations



Source: Diabetes Foot Care Profiles, Office for Health Improvement and Disparities

Proportion of all people with type 2 diabetes by each deprivation group



Source: NHS Digital, National Diabetes Audit 2022-23

Lower limb amputations are one of several severe complications of diabetes mellitus alongside cardiac arrest, stroke, retinopathy and nephropathy⁶⁷. Characterised by an inability to effectively regulate blood glucose levels, diabetes causes damage to blood vessels and consequentially deprives nerves of oxygen. Over time, this leads to infections and tissue death, which can ultimately result in the need for amputation to prevent mortality.

On average per year from 2018/19 to 2020/21, there were 9,593 amputations carried out in English hospitals due to diabetes – a small decrease of approximately 3% compared with the previous year (up 19% in six years)⁶⁸. Up to this year, diabetes-related amputations had been consistently increasing year on year. A possible theory for this altered trajectory is pandemic-related disruption reducing the number of surgical operations carried out during the height of the Covid-19 crisis⁶⁹, as opposed to an improvement in the condition. The prevalence of diabetes itself has continued to rise, with Diabetes UK now estimating that approximately five million people in the UK are living with the condition⁷⁰, putting them at risk of traumatic complications. People in more deprived groups continue to be at higher risk of developing diabetes⁷¹.

Importantly, type 2 diabetes and related complications are entirely preventable. Genetic predisposition plays a role but obesity accounts for 80-85% of the overall risk of developing diabetes⁷². Therefore, food environment transformation could make a meaningful difference to reversing these numbers.

“ We cannot hold people personally responsible for their diet if we do not create realistic choices ”



LORD JAMES BETHELL,
CONSERVATIVE PEER IN THE HOUSE OF LORDS

The horror of amputation runs deeply in the human soul. But for some people, the grip of their unhealthy eating is so fierce, such a demon, that they cannot fight it, even though it might lead to the loss of a limb. Diabetes is now the biggest cause of lower limb amputations, and the numbers remain incredibly high: almost 10,000 last year. Each one is a tragedy. Many of them are avoidable – that's why we need to change the food cycle in the UK drastically. Few people want to be overweight or obese, and no one wants to lose a limb. But we cannot hold people personally responsible for their diet if we do not create realistic choices, a healthy environment, a positive culture and a supply chain to match. This report is so powerful because it spells out the steps necessary to put Britain back on course to being the healthiest country in the world and end the tragedy of these amputations.

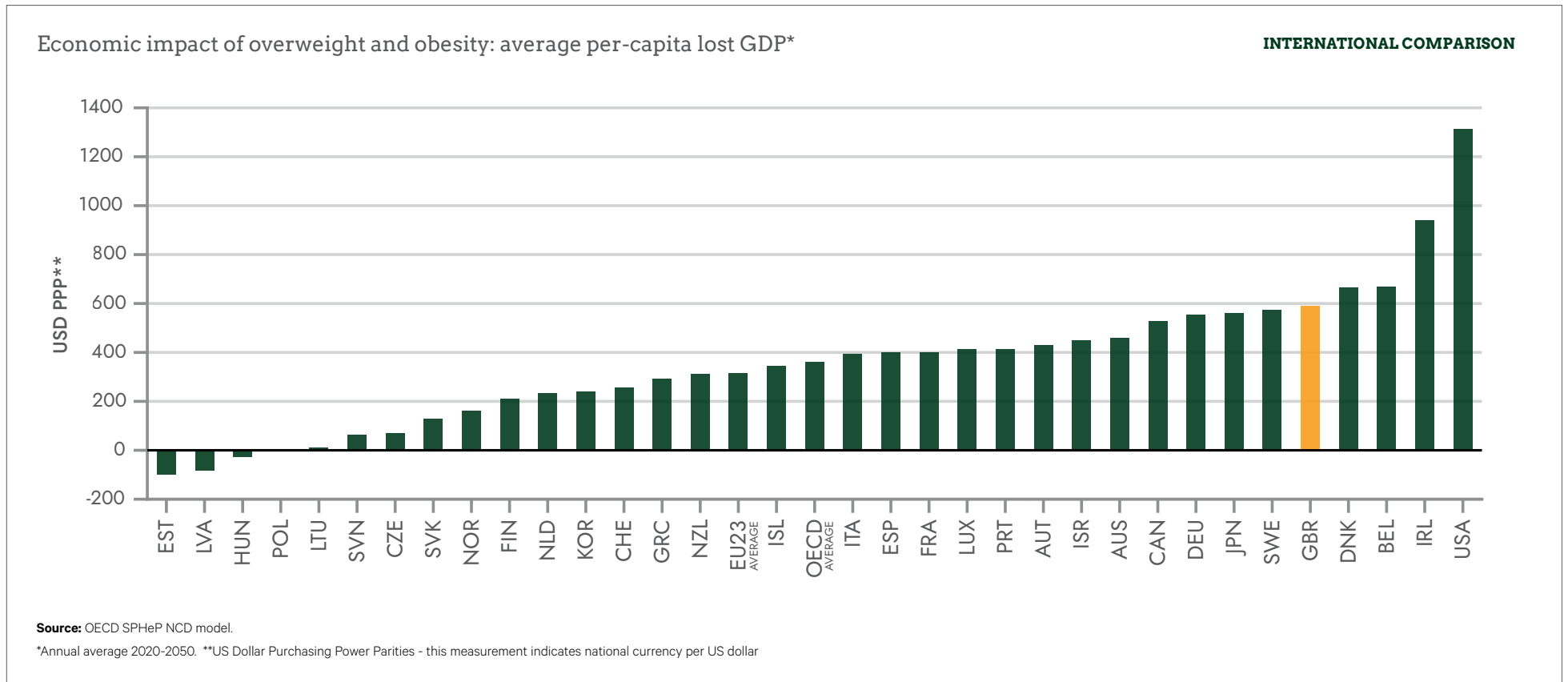
Economic impact of unhealthy diets



Failure of policy to address obesity does not only affect individuals. Treating obesity and related conditions has a significant impact on already overstretched health services and absorbs a significant proportion of NHS spending. In 2020/21, out of a total of nearly 13 million hospital admissions in England, over one million had obesity as a factor⁷³.

Indirect economic consequences of obesity arise through negative impacts on the labour market. A recent report found that areas of the country with the highest GDP per person had the lowest rates of overweight and vice versa⁷⁴. The IPPR also reported 2.5 million people are economically inactive due to long-term health issues, a portion of which have strong links to diets. The UK was the only G7 nation where the employment rate had not recovered to pre-pandemic levels⁷⁵. This impact is further illustrated by OECD research showing obesity reduces the employment rate, and increases early retirement, absenteeism and presenteeism resulting in a reduction in labour market outputs by the equivalent of 944,000 full-time workers per year in the UK⁷⁶.

Combined, the healthcare spending and impacts on the labour market of overweight and obesity cost the UK £74 billion every year and reduce GDP by 3.4% – equivalent to £409 lower per capita GDP⁷⁷. Furthermore, the UK is more greatly impacted than several other countries of similar socio-economic status⁷⁸. There are, therefore, significant savings to be made from tackling obesity.



Policies to tackle population-wide obesity therefore offer an opportunity not only to benefit individuals, but to deliver huge economic gains for the nation. For example, four recently implemented or planned obesity prevention policies (location- and volume-based restrictions on advertising, online advertising restrictions and the introduction of a watershed on TV; and the Soft Drinks

Industry Levy) have been estimated to generate a net return to the UK economy of £76 billion over 25 years⁷⁹. Similarly, a cost-benefit analysis found that expanding Free School Meals to all children would deliver benefits of £99.5 billion over 20 years in savings to schools, increased lifetime earnings, savings to the NHS and savings on food costs of families⁸⁰.

If Government is serious about economic growth, it must commit to improving diets and preventing obesity-related disease. This would help families lead healthier lives, increase economic productivity and reduce the burden of ill health on the NHS.

Conclusion: Feeding our country's potential

The findings from the report show us that too often people do not have the financial resources to buy the food they need, the food that is available is not nutritionally adequate, and the food that is marketed to us is detrimental to our health. The odds are stacked against us. The widening of health inequalities due to the impact of our food environments is undermining our nation's strength and resilience, and is generally worse than many other comparable countries. Our diets are weakening our health, our educational achievement, our labour force, our economy, our healthcare system, our environment and our wellbeing. To resolve this, we need to reorientate the food system and shift our food culture so the healthiest options are affordable, available and appealing. Only with these changes can we ensure that everyone, regardless of income or background, can eat nourishing food that promotes health and wellbeing and delivers wider societal benefits.

Beliefs that developing obesity is a personal failure and that responsibility for improving the nation's health lies with individuals are simplistic, out of touch and not evidence-based. The metrics in this report demonstrate how the food environment restricts and manipulates our choices. Increasingly it is being recognised that social and commercial determinants of health are in fact much

greater drivers of poor diets than lack of knowledge. Rather than 'nannying' citizens, government intervention to improve food environments can empower people to make genuine choices. Such interventions would help prevent the need for more invasive and drastic measures like weight loss surgery or lifelong appetite-suppression medication. The spectacular failure of policy after policy focused on individual responsibility⁸¹ shows that policies to transform our food environments (by increasing the affordability, availability and appeal of healthy food) offer a much smarter approach for policymakers seeking to improve the nation's health.

The food system has changed before and it can change again. A better system is within our reach if everyone chooses to make it happen. We all have a role to play in creating the country in which we want to live, and in creating the food system we want to feed us – from policymakers to food businesses, local authorities to investors and citizens. We need strong leadership to move us towards a shared vision of a better food future.

The upcoming election is an important opportunity for policymakers to rise to the challenge and step up their ambition. By recognising the importance of the food system in shaping our nation and its power to improve our health and wealth, they can carve a path towards a future where food is a source of positivity and prosperity for all.



APPENDIX: METHODS IN SHORT

This section provides a brief overview of the sources and methods used to calculate each metric in the report. Further details on the methodologies can be found in the *Broken Plate Technical Report*, available from The Food Foundation's website.

AFFORDABILITY OF A HEALTHY DIET

The estimated cost of the Eatwell Guide (£7.48 per day) was based on a 2016 optimisation modelling study undertaken by researchers at the University of Oxford combined with updated price data collected from online supermarkets in May 2022. The aim of the 2016 work was to identify a diet that meets the dietary recommendations with the least deviation from the current, average diet. This estimated cost of the Eatwell Guide diet was then adjusted for inflation since May 2022 (inflation from May 2022 to March 2023 was 15.6%), giving an updated cost of the Eatwell Guide for March 2023 of £8.65) and based on household composition. Data on household income from the Family Resources Survey for 2021/22 were used to calculate the proportion of disposable income (after housing costs were removed) that would be used up by the recommended diet. Data were analysed by income quintiles. The methodology used this year for this metric is the same as last year (*Broken Plate 2022*) but was updated in 2022 so the findings are not directly comparable to pre-2022 reports.



COST OF HEALTHY FOOD

The MRC Epidemiology Unit at the University of Cambridge built on food price research first conducted in 2014⁸² and matched price data for the 113 food and drink items that have been continuously tracked by the Office for National Statistics' Consumer Price Index (CPI) between 2013 and 2023 to food and nutrient data from the National Diet and Nutrition Survey from Years 1-9. Price per 1,000kcal in each quarter of each year was calculated for each item as well

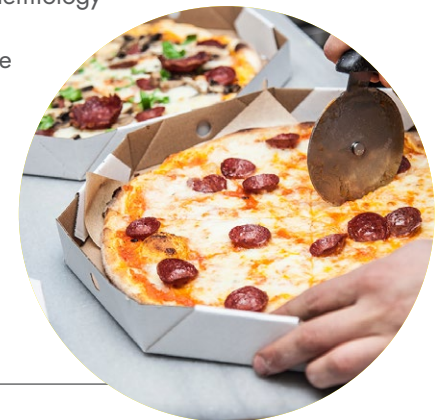
as the mean price across each quarter in each year calculated. Using price per kilocalories is a helpful way to understand the relative prices of foods which make up diets and meals, rather than comparing individual products within specific food categories. Each item was categorised as either 'more healthy' or 'less healthy' using the nutrient profiling model developed by the Food Standards Agency. Each food was also assigned to one of the five Eatwell Guide food groups. Mean price per 1,000kcal was then calculated per year for more and less healthy items, and for items in each of the five Eatwell Guide food groups. Due to the nature of the data included, it is not comparable between *Broken Plate* reports.

COST OF SUSTAINABLE ALTERNATIVES

The price and nutritional information of the food categories being studied and sold online from Aldi, Tesco and Waitrose were collected. Retailers were selected to cover a range of different price points. We looked at plain chicken breast (meat and plant-based alternatives) and coated chicken pieces, including; nuggets, dippers, 'popcorn', breaded or fried fillets/strips/pieces - (meat and plant-based alternatives) and chickpeas (ready-to-use/canned). The average price per 100g was then calculated. The average nutritional content was calculated using the ingredient and labelling information. Data were collected in March-April 2023. Data on environmental impact were based on a combination of relevant sources, including: a recent systematic review, Our World in Data, Mike Berners-Lee's UK carbon data charts, and the Open Food Facts website.

PLACES TO BUY FOOD ON THE HIGH STREET

Data on the proportion of fast-food outlets out of the total number of food outlets for each local authority were obtained by the MRC Epidemiology Unit at the University of Cambridge from Ordnance Survey's Points of Interest (POI) dataset for June 2022. The average proportion of fast-food outlets out of all food outlets within all local authorities in England was calculated. The data



have been compared to data from previous *Broken Plate* reports to assess changes over time. All local authorities were numbered according to their IMD ranking and divided into quintiles in equal proportions. The average density of fast-food outlets for each quintile of deprivation was then calculated.

AVAILABILITY OF LOW SUGAR OPTIONS IN KEY CHILDREN'S FOOD CATEGORIES

Between October 2022 and February 2023, Action on Salt and Action on Sugar collected data from nine major supermarkets (Aldi, Asda, the Co-operative, Lidl, Ocado (including Marks and Spencer), Morrisons, Sainsbury's, Tesco, and Waitrose) to assess the nutritional content of breakfast cereals and yogurts with packaging marketed to children. Information was mostly collected in store. Products that were available last year but not found in store were searched for online via retailer websites. Data from 133 breakfast cereals and 75 yogurts were captured. Products were then assessed against the Government's Front of Pack nutrition labelling guidance. The data have been compared to data from previous *Broken Plate* reports to assess changes over time.

BUSINESS TRANSPARENCY ON SALES OF HEALTHY AND SUSTAINABLE FOODS

27 major UK-operating retailers and out of home businesses (see the technical report for the list) were assessed by The Food Foundation in 2023 to see whether they were achieving 3 metrics: 1) reporting on the percentage of their sales that come from healthy foods; 2) reporting on the percentage of their sales that come from fruit and vegetables; and 3) reporting on the percentage of their protein sales that come from animal vs plant-based proteins. They were scored on the basis

of data collected from publicly accessible sources (e.g. company website and annual reports). As there are no centrally mandated definitions for these three food categories and a variety of methodologies are used across the industry, we did not require businesses to have adopted a particular definition (for example of 'healthy food'). Businesses were considered to be reporting against a metric if they 1) used a transparent and recognised approach to define which sales would count towards the relevant category; 2) released data on their sales in that category publicly; and 3) reported on sales across the whole category (and not just a sub-set of it). The headline statistic includes business that are reporting on any one of the three metrics, as opposed to last year's *Broken Plate* in which it only included businesses reporting on all three.

ADVERTISING SPEND ON FOOD

Data from Nielsen on advertising spend in the UK for food and soft drinks in 2022 were analysed, covering cinema, direct mail, door drops, outdoor, press, radio and TV. The percentage of advertising spend on different categories of food and drink, and on brand advertising was then calculated.

MARKETING OF BABY AND TODDLER SNACKS

Between October 2022 and February 2023, Action on Sugar collected data from nine major supermarkets (Aldi, Asda, the Co-operative, Lidl, Marks and Spencer,

Morrisons, Sainsbury's, Tesco, and Waitrose) to assess baby and toddler snacks. 102 snacks met the inclusion criteria. Sugar content was assessed using adult front of pack colouring criteria as there are no equivalent criteria for baby food (sugar data are based on total sugars, but most of the sugars in these products are free sugars). Packaging of products was then assessed for nutrition or health claims on the front of pack.

NUTRITIOUS FOOD CONSUMPTION

Data were analysed from the National Diet and Nutrition Survey Year 9-11 for adults over the age of 18, with the exception of salt. Quintiles represent equivalised income. The results were considered significant at $P < 0.05$. Salt data were from Year 5 (2014). Estimated salt intake was calculated using the equation $17.1 \text{mmol of sodium} = 1\text{g of salt}$ and assumes all sodium was derived from salt. For salt, income quintiles are HHINC not equivalised income quintiles.

ULTRA-PROCESSED FOODS CONSUMPTION

An academic study analysed data for children over the age of 11 years old and adults from the National Diet and Nutrition Survey 2018-2019. The study used the NOVA classification to define ultra-processed foods and evaluated the contribution of UPFs to total energy intake. This study was not commissioned or independently analysed by The Food Foundation.



CHILDREN'S DENTAL DECAY

The data presented are from the sixth National Dental Epidemiology Programme survey of 5-year-old children in England, 2022, conducted by the Office for Health Improvement and Disparities. The data was collected during the 2021/22 school year. Deprivation groups are based on the Index of Multiple Deprivation 2019 (IMD 2019) scores based on the home postcodes of the participants. Deprivation scores were used to allow weighting of the data to more closely match the actual distribution of deprivation quintiles in the source population. The figures presented are for dental decay and do not include enamel decay.



CHILDREN'S WEIGHT

The data presented were from the Governments' child measurement programmes in Reception in England and in Primary 1 in Scotland (aged 4-6 years). In both England and Scotland the Covid-19 pandemic caused some disruption to data collection in 2020/21 but detailed checks were carried out and weighting applied where required to ensure that the datasets were representative. Both Governments state that valid estimates of obesity prevalence were gathered, and that these can be

compared to data from other years. Data collection for the most recent year, 2021/22, was completed as normal. The most deprived quintile has been compared with the least deprived quintile. Northern Ireland uses a different definition of obesity and therefore, we are unable to compare it to the other nations. Due to pandemic restrictions, the child measurement programme for Wales was only able to collect data in two health boards.

CHILDREN'S GROWTH

Working with Office for Health Improvement and Disparities, data from the National Child Measurement Programme from the 2021/22 academic year were analysed to calculate the average height of children in Year 6 (aged 10–11 years) by deprivation group using the Income Deprivation Affecting Children Index (IDACI). The data were analysed by ethnic group, as there are some natural differences in average height by the time children reach puberty across ethnic groups. Only the data for White British ethnicities have been presented but further assessment of other ethnicities is required. Data from 2021/22 are not comparable to previous

years as disruption from the pandemic led to the data being collected later in the year and so the average height is taller.

DIABETES-RELATED AMPUTATIONS

Data from the Office for Health Improvement and Disparities' Diabetes Foot Care Profiles (which are based on data from Hospital Episode Statistics, the National Diabetes Audit, and the Quality and Outcomes Framework) were analysed. These data are reported for three-year periods, from which we took a yearly average. Amputations due to both type 1 and type 2 diabetes are included within these data. Data on amputations are not available broken down by deprivation group. Instead, we used data from the National Diabetes Audit on the proportion of individuals registered with type 2 diabetes (and other types of diabetes excluding type 1) in each quintile of deprivation as defined by the Index of Multiple Deprivation.

HEALTHY LIFE EXPECTANCY

Data from the Office of National Statistics on Healthy Life Expectancy at birth for 2018–20 were used and compared to data from 2017–19 included in last year's *Broken Plate* report. Healthy life expectancy at birth is an estimate of the average number of years babies born this year would live in a state of 'good' general health if mortality levels at each age and the level of good health at each age remain constant in the future. Data are reported for men and women per decile of deprivation based on the Index of Multiple Deprivation 2019. Data are also presented for international comparisons for 2019 from the World Health Organisation. The two sources are not directly comparable due to differing methodologies.

REFERENCES

1. Kantar, 2019. 38% of UK adults say they are trying to lose weight.
2. YouGov, 2022. Most people are worried about climate change – but what are they willing to do about it?
3. Crippa, M., Solazzo, E., Guizzardi, D. et al., 2021. Food systems are responsible for a third of global anthropogenic GHG emissions. *Nat Food* 2, 198–209. <https://doi.org/10.1038/s43016-021-00225-9>
4. National Food Strategy, 2021. The Plan.
5. UK Government, 2018. The Eatwell Guide.
6. Scheelbeek P, Green R, Papier K, et al., 2020. Health impacts and environmental footprints of diets that meet the Eatwell Guide recommendations: analyses of multiple UK studies. *BMJ Open* 2020;10:e037554. doi: 10.1136/bmjopen-2020-037554.
7. UK Government, 2023. Family Resources Survey 2021-2022.
8. The Food Foundation, 2023. Food Insecurity Tracking - Round 12.
9. Joseph Rowntree Foundation and The Trussell Trust, 2023. The Essentials Guarantee.
10. UK Government, 2023. Family Resources Survey 2021-22.
11. UK Government, 2023. Consumer Price Inflation, UK: April 2023.
12. The Food Foundation, 2023. Food Price Tracker.
13. The Food Foundation, 2023. Food Price Tracker.
14. London School of Economics, 2022. By the end of 2021, Brexit had already cost UK households a total of £5.8 billion in higher food bills.
15. The Food Foundation, 2023. Retailers must do more to prevent the cost of living crisis negatively impacting on our children's health.
16. Our World in Data. Per capita meat consumption by type, 2020.
17. National Food Strategy, 2021. The Plan.
18. Rippin HL, Cade JE, Berrang-Ford L, Benton TG et al., 2021. Variations in greenhouse gas emissions of individual diets: Associations between the greenhouse gas emissions and nutrient intake in the United Kingdom. *PLOS ONE* 16(11): e0259418. <https://doi.org/10.1371/journal.pone.0259418>
19. UK Government, 2019. UK becomes first major economy to pass net zero emissions law.
20. Stewart, C., Pernas, C., Cook, B. et al., 2021. The Lancet Planetary Health 5 (10), E699-E708 DOI: [https://doi.org/10.1016/S2542-5196\(21\)00228-X](https://doi.org/10.1016/S2542-5196(21)00228-X)
21. UK Government, 2022. Tracking the price of the lowest-cost grocery items, UK, experimental analysis: April 2021 to April 2022.
22. Euromonitor International. Accessed 2023 <https://www.euromonitor.com>
23. van Erpecum, CP.L., van Zon, S.K., Bültmann, U. et al., 2022. The association between the presence of fast-food outlets and BMI: the role of neighbourhood socio-economic status, healthy food outlets, and dietary factors. *BMC Public Health* 22, 1432 (2022). <https://doi.org/10.1186/s12889-022-13826-1>
24. Keeble, M., Adams, J., White, M. et al., 2019. Correlates of English local government use of the planning system to regulate hot food takeaway outlets: a cross-sectional analysis. *Int J Behav Nutr Phys Act* 16, 127 (2019). <https://doi.org/10.1186/s12966-019-0884-4>
25. Keeble, M., Burgoine, T., White, M., et al., 2019. How does local government use the planning system to regulate hot food takeaway outlets? A census of current practice in England using document review. *Health & Place*, Volume 57 (2019), p171-178. ISSN 1353-8292. <https://doi.org/10.1016/j.healthplace.2019.03.010>.
26. BBC News, 2022. South Shields takeaway units plan refused over obesity fears.
27. Brown, H., Xiang, H., Albani, V., et al., 2022. No new fast-food outlets allowed! Evaluating the effect of planning policy on the local food environment in the North East of England, *Social Science & Medicine*, Volume 306 (2022), 115126, ISSN 0277-9536, <https://doi.org/10.1016/j.socscimed.2022.115126>. <https://doi.org/10.1016/j.socscimed.2022.115126>.
28. UK Government, 2020. NDNS: results from years 9 to 11 (2016 to 2017 and 2018 to 2019).
29. UK Government, 2022. Sugar reduction – industry progress 2015 to 2020.
30. Feedback, 2023. Sugar rush: How UK supermarkets drive high sugar sales.
31. The Food Foundation, Plating Up Progress. Accessed 2023.
32. National Food Strategy, 2021. The Plan.
33. Public Health England, 2019. Foods and drinks aimed at infants and young children: evidence and opportunities for action.

34. World Health Organization, 2017. Sugars and dental caries.
35. Centre for Food Policy, 2020. OPRU Project 8: What policy options will be effective in encouraging healthy feeding practices among infants and young children?
36. Action on Sugar, 2021. The Sugar Content of Baby and Toddler Snacks.
37. World Health Organization, 2022. Foods for infants and young children: a matter of concern?
38. Nanchahal, K., Vasilejevic, M., Petticrew, M., et al., 2021. A content analysis of the aims, strategies, and effects of food and nonalcoholic drink advertising based on advertising industry case studies. *Obesity Science & Practice* 8 (2), p. 208-218. <https://doi.org/10.1002/osp4.561>
39. UK Government, 2022. Introducing further advertising restrictions on TV and online for products high in fat, sugar and salt (HFSS).
40. Yau A, Adams J, Boyland EJ, et al., 2021. Sociodemographic differences in self-reported exposure to high fat, salt and sugar food and drink advertising: a cross-sectional analysis of 2019 UK panel data. *BMJ Open* 2021;11:e048139. doi: 10.1136/bmjopen-2020-048139.
41. UK Government, 2021. Impact Assessment: Introducing a 2100-0530 watershed on TV and online.
42. Yau, A., Berger, N., Law, C., et al., 2022. Changes in household food and drink purchases following restrictions on the advertisement of high fat, salt, and sugar products across the Transport for London network: A controlled interrupted time series analysis. <https://doi.org/10.1371/journal.pmed.1003915>
44. Vandevijvere, S, Jaacks, LM, Monteiro, CA, et al., 2019. Global trends in ultraprocessed food and drink product sales and their association with adult body mass index trajectories. *Obesity Reviews*. 2019; 20(S2): 10–19. <https://doi.org/10.1111/obr.12860>
45. Madruga, M., Martínez Steele, E., Reynolds, C., et al., 2022. Trends in food consumption according to the degree of food processing among the UK population over 11 years. *British Journal of Nutrition*, 1-8. doi:10.1017/S0007114522003361
46. Parnham J, Chang K, Rauber F et al., 2022. The Ultra-Processed Food Content of School Meals and Packed Lunches in the United Kingdom. *Nutrients*. 2022; 14(14):2961. <https://doi.org/10.3390/nu14142961>
47. Conway, R., Heggie, L., Lowry, N. et al., 2023. Ultra-processed food intake of young children in the UK: Findings from the Gemini twin cohort. *Proceedings of the Nutrition Society*, 82(OCE1), E2. doi:10.1017/S0029665123000101.
48. Vandevijvere S, Jaacks LM, Monteiro CA, et al., 2019. Global trends in ultraprocessed food and drink product sales and their association with adult body mass index trajectories. *Obes Rev*. 2019 Nov;20 Suppl 2:10-19. doi: 10.1111/obr.12860. Epub 2019 May 17. PMID: 31099480.
49. Monteiro C and Cannon G, 2022. The trouble with ultra-processed foods *BMJ*; 378:o1972 doi:10.1136/bmj.o1972
50. Table Debates, 2022. What are Ultra-processed Foods?
51. World Health Organization, 2018. Oral Health.
52. UK Government, 2023. National Dental Epidemiology Programme (NDEP) for England: oral health survey of 5 year old children 2022.
53. Nature, 2023. Tooth decay remains top reason for child hospital admissions. *BDJ Team* 10, 6 (2023). <https://doi.org/10.1038/s41407-023-1798-1>
54. UK Government, 2023. Hospital tooth extractions in 0 to 19 year olds 2022.
55. British Dietetic Association, 2022. NHS dentistry: Have we reached the point of no return?
56. World Health Organization, 2018. Oral Health. Accessed April 2023.
57. Cascaes A, Silva N, Fernandez M, Bomfim R, Vaz J, 2022. Ultra-processed food consumption and dental caries in children and adolescents: a systematic review and meta-analysis. *Br J Nutr*. 2022 Jul 27;1-10. doi: 10.1017/S0007114522002409. Epub ahead of print. PMID: 35894293.
58. Association of Directors of Public Health, 2023. ADPH lead consensus on child oral health.
59. Orr J, Freer J, Morris J et al., 2021. Regional differences in short stature in England between 2006 and 2019: A cross-sectional analysis from the National Child Measurement Programme. *PLOS Med*. 2021 Sep 28;18(9):e1003760. doi: 10.1371/journal.pmed.1003760. PMID: 34582440; PMCID: PMC8478195.
60. NCD-RisC. Height: Evolution of adult height over time. Accessed 2023. <https://ncdrisc.org/data-downloads-height.html>

61. NHS Digital. National Child Measurement Programme. Accessed 2023.
62. Public Health Scotland. Primary 1 Body Mass Index (BMI) statistics Scotland. Accessed 2023.
63. UK Government. Health and life expectancies. Accessed 2023.
64. World Health Organization. Healthy life expectancy (HALE): Data by Country. Accessed 2023.
65. UK Government, 2022. Levelling Up the United Kingdom.
66. National Food Strategy, 2021. Evidence Pack.
67. Diabetes UK. Complications of Diabetes. Accessed 2023.
68. UK Government. Diabetes Footcare. Accessed 2023.
69. Dobbs, T., Gibson, J., Fowler, A., et al., 2021. Surgical activity in England and Wales during the COVID-19 pandemic: a nationwide observational cohort study. *British Journal of Anaesthesia*, 127 (2), 196-204, AUGUST 2021 <https://doi.org/10.1016/j.bja.2021.05.001>
70. Diabetes UK, 2023. Number of people living with diabetes in the UK tops 5 million for the first time.
71. NHS Digital, 2023. National Diabetes Audit (NDA) 2022-23 quarterly report for England, Integrated Care Board (ICB), Primary Care Network (PCN) and GP practice.
72. Diabetes UK, 2022. Diabetes and Obesity. <https://www.diabetes.co.uk/diabetes-and-obesity.html>
73. NHS Digital, 2022. Hospital Admitted Patient Care Activity 2020-21.
74. Future Health, 2022. Turning point: The case for new action in tackling obesity in England.
75. IPPR, 2022. Getting Better? Health and the Labour Market.
76. OECD. The Heavy Burden of Obesity: The Economics of Prevention. Accessed 2023.
77. OECD, 2019. The Heavy Burden of Obesity: The Economics of Prevention: United Kingdom. <https://www.oecd.org/unitedkingdom/Heavy-burden-of-obesity-Media-country-note-UK.pdf>
78. OECD. The Heavy Burden of Obesity: The Economics of Prevention. Accessed 2023.
79. The Behavioural Insights Team, 2022. Putting Health in the Spotlight: quantifying the impact of obesity on prevention policies in the UK.
80. Impact on Urban Health, 2022. Expanding free school meals: a cost benefit analysis.
81. Theis D. and White, M., 2021. Is Obesity Policy in England Fit for Purpose? Analysis of Government Strategies and Policies, 1992-2020. *Milbank Q.* 2021 Mar;99(1):126-170. doi: 10.1111/1468-0009.12498. Epub 2021 Jan 19. PMID: 33464689; PMCID: PMC7984668.
82. Jones, N., Conklin, A., Suhrcke, C et al., 2014. The Growing Price Gap between more and less healthy foods: Analysis of a novel longitudinal dataset. *Plos One*. <https://doi.org/10.1371/journal.pone.0109343>
83. NHS. Baby and toddler meal ideas. Accessed 2023. <https://www.nhs.uk/conditions/baby/weaning-and-feeding/baby-and-toddler-meal-ideas/>
84. First Steps Nutrition Trust, 2023. Ultra-Processed Foods marketed for infants and young children in the UK.





International House, 6 Canterbury Crescent, Brixton, London SW9 7QD
+44(0)20 3086 9953 | foodfoundation.org.uk

[🐦 @Food_Foundation](https://twitter.com/Food_Foundation) | [in thefoodfoundation](https://www.linkedin.com/company/the-food-foundation) | [📷 @food.foundation](https://www.instagram.com/food.foundation)