



FORCE-FED

Does the food system constrict healthy choices for typical British families?



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Acronyms

AHDB	Agriculture and Horticulture Development Board
CAP	Common Agricultural Policy
DECC	Department of Energy and Climate Change
DEFRA	Department for Environment, Food and Rural Affairs
EFRA	Environment, Food and Rural Affairs
FOP	Front of Pack (labelling)
FSA	Food Standards Agency
GHGE	Greenhouse Gas Emissions
HFSS	High Fat or Salt or Sugar Foods
LCFS	Living Costs and Food Survey
LFA	Less Favoured Area
NDNS	National Diet and Nutrition Survey
QSR	Quick-service Restaurant

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Executive Summary

This report looks at what typical British families eat, and what is influencing their choice of food and drink. We examine how easy it is for them to choose a healthy diet and review whether government policy could do more to make healthy choices easier.

Our typical British families have four members; two adults, and a primary and secondary school-age child. They have a total household income between £37,000 and £52,000; the middle-income band in the UK in 2013. There are approximately 1.5 million families of four in the UK who have an income at or below this level. Parents in our typical families are administrators, teachers, health professionals and builders. In the report we compile a picture of their diet, where they get their food and what influences their choices using national data sets, primary data collection, secondary sources and key informant interviews.

There are three main findings:

The diets of typical British families now pose the greatest threat to their health and survival. None of our family members meet all seven dietary standards that directly protect their health.

Two thirds of their calories come from highly processed foods many of which are, low in fibre and high in fat, sugar and or salt (HFSS). Adults are eating too much red and processed meat. The diets of children are particularly concerning: 47% of primary school children's dietary energy comes from HFSS foods, 85% of secondary school children are not eating enough fruit and vegetables, more than 90% are not eating enough fibre and all are eating too much sugar. Families are spending nearly a fifth (18%) of their money on food, throwing a lot away (equivalent to 6 meals per week), and not getting value for money.

A multitude of factors in their food environment get in the way of our family eating healthily.

- Advertising of food and drink reaches our family members, including the children, through multiple channels. Advertising budgets for unhealthy food and drink far exceed healthy products. Adverts for prepared convenience foods and confectionery account for 60% of food advertising spend.

- There is an abundance of food conveniently available to our family members. The number of places to eat out has increased by more than 50% in the last 10 years and the single biggest category is quick service restaurants (QSRs) which typically sell less-healthy meals.

- Promotions cause us to buy one fifth more than we otherwise would. Supermarket and eating out promotions are biased towards unhealthy foods. Cutting promotions on high-sugar foods and drinks could reduce our sugar consumption by 6%.

- Healthy choices within our family's popular product categories are limited. Only 5% of items, in four product lines bought by typical families (ready meals, breakfast cereals, bread and yoghurts), have low levels of fat, saturated fat, sugar and salt. Some products have quantities of nutrients which, in a single portion, exceed daily allowances.

- Labelling is confusing due to inconsistent use of traffic lights, no consistency in the use of portion sizes, continued use of *display until* and *sell by* dates and inconsistency between nutrient claims and traffic lights.

- School meals offer children protection from all this during the school day, and during term time, but uptake is only high among infants for whom the meals are free. Packed lunches are typically less healthy and the benefits of school food are undermined by what happens beyond the school gates.

We look at these factors in detail and show how government policy is currently too weak or inadequate to deal with these challenges to healthy eating.

The balance of prices of their food is wrong, tipping them even further towards unhealthy diets. Healthier foods are three times more expensive than HFSS foods as a source of dietary energy and the price difference is growing. Quick service restaurant meals which tend to be less healthy are on average £10 cheaper than meals in pubs, restaurants and hotels. The cheapest foods tend to be high in fat, sugar or salt and low in fibre and are often highly processed. In contrast, fresh fruit and vegetables are

relatively expensive. Meat is affordable to typical families but carries a large environmental footprint. We look at the range of factors that are contributing to this price picture by tracing back, through the food system, three items that are popular to typical families: fresh meat, a yoghurt and potatoes, and show how government policies contribute to this situation.

- **Cheap meat:** It costs about £1.50, and takes 35 days to produce a chicken that is ready to eat. Intensive chicken farming is very efficient and profitable, but farmers benefit from subsidies. Beef production is heavily subsidised and in spite of the higher production costs, the cost to consumers is similar to chicken. Moreover, some of the costs of meat production are externalised and not captured in the production or retail costs – such as the environmental impact of feeding chickens on imported soy.

- **Cheap processed food:** The brand-leading yoghurt purchased by typical families is a cheaper source of calories than natural yoghurt. By partly substituting yoghurt and adding 12 other ingredients, a processed yoghurt can be produced more cheaply and with a higher profit margin, but with levels of sugar which almost exceed a child's daily allowance.

- **Costly vegetables:** With the exception of potatoes nearly half (42%) of all other vegetables eaten in the UK are grown outside the country. UK vegetable production is declining. Vegetables imported from outside Europe are subject to import tariffs. While general cropping farms growing potatoes receive significant subsidies, horticulture farms are the least subsidised of all. The Groceries Code Adjudicator has limited powers, which means that retailers and their intermediary suppliers, secure a larger proportion of the value of potatoes sold. Retailers' grading standards mean up to a third of vegetables are wasted before reaching the store.

Educating individuals on how to make healthy choices can't work when there are so many factors pushing behaviour in the opposite direction. The onus is on government to take concerted action (from local to European level) to make it easier for people to eat healthily. We recommend four actions for government:

Executive Summary (continued)...

1) Set out a clear vision for achieving healthy and sustainable diets for all, with targets that can be monitored.

This should be in support of the world's new 2030 Sustainable Development Goals and build on the Paris climate summit and forthcoming Childhood Obesity Strategy. The 2016 Rio Olympics' Nutrition for Growth summit would provide a global platform to make this commitment.

2) Use policy measures to achieve a healthy balance in food costs.

Policies that affect the relative price of healthy and unhealthy food should be reviewed. Efforts to reduce household waste and increase purchasing power of family budgets should be strengthened. Introducing a 20% excise duty on sugar-sweetened beverages should be implemented. Beyond this, adjusting policy to make vegetables more affordable should be a priority, including using subsidies, renewable energy incentives and waste reduction policy more strategically. This should be the focus of an Environment, Food and Rural Affairs Select Committee Inquiry and a central component of the review of the Groceries Code Adjudicator in 2016.

3) Manage the food environment so it enables healthy choices, particularly for children.

Priorities are:

- a. Banning advertising of HFSS foods on TV before the 9pm watershed.
- b. Developing a new marketing code to prevent advertising, sponsorship and promotions of HFSS through all non-broadcast channels, in supermarkets and eating out establishments.

- c. Helping to increase the proportion of low cost, healthy eating out options by clarifying planning policy for unhealthy eating-out establishments near schools and enforcing the Government Buying standards to help drive up standards for all food service suppliers.
- d. Setting upper limits for high risk nutrients in processed foods.
- e. Driving for improvements in labelling regulations in Brussels.
- f. Incentivising school leadership on school food using Ofsted inspection.

Local authorities and cities that are leading the way in improving food environments should be given opportunities to influence central policy making, using channels such as the Local Government Association/Department of Health's Care and Health Improvement Programme.

4) Make it easier for consumers to know what they are eating so they are empowered to demand a healthy and sustainable food system. Supply chains for processed foods have become complex and opaque making it hard for consumers to know what they are eating. For fresh food, much more could be done with livestock farmers, processors and retailers to better inform consumers about the meat they eat, how it is produced and its environmental footprint. This requires a clear role for the Food Standards Agency in setting standards around transparency and publicly available information about products on sale, development of digital tools to allow consumers to easily access this information and working with the media to communicate the information.

Good nutrition underpins strong economies. It is crucial to cognitive development, educational and skills attainment. It prevents absenteeism at work and improves productivity. It reduces health care costs. Tackling obesity could deliver economic benefits worth £17billion per year including an £800m annual saving to the NHS. Sound economic planning requires balancing short-term productivity gains against long-term economic advantage achieved by having a healthy workforce, and addressing inefficiencies created by irrationalities in the policy environment.

The children in our typical family have very poor diets; one in three of them are overweight and obese, with all the concomitant psychological and health consequences; and a growing number are even experiencing Type 2 diabetes in adolescence. These children are tomorrow's parents and our future workforce. If nothing else, we need a food system and food policy that goes much further in helping to ensure that they can eat more healthily.

This report offers a system-based analysis of some of the policy levers that can be used to make it easier for typical British families to make healthy choices and avoid the life-threatening and costly consequences of diet-related disease, while at the same time going further to protect us all from the disastrous effects of climate change.





Introduction



There is now overwhelming evidence that what we eat poses the greatest threat to our health and survival (Newton, et al., 2015). Moreover, it carries an economic as well as a human cost. McKinsey has recently estimated that implementing a package of interventions to tackle obesity in the UK would deliver economic benefits worth £17billion per year including an £800m annual saving to the NHS (McKinsey Global Institute, 2014). Public Health England estimates that reducing sugar consumption alone within 10 years could deliver annual NHS savings of £500m per year (Public Health England, 2015).



There is also growing recognition among policymakers that educating individuals about how to make healthy choices in the supermarket or takeaway restaurant will not move the needle enough to curb diet-related disease and bring down the burgeoning healthcare bill associated with obesity. While nutrition education and measures to encourage behaviour change are important, we need to look to the food environment and food system to find ways to tackle unhealthy diets (see Box 1). Evidence shows that this is likely to deliver a much greater impact than focusing on individual behaviour (Swinburn, et al., 2011).

In this report, we ask how easy it is for typical families in Britain to choose a healthy diet.

Specifically, we ask two questions:

1. In what ways does the food system make it harder for these families to choose a healthy diet?
2. Is public policy doing enough to incentivise and regulate the food system to optimise their chances of choosing a healthy diet?

What is a 'typical' family?

We've looked at national statistics that describe the situation for adults and children living in households with a gross income of £37,000 to £52,000¹, which is the average (third quintile) household income in the UK in 2013. Typically, parents in these families do a range of jobs, including being administrators, teachers, health professionals, builders, and plant and machine operatives. We report on a family of four with two adults and two children – one in primary school and one in secondary school. In 2014, there were 5.9 million families in the UK comprised of opposite-sex couples living with dependent children. Of these families, 2.5 million had two children and of these, 60% of them had a household income at or below the level of our 'typical' family (ONS, 2014). We mostly draw on data from England to describe this family (as many of the national datasets are now devolved), although we consider public policy measures in place across the UK.

Our research methods and their limitations are described in detail at www.foodfoundation.org.uk (Food Foundation, 2015). Box 2 describes the key data sources. It is worth noting, of course, that in reality there is no such 'typical' family. Everyone's unique circumstances affect how they experience the food system and what they consume, so we are basing our narrative on an average experience. We draw largely on data from 2013 – the most recent data in many instances. Where relevant, we point out where the situation is likely to be very different for those on a low income, but inevitably we overlook the specific circumstances of these families or other specific groups such as babies and toddlers, the elderly, pregnant women, ethnic-minority families or lone parents.

Report overview

In Chapter 1, we describe the quality of our typical family's diet using national datasets. We then go on to summarise some of the key consequences of this diet on their health and wellbeing, and the environment and the extent to which the government is committed to tackling these consequences.

In Chapter 2, we describe where they get and eat their food and what food they are buying and eating.

In Chapter 3, we examine the food environment to identify drivers of food choice, the most important of which is price, to see if these are helping or hindering these families. We also review the public policy measures that are in place to influence the way in which these drivers impact on them.

In Chapter 4, we go behind the scenes in the food system and use some of the items in their shopping basket to shed light on how policies and practice in the wider food system contribute to price specifically.

Each chapter ends with conclusions and detailed recommendations. In the last chapter, we draw conclusions and make overarching recommendations.



BOX 1: DEFINITIONS

We define the food system as the production, marketing, transformation, sale and purchase of food, and the consumer practices, resources and institutions involved in these processes.

We define the food environment as a dynamic space in which a range of food options open up to consumers based on food availability, accessibility, affordability and appeal. The food environment is part of the wider food system.

We define public policy as the policy frameworks and regulations operating at European, UK government, devolved government and local authority level that directly affect the food system.

(Global Panel on Agriculture and Food Systems for Nutrition, 2014)

BOX 2: DATA SOURCES

In Chapter 1, the National Diet and Nutrition Survey Rolling Programme (2008–2012) (NatCen Social Research, et al., 2015a) and the Health Survey for England 2013 (NatCen Social Research, et al., 2015b) were used to examine dietary intakes and health outcomes for adults, and primary and secondary school age children in typical households living in England. The Children’s Dental Health Survey 2013 (Health & Social Care Information Centre, 2013) was used to identify dental caries in children aged five, eight, 12 and 15 years living in England.

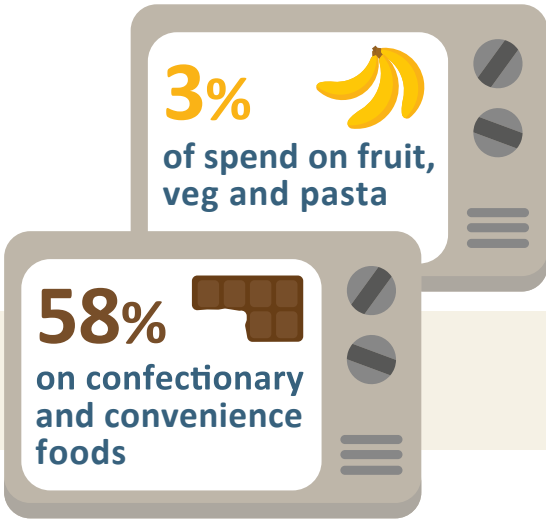
Chapter 2 uses data from the Living Costs and Food Survey 2013 (ONS, et al., 2015) to look at spending on food and drink purchased for household consumption and eating out for typical households in England with one or more children. Shopping basket data on retail food and drink purchasing in 2013 was obtained from Kantar Worldpanel and was based on all households in the UK. Although the Kantar Worldpanel data was not specific to our typical family, and the overall household size is smaller (average 2.3 members), there were few differences in the data when compared with lower-income households with children.

Data on school meal uptake in primary and secondary schools in England was obtained from the School Lunch Take-up Survey 2013/2014 (Department for Education, 2015). Horizons provided information on eating out patterns and the UK foodservice (Horizons, 2015). Food waste estimates were derived from data in a 2012 UK household food and drink waste report by WRAP (WRAP, 2013).

Chapter 3 is based on a literature review on drivers of food choice in the UK, where possible drawing on findings from systematic reviews. We use the Kantar Worldpanel shopping basket and Horizons data used in Chapter 3 to identify product categories to investigate further in terms of formulations and labelling of commonly purchased processed foods in leading UK retailers. For this analysis (referred to as the Labelling snapshot) we used supermarket online stores.

In Chapter 4, we use key informant interviews, government data and grey literature to trace back three product categories in the Kantar Worldpanel shopping basket to understand the drivers behind their price.

Advertising



! Advertising of unhealthy food is only banned on TV for children's viewing times



Convenience

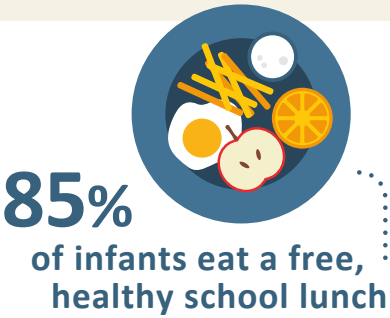
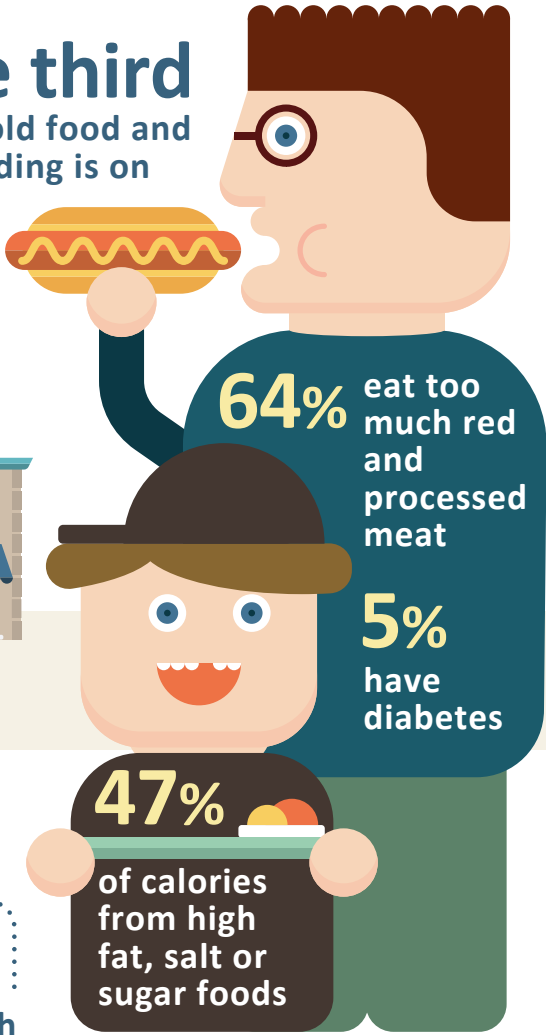


Price



! VAT not applied consistently to unhealthy foods

One third of household food and drink spending is on eating out



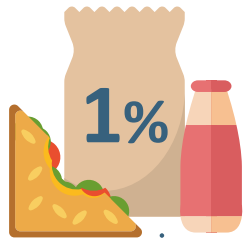
! Strong school food policy but Ofsted inspectors aren't required to eat a school meal

Making healthy choices easier

1 Set out a clear vision for achieving healthy and sustainable diets for all with measurable targets

2 Control food marketing, formulations and planning so it is more conducive to healthy eating

Formulation/ingredients



1%
of packed lunches are healthy



5% of breakfast cereals have all green traffic lights

! No limits on high risk ingredients



74% are not eating enough fruit and veg

25% are obese

70%
of food is bought from the 4 major supermarkets



Promotions

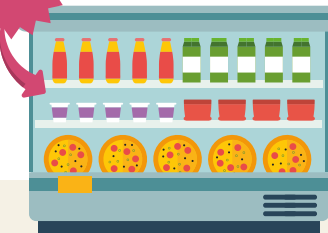
cause us to buy

20%

more than we would

! No restrictions on promotions

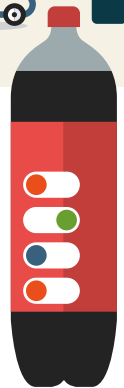
Save



Labelling

Over half
of people say current nutritional information is difficult to understand

! Voluntary front of pack labelling rules



3 Prioritise measures to re-balance food prices and incentivise healthy diets starting with a tax on sugary drinks and EFRA inquiry into vegetables

4 Mobilise consumer power to shape the food system by helping people to understand what is in their food and how it is produced

Typical families, their diets and the consequences



Chapter 1



In this chapter, we consider the diets of typical families and compare them to dietary recommendations. We also briefly consider dietary trends and report whether the situation is getting worse or better for specific nutrients and food groups. We then explain the consequences of this diet on our families' health and the environment. Finally, we review government commitment to tackling diet-related disease, as well as reducing greenhouse gas emissions, acknowledging that the former is soon to be refreshed in England with the forthcoming publication of the Childhood Obesity Strategy.

HOW GOOD IS THEIR DIET?

We compare our typical family members' reported consumption with the government's dietary recommendations – for specific nutrients, these are called Dietary Reference Values (DRVs), which are estimates of requirements of specific nutrients for groups of people (not individuals). Accurate dietary intake data is difficult to get because people often misreport what they eat, but here we use the best data available from the National Diet and Nutrition Survey (NDNS) gathered during a rolling programme between 2008 and 2012 (NatCen Social Research, et al., 2015a).

Too much: sugar, salt, saturated fat, and red and processed meat

Table 1 shows that more than two-thirds of adults, and secondary and primary school children in typical families exceed recommended intakes of sugar, salt and saturated fat. All children in our family eat more sugar than recommended and only one in 10 adults meet the recommended levels.

Two-thirds of all family members have too much salt, although the situation is a little better for primary school children aged seven to 10 years. Our family members also eat substantially more protein than they need: between a third and a half of the protein eaten by our family members comes from meat. Our family members typically eat 1.5 to two times more red meat than white meat. Almost two-thirds of men and more than a quarter of women eat too much red and processed meat, which is linked directly to colorectal cancer.

		RECOMMENDED LEVELS	AVERAGE (MEAN)	% EXCEEDING RECOMMENDED LEVELS	TRENDS AND DIETARY SOURCES
FREE SUGARS ²	Adults	≤5% of energy for all ages	12%	87	Our sugar consumption has declined since the 1950s when rationing was lifted, but has plateaued in the last 5 years. Our sources of sugar have changed considerably over time with non-alcoholic beverages becoming a very important source compared with table sugar (used in home baking etc.), which was an important source in the 1960s and 1970s.
	Secondary school children		16%	99	
	Primary school children		14%	100	
SALT	Adults	6g/day	8g/day	68	Salt consumption dropped in the mid 2000s as a result of the Food Standard Agency's salt reduction work with the food industry. Cereals and cereal products, including bread, are the largest contributor to salt intake. Salt intakes have since plateaued (Department of Health, 2012a).
	Secondary school children	6g/day	7g/day	66	
	Primary school children	5g/day (7–10 years)	4g/day	41	
		3g/day (4–6 years)	4g/day	67	
SATURATED FAT	Adults	≤11% of food energy for individuals aged 5 years and above	12%	66	Our saturated fat consumption has declined from about 20% in 1975 (Foster & Lunn, 2007). Milk and milk products are the largest contributor to saturated fat consumption in children, while meat products are more important for adults.
	Secondary school children		13%	71	
	Primary school children		13%	85	
RED AND PROCESSED MEAT ³	Adults	≤70g/day	74g/day	64 (men); 33 (women)	Overall, our meat consumption has remained fairly stable over time, but there have been big shifts in the type of meat we eat. We now eat less beef, pork and lamb, but our chicken consumption has increased five times since the 1960s (Foster & Lunn, 2007).
	Secondary school children		70g/day	43 (adult cut-off)	
	Primary school children		46g/day	23 (adult cut-off)	
TOTAL FAT	Adults	≤35% of food energy for individuals aged 5 years and above	34%	48	
	Secondary school children		34%	43	
	Primary school children		33%	41	

Table 1: Nutrient intakes for typical family members compared to Dietary Reference Values (1)

Too little: fibre, fruit and vegetables, oily fish

In contrast, our family members eat too little fibre, fruit and vegetables (which should be an important source of fibre in our diets), and oily fish. More than three-quarters of adults and secondary school children don't get their five-a-day, while a staggering 90% of adults and secondary school children in our families aren't eating enough fibre – see *Table 2*.

Other nutrients

On average, family members had adequate intakes of most vitamins. However, 22% of adult women and 48% of secondary school girls aged 11 to 18 years had iron intakes below recommended levels. Other minerals, such as magnesium, potassium and selenium were below recommended levels in older children and adults, but the health implications of this are unclear.

We know that, overall, family members are consuming too many calories because they have high levels of obesity (see below), but the national data show that men reported consuming 2,030kcal per day and women reported consuming 1,550kcal per day – below-average energy requirements. However, a sub-study using an objective biomarker of energy intake – the doubly labelled water method⁵ – found a 25% under-reporting of mean energy intakes. These missing calories are more likely to come from soft drinks, confectionery, alcohol (for adults) and high-fat foods and food eaten on the go. According to the data on household food purchases (from the Living Costs and Food Survey), typical households consumed an average of 1,933kcal per person per day.

Preschool children: data gaps

We did not include a pre-school child in our typical family, but food (particularly breast milk) in the first years of life has important consequences for the short-term and life-long health of children. Moreover, it is during these years that dietary preferences are established. The Infant Feeding Survey (IFS) is a national survey that has been conducted every five years since 1975, with the last survey published in 2010. The survey

Table 2: Nutrient intakes for typical family members compared to Dietary Reference Values (2)

		RECOMMENDED LEVELS	AVERAGE (MEAN)	% NOT ACHIEVING RECOMMENDED LEVELS	TRENDS AND DIETARY SOURCES
FIBRE ⁴	Adults	≥30g/day	18g/day	97	We're eating less vegetables, potatoes and bread than we were in the 1960s, but these still remain the biggest sources of fibre in our diet. Fruit consumption has increased.
	Secondary school children	≥25g/day (11–16 years) ≥30g/day (16–18 years)	17g/day	92 (boys 88; girls 98)	
	Primary school children	≥20g/day	16g/day	78	
FRUIT AND VEG	Adults	≥5 portions/day for individuals aged 11 years and above	4 portions/day	74	
	Secondary school children		3 portions/day	85	
	Primary school children		NA	NA	
OILY FISH*	Adults	140g/week for all ages	56g/week	83	
	Secondary school children		24g/week	91	
	Primary school children		17g/week	92	

* Oily fish consumption data is difficult to interpret because levels are so low.

provides estimates on the incidence, prevalence and duration of breastfeeding and other feeding practices adopted by mothers in the first year of a child's life. In 2014, it was reported that the IFS 2015 would no longer continue. Although the NDNS collects detailed dietary-intake data on children, this data is only collected from children aged one-and-a-half years and above, leaving a data gap for children under this age. Small sample sizes for children between one-and-a-half and three years of age in the NDNS also means that interpretation of sub-group analyses for these age groups is often problematic. A one-off survey of 4-18 month old children was conducted in 2011 which partially addresses this gap, but data gaps going forward seem likely.

People on low incomes

Dietary intakes of some food groups and nutrients vary by household income level. Figure 1 presents food purchase data by socioeconomic group, showing that the differences are extremely stark for fruit and vegetable consumption. In general, where differences are seen, they are usually towards poorer diets in lower-income quintiles. NDNS data suggests that individuals in lower quintile groups consume significantly less fibre. However, fibre intakes were below recommendations at all household income levels. For adults, the percentage of energy from sugar was higher in lowest-income households, although intakes exceeded recommended levels across all income groups.

“More than three-quarters of adults and secondary school children don't get their five-a-day, while a staggering 90% of aren't eating enough fibre.”



Dietary overview

There are three other measures that help capture the quality of our typical families' diets.

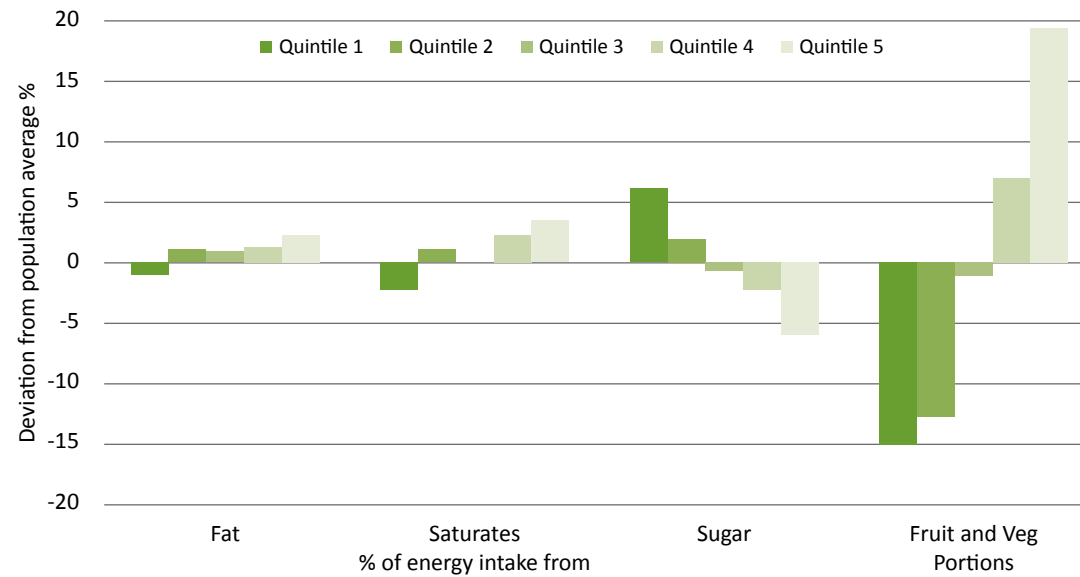
First, we looked at the proportion of family members who met all the recommended levels in the two tables previously. None did.

Second, we looked at the proportion of dietary energy coming from foods deemed "less-healthy", based on nutrient content. These are foods banned from TV advertising for children because of their high fat, sugar or salt content (HFSS). These include foods such as confectionery, sweetened milkshakes and crisps⁶. Foods are classified as HFSS using a nutrient profile model⁷ developed by the Food Standards Agency and used to inform advertising regulations (see Chapter 3). Table 3 shows that almost half of the kilocalories consumed by primary school children come from HFSS foods.

Third, we looked at the proportion of dietary energy that comes from ultra-processed foods (see Box 3). For this analysis, we use the NOVA classification for processed and ultra-processed foods (Monteiro, et al., 2015) and used it to classify food entries in the NDNS dataset based on the degree of processing. Ultra-processed foods are defined as those 'formulated mostly or entirely from substances derived from foods. Typically, they contain little or no whole foods. They are 'durable, convenient, accessible, highly or ultra-palatable, often habit-forming. Typically not recognisable as versions of foods, although they may imitate the appearance, shape and sensory qualities of foods. Many ingredients are not available in retail outlets.' (Moubarac, et al., 2013).

Figure 1: UK dietary indicators by equivalised income

Source: (DEFRA, 2015a)



BOX 3: ULTRA-PROCESSED FOODS

Ultra-processed foods include: Chips (crisps), many types of sweet, fatty or salty snack products; ice-cream, chocolates and candies (confectionery); French fries (chips), burgers and hot dogs; poultry and fish 'nuggets' or 'sticks' ('fingers'); breads, buns and cookies (biscuits); breakfast cereals; pastries, cakes and cake mixes; 'energy' bars; preserves (jams), margarines; desserts; canned, bottled, dehydrated and packaged soups and noodles; sauces; meat; yeast extracts; soft, carbonated, cola and 'energy' drinks; sugared, sweetened milk drinks, condensed milk and sweetened including 'fruit' yoghurts; fruit and fruit 'nectar' drinks; instant coffee and cocoa drinks; no-alcohol wine and beer; pre-prepared meat, fish, vegetable, cheese, pizza and pasta dishes; infant formulas, follow-on milks, other baby products; 'health and 'slimming' products such as powdered or 'fortified' meal and dish substitutes.

		% DIETARY ENERGY
Foods banned from being advertised on TV to children for being high in fat, sugar or salt (HFSS) or 'less healthy'	Adults	37
	Secondary school children	45
	Primary school children	47
Ultra-processed foods	Adults	58
	Secondary school children	65
	Primary school children	64

Table 3: Proportion of dietary energy coming from HFSS and ultra-processed foods for typical family members



HOW DOES THEIR DIET IMPACT THEIR HEALTH AND ENVIRONMENT?

Health impacts

The latest evidence from the global burden of disease project shows that diet⁸ is the biggest risk factor to death and disability in England and, combined with high BMI, can be attributed to more than 20% of all Disability Adjusted Life Years (a combined measure of death and disability) (Newton, et al., 2015).

There are many forms of diet-related disease. Table 4 looks at the prevalence of three types among our typical families (NatCen Social Research, et al., 2015b). The data on excess weight (overweight and obesity) uses the Health Survey for England to show the picture for our typical families. Obesity affects one in 10 primary school children and one in five secondary school children in our families. Nearly half of all children have dental caries in their primary teeth and/or their permanent teeth (Health & Social Care Information Centre, 2013). One in 20 adults in our families has diabetes, 90% of which is Type 2 diabetes. The diabetes figure includes self-reported, doctor-diagnosed diabetes, but the real figure is thought to be higher due to undiagnosed cases. Type 2 diabetes in adolescents began to appear at the start of this century and there are now an estimated 600 cases (DiabetesUK, 2015).

	PREVALENCE (%)			
	OVERWEIGHT AND OBESITY	OBESITY	DIABETES	DENTAL CARIES ⁹
Adult men	67	22	5	
Adult women	56	25	6	
Secondary school children ¹⁰	27 (boys); 38 (girls)	20 (boys); 18 (girls)		32 (12 years) 44 (15 years)
Primary school children ¹¹	21 (boys); 24 (girls)	10 (boys); 9 (girls)		31 (5 years) 45 (8 years)

Table 4: Prevalence of diet related disease among typical family members

Environmental impacts

Typical family diets are not only causing widespread health risk but are also contributing to climate change. The production of food gives rise to greenhouse gas emissions (GHGE) through the processes of agricultural production, processing, transport, storage, cooking and disposal of waste. In 2013, farming, fishing, fertiliser, manufacturing and catering were estimated to be responsible for 70 million tonnes of CO₂ equivalent GHGEs (mt CO₂e), equivalent to 12% of the total UK emissions (DEFRA, 2015a). This does not take into account emissions from non-fertiliser pre-farm production, land-use change, food packaging, retailing, households, food waste and net trade.

Research has shown that the average UK diet (not specific to our families) consumed over a year produces as much in terms of CO₂ emissions as a car driven for almost 5,000 miles (Green, et al., 2015) (see Appendix Table 1). Large quantities of water are also required to produce our food, some originating within the UK and some linked to imported food. The average European diet has been estimated to use enough water to fill 53 baths per person per day (Vanham, et al., 2013). Figures 2 and 3 show that the largest contributors to GHGE and water footprint in our diets are red meat, dairy products and soft drinks. The GHGE figures are based on life cycle analysis, which captures use across the supply chain, but does not include land-use emissions, which is particularly important for animal feed that includes soy (see Chapter 4).



Improving diets delivers health improvements and a reduction in GHGE and water footprints

Recent research indicates that bringing UK diets into line with international dietary recommendations while maintaining a dietary pattern familiar to the UK would reduce UK diet-related GHG emissions by 17% (Green, et al., 2015). The research also showed that, if adopted, these dietary changes would have important benefits for the health of the UK population, saving almost seven million years of life lost prematurely in the UK over the next 30 years, and extending average life expectancy by approximately eight months, mainly from reductions in coronary heart disease and stroke. The dietary changes that could lead to reductions in emissions include reducing intake of animal products, modifying the types of meat and dairy products consumed (i.e. chicken and milk), cutting down on the consumption of savoury snacks, eating fruits and vegetables that are associated with lower emissions, and increasing intake of cereals. A similar analysis has been done for the water footprint, comparing the average EU diet with a recommended healthy diet (Vanham, et al., 2013). Adopting the dietary recommendations resulted in a 23% reduction in the water footprint of the diet. The highest water footprint savings are attributed to a reduction of meat intake, followed by a reduction in oil and sugar intake.

Figure 2: Sources of GHGE in the average diet (excluding land-use emissions; top 10 identified; Green et al, 2015)

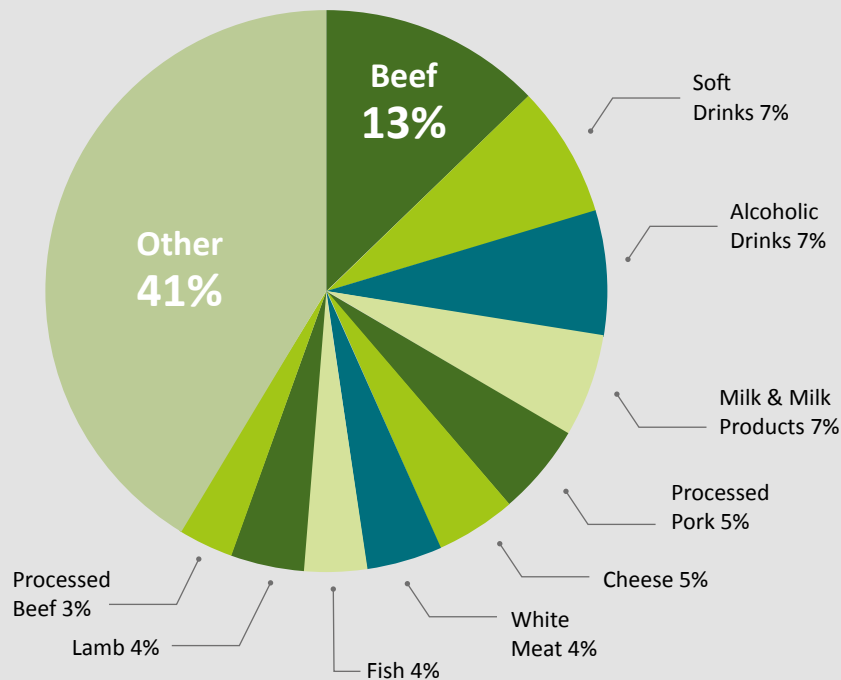
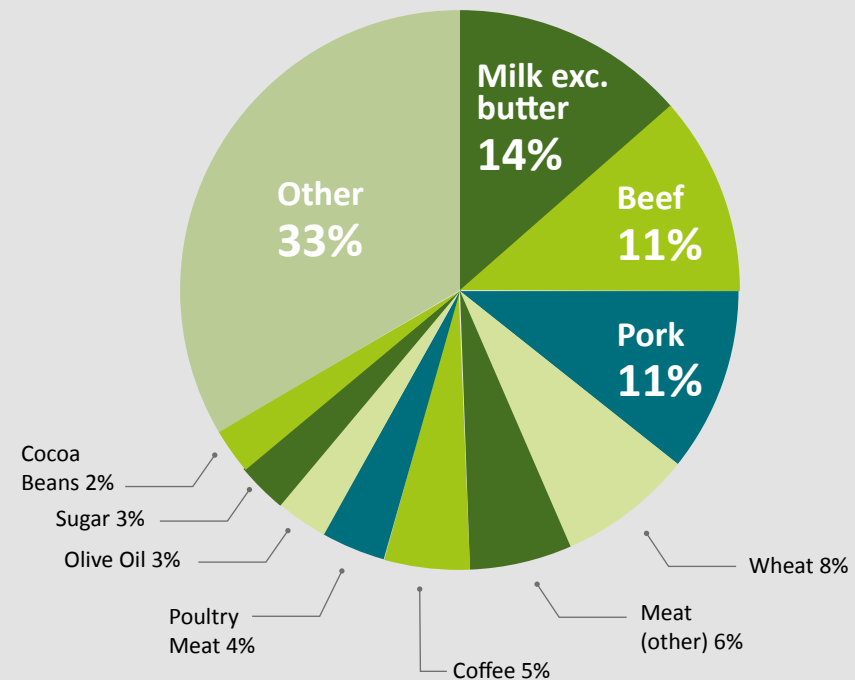


Figure 3: Sources of water use in the average European diet (top 10 identified; Vanham et al, 2013)





“Bringing UK diets into line with international dietary recommendations would reduce UK diet-related greenhouse gas emissions by 17%.”

Government commitments

We have shown in this chapter that diets in our typical families fall far short of dietary recommendations and that this is making them overweight and obese, as well as causing a range of other diet-related disease, with all the concomitant health and social consequences. We have also shown that there are significant gains to be made by making eating patterns healthy, not just in terms of reducing diet-related disease, but also in reducing greenhouse gas emissions.

The government has committed to tackle obesity, although the targets set are quite unspecific and there is little evidence that they are on track (see Box 4). Government policy captured in *Obesity and Healthy Eating 2010 to 2015* (Department of Health, 2015) takes a three-pronged approach to improving diets.

- First, it aims to help people make healthier choices by giving them advice on a healthy diet and physical activity through the Change4Life programme (NHS, 2015a), improving labelling and encouraging businesses on the high street to include calorie information on their menus, and giving people guidance on how much physical activity they should be doing. All devolved governments have similar models to the Change4Life programme (NHS, 2015b).
- Second, it encourages businesses through the Public Health Responsibility Deal (Department of Health, 2011b) to commit to taking voluntary action. Scotland (The Scottish Government, 2014) and Wales also have versions of the Responsibility Deal. Evaluations of the Responsibility Deal have shown its impact has been limited (Knai, et al., 2015).
- Third, the Health and Social Care Act 2012 gave local authorities new responsibilities and resources to *‘take such steps as it considered appropriate for improving the health of the people in its area.’* Local authorities set up statutory health and wellbeing boards to drive local commissioning and integration of all health services, based upon local needs. A public health outcomes framework (2013–2016) (Department of Health, 2012b) was adopted to guide local authority spending, which includes the objective: ‘People are helped to live healthy lifestyles, make healthy choices and reduce health inequalities.’

Importantly government measures to date tend to focus on shifting behaviour (of individuals or companies), and not tackling the food environment and food system that incentivise or encourage this behaviour.



BOX 4: UK COMMITMENTS TO TACKLE OVERWEIGHT AND OBESITY

In 2011, the government in England committed to:

- 1) a sustained downward trend in the level of excess weight in children in England by 2020. Figure 4 shows there has been a very slight decline in excess weight among reception-age children, but no decline in Year 6 children*
- 2) a downward trend in the level of excess weight averaged across all adults in England by 2020. Figure 5 shows that rates have not yet declined over this period.*

Scotland has a similar target to England on obesity in adults (The Scottish Government, 2010). Wales has 'reducing unhealthy eating' as one of 10 priority areas in its 10-year Our Healthy Future plan published in 2009. For this, it monitors obesity rates and consumption of fruit and vegetables. Northern Ireland has set the most ambitious targets: it takes a cross-sectoral, integrated, life-course, and long-term (10 year) approach, aiming to reduce the level of adult obesity by 4% and to reduce the level of obesity in children by 3% by 2022 (Public Health Agency, 2012).

Figure 4: Prevalence of excess weight among children in England (National Child Measurement Programme) 2010-2015, %

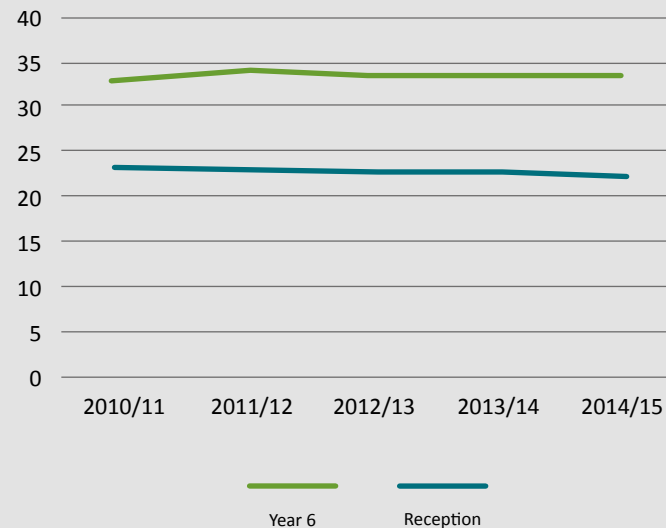
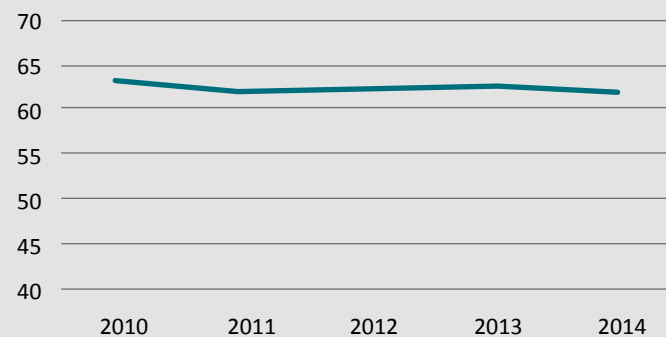


Figure 5: Prevalence of excess weight among adults in England (Health Survey for England) 2010-2014, %



Climate change commitments

In addition to making commitments on obesity, the UK has committed, along with most other countries of the world, to the goal of limiting the rise in global temperatures to less than 2° above pre-industrial levels. In 2008, the Climate Change Act was passed, committing the UK to reducing GHGE by at least 80% in 2050 from 1990 level, including emissions from the devolved administrations. As part of the Act, five-year carbon budgets are put in place (and have been put into legislation up to 2027) that cap the amount of GHGE during the specified period. So far, emission reductions comply with these caps. The government has also committed to increasing renewable energy. In the Renewable Energy Roadmap of 2011, (DECC, 2011) a comprehensive suite of targeted, practical actions are set out to help the government meet the EU 2020 target to produce 15% of energy from renewables, and ensure that the cost of renewable energy falls over time.

There are, however, no commitments to reduce meat consumption. The livestock sector accounts for just under 15% of global emissions, two-thirds of agricultural land is used for grazing or to produce crops destined for animal feed, and, as we showed in the previous section, meat and dairy product consumption are key contributors to the carbon and water footprints of UK diets. Chatham House research shows a sole focus on reducing emissions in the supply chain of meat and dairy products without addressing consumption will not be sufficient to the 2° target (Wellesley, et al., 2015).

Key findings

Typical family diets are not healthy, and deviate substantially on at least seven counts from what is recommended for optimal health and wellbeing: too much sugar, salt, saturated fat and red and processed meat; and too little fibre, fruit and vegetables, and oily fish. None of our family members met all seven dietary recommendations.

The situation is particularly worrying for sugar, fibre, and fruit and vegetables. This is not surprising when you see that 47% of calories eaten by primary school children come from high fat, sugar or salt foods, and 64% from ultra-processed foods; and our dietary preferences tend to be established in childhood.

Overall, our diets have, over time, become lower in fibre and vegetables, and lower in saturated fat, while our sources of sugar and meat have changed substantially. Non-alcoholic beverages have replaced table sugar as a major source of sugar, while chicken has replaced other types of meat as the major meat source. Processed food markets have been rapidly expanding. Diet is now the most important risk factor for death and illness in the UK.

Poor diets have a direct effect on the health of our family members: a third of five-year-olds in these families have dental caries; and by the time children reach secondary school, one in five of them are obese and one in 20 adults has diabetes.

Our diets are also associated with emissions of greenhouse gas equivalent to driving 5,000 miles per year, and water consumption equivalent to running 53 baths per day. Meat – particularly red meat – and dairy products are major contributors.

Healthier diets would reduce diet-related disease, greenhouse gas emissions and water footprints all at once.

Policy conclusions and recommendations

The government has made some commitments to tackle obesity in all UK nations with the most ambitious targets set in Northern Ireland. In England, the commitments have not started to deliver tangible results and a new childhood obesity strategy is currently being developed, led by the Department of Health.

In contrast, mandatory targets for reductions in greenhouse gas emissions continue to be delivered and the food sector is contributing to these reductions. However, there is no commitment to reduce meat consumption or integrate environmental sustainability into dietary recommendations, even though this will be critical to meeting the UK's commitments to reduce greenhouse gas emissions.

The government should set new targets for reducing excess weight and commit to a set of outcome measures which can be transparently monitored. It should endorse the Principles of Healthy and Sustainable Eating Patterns (Global Food Security, 2012) that have been developed by the government-sponsored Global Food Security Programme and integrate these principles into revised dietary guidelines.

Data gaps

Data on the diets of pre-school children is limited. This is a problem because nutrition in the early years has life-long impacts on health and productivity. These data gaps need to be addressed using national survey instruments.

The food our families eat, and throw away



Chapter 2

Where typical family food comes from and how much it costs appears

Our typical families spend 18% of their total weekly household expenditure on food and drink. This amounts to about £150 per week. Around two-thirds of this is spent buying food and drink to eat at home (£96.16) and one-third (£54.12) is spent on food and drink eaten outside the home (see Appendix Table 2). On average, lower-income families tend to spend a greater proportion of their total expenditure on food (21.4% for households in lowest-income quintile versus 13.7% for households in the highest-income quintile).

We consider food bought to eat at home, and food eaten out in a restaurant and at school. A significant gap in this picture is food bought on the go – picking up a chocolate bar at a petrol station, buying a bag of crisps at a newsstand or a biscuit at a coffee shop. Kantar Worldpanel, which tracks food expenditure, now devotes a separate database to this.

For food purchased to eat at home, Tesco, Asda, Sainsbury's and Morrisons together accounted for 70% of all retail purchases (see Appendix Table 2). Independent stores accounted for less than 5%. Since 2013, the market share has shifted slightly, with Waitrose, Marks & Spencer, Aldi, Lidl and bargain stores all gaining market share, and Tesco, Morrisons and the Co-operative losing market share.

In 2013, typical families spent approximately £32 on eating out in restaurants, cafés and so on, and £8 on takeaway food. They got just 13% of their total calories from food eaten out or from takeaway food eaten at home, even though they spent more than a third of their food and drink budget on eating out. This demonstrates the increased cost of eating out compared with eating at home. Previous data from the Living Costs and Food Survey 2013 suggest that, although consumers may be eating out more frequently, they are spending less. In real terms, expenditure on food and drink eaten outside the home fell by 5.6% between 2010 and 2013 (Bulman, et al., 2013). Horizons' data shows that the majority of UK meals eaten out in 2013 were in quick-service restaurants (QSRs), which



includes fast-food restaurants, cafés and takeaway outlets, where the customer generally pays when purchasing, followed by restaurants (outlets with table service). It is estimated that 2 billion meals were eaten in QSRs in 2013 – the same number as in restaurants, pubs and hotels combined (Horizons, 2014a). On average, people in Britain consumed 31 meals per year, or nearly three per month in QSRs, at an average cost of £5.72 per meal (Horizons, 2014a).

Data on the extent to which children in typical families are eating school meals is not readily available. The last survey of school food uptake was conducted in 2013/2014, before the introduction of universal infant free school meals (in September 2014) and the introduction of the new school food standards (January 2015). It showed that almost half of primary school children were eating a school lunch (see Table 5). The survey had too low a response rate to provide data on secondary school uptake.

Table 5: School lunch take-up in primary and special schools

	PERCENT OF CHILDREN
Overall take-up	42.6 (41.0–44.2)
Take-up of paid lunches	35.5 (33.8–37.2)
Take-up of free lunches	75.1 (73.1–77.1)

Source: Department for Education School Lunch Take-up Survey (2013/14)¹² (Department for Education, 2015)

The policy landscape has changed significantly since the publication of the 2013/14 School Lunch Take-up Survey. All infant pupils in England are now eligible for free school meals. On school-census day January 2015, 85.5% of infants took a school meal, including 87.7% of infants known to be eligible for free school meals through means testing, and 85.1% of infants not eligible for free school meals.

What typical families actually buy and eat

Retail purchases

Half of an average household's retail budget was spent on 20 categories of food (referred to here as 'the top 20'), and 90% on 80 categories (see Table 6). The two highest-spending categories are fruit and vegetables even though Chapter 1 showed that this was still not securing enough fruit and vegetables into our families' diets (Chapter 3 explores this further). The top 20 list includes a mixture of high-value items bought in small volume (e.g. £13.92 on wine, which may buy approximately three bottles a month), and low-value items bought in high volume (£10.28 on milk which will buy 40 pints). Of the supermarket budget, 18% was spent on meat products, and four of these categories appear in the top 20. Figure 6 breaks down the spend according to the same processed food categories used in Chapter 1 – not surprisingly, a similar proportion of spend (as we showed for calories in Chapter 1) is allocated to these foods.

“Half an average shopping bill goes on ultra-processed foods.”

Table 6: Top 20 products making up 50% of total average household spending on retail food and drink in 2013 (including alcohol)

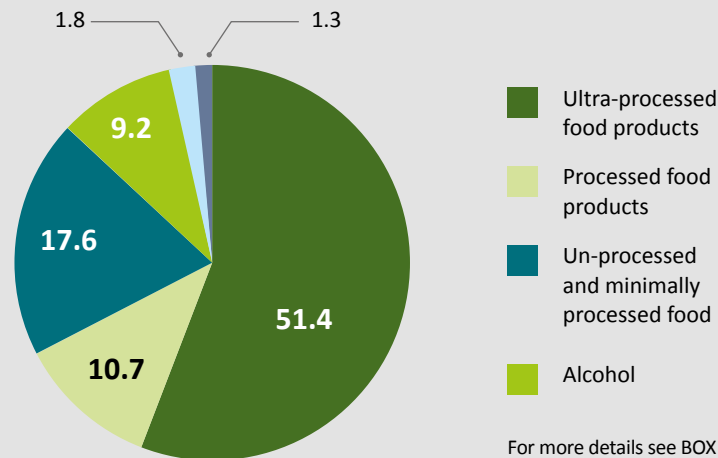
RANK	MARKET CATEGORY	BRAND LEADER**	AVERAGE HOUSEHOLD SPEND PER MONTH (£)
1	Vegetables (including potatoes)	Own label	17.17
2	Fruit	Own label	14.43
3	Wine	Own label	13.92
4	Milk	Own label	10.28
5	Spirits	Smirnoff Vodka	9.81
6	Cheese	Cathedral City	8.58
7	Biscuits	McVitie's	8.32
8	Chilled ready meals	Premium own label	8.11
9	Chocolate confectionery*	Cadbury's Dairy Milk	7.70
10	Fresh poultry	Own label	6.88
11	Beer and lager*	Stella Artois	6.87
12	Cooked meats	Own label	6.77
13	Bread	Warburtons	6.29
14	Fresh beef	Own label	6.28
15	Morning goods	Warburtons	5.79
16	Breakfast cereals	Kellogg's Crunchy Nut	5.18
17	Ambient cakes and pastries	Mr Kipling	4.68
18	Yoghurt	Müller Corners	4.44
19	Fresh bacon rashers	Own label	3.03
20	Crisps*	Walkers	2.97

Source: Kantar Worldpanel (2013)

*Only includes items that were taken home for consumption – Kantar Worldpanel has a separate database for food on the go.

**Brand leaders where they have a share (by value) over 10%.

Figure 6: Percentage of average household spending on processed foods





Eating out

When it comes to eating out, quick-service restaurant meals are the most popular and McDonald's is the QSR with the biggest market share. Annual food and drink sales for McDonald's UK were £1,870m in 2014, dwarfing the second largest, Yum! Group (including KFC, Pizza Hut eating out and takeaway), which had sales of £1,141m (data kindly provided by Horizons). We looked in detail at the McDonald's menu and found only 18 of the 57 food items on the menu and five of the 23 beverages contained levels of fat, sugar, or salt low enough to allow them to be advertised to children¹³. Only seven main-course items do not contain meat (see Appendix Table 3).

School meal

The children in our family both have access to a school meal, but as we showed above (Table 5), uptake among children above Key Stage 1 is quite limited, and many children eat packed lunches. The government introduced New School Food Regulations in England in 2014 (Department for Education, 2014) to provide and promote healthy food choices. Similar

regulations have been established in Scotland, Wales and Northern Ireland. The regulations aim to make the food offered at lunchtime healthier by increasing the vitamin and mineral content, and decreasing the fat, saturated fat, sugar and salt content. Provision or sale of fizzy drinks, crisps, cakes or biscuits are banned throughout schools, and either fruit or vegetables have to be available at points where food is served in school.

In Box 5, below, we provide a snapshot of a school meal provided by GS Plus for schools in Greenwich Borough and Kent on 10 November 2015. It describes the elements of the School Food Standards that are mandatory for schools in England to ensure the nutritional value of the meal. The standards are compared to data on packed lunches gathered through a cross-sectional survey, which showed that only 1.1% of packed lunches met the food-based school standards in place at the time of the study (Evans, et al., 2010). GSPlus who provides the meals to Greenwich has a strong commitment to sustainable sourcing (see Box 6) and is also supporting lower consumption of meat, by regularly offering meat-free menus

“The government introduced New School Food Regulations in England in 2014 to provide and promote healthy food choices.”



Box 6 shows how strong government policy can be enhanced by excellent school meal providers and school leadership to create a school environment which puts good food and healthy eating at the centre of school life. This offers opportunity to make life-long impacts on children’s attitudes to food and also improve the uptake of school meals.

Box 5: School meals, School Food Standards, and packed lunches side by side

CHARLTON MANOR SCHOOL MEAL 10/11/15	COMPARISON WITH SCHOOL FOOD STANDARDS REQUIREMENTS	COMPARISON WITH PACKED LUNCHES (2009 DATA)
Mains: Chicken tikka masala with rice Tuscan bean and pasta bake Jacket potato with tuna and sweetcorn	Schools must provide a non-meat protein option (meat, fish, eggs or beans) every day. Vegetarians should be provided a non-dairy protein at least three times a week.	3.5% of lunchboxes contain savoury dishes (e.g. pasta/chicken dish) permitted in the previous food-based school standards. 60% of lunchboxes contain savoury snacks (e.g. crisps).
Sides: Garden peas Cucumber raita	Schools must provide vegetables or salad as an accompaniment daily. Schools advised to use yoghurt or other lower-fat options instead of mayonnaise.	19% of lunchboxes contain vegetables or salad.
Dessert: Fresh melon fest Fresh fruit platter Organic yoghurt	Schools must provide a dessert containing at least 50% fruit at least twice a week. Schools cannot provide confectionery, chocolate or chocolate-coated products throughout the school day.	54% of lunchboxes contain fruit. 63% of lunchboxes contain confectionery. 61% of lunchboxes contain sweetened drinks, not permitted in the School Food Standards.

BOX 6: BEYOND SCHOOL FOOD STANDARDS

Many schools provide lunches of a quality beyond those required by the School Food Standards. Thirty per cent of English Schools currently receive school meals accredited with the ‘Food for Life Catering Mark’ (Soil Association, 2015a). This graded award sets standards for caterers on sustainable and local sourcing, improving animal welfare and using fresh ingredients. The Food for Life award criteria generally exceed requirements of Government Buying Standards (DEFRA, 2014).¹⁴

We visited a state primary school well known for its exemplary work on school food: Charlton Manor in Greenwich, London.

GS Plus is the Royal Borough of Greenwich caterer and holds the Gold Food for Life Catering Mark accreditation for two schools within Greenwich, Silver Food for Life Catering Mark for 76 Greenwich schools, Good Egg/Good Chicken awards and Good Dairy Commendation from Compassion in World Farming; MSC Chain of Custody accreditation; and Red Tractor accreditation.

Importantly, ‘school food’ does not narrowly equate to ‘school meals’ at Charlton Manor. Through community gardens, two ‘teaching cooks’, a ‘teaching gardener’ and a dedicated kitchen classroom, food and health education is fully integrated across the curriculum. Pupils and the wider school community can also help tend a working kitchen garden and farm, and benefit from a range of extracurricular activities outside of core teaching hours. Charlton Manor is a recipient of a Gold Food for Life School Partnership Programme: these awards consider the quality of school catering (against the Food for Life Catering Mark), alongside school leaderships’ commitment to embedding food across curricula and building links with local food systems.

Funding concerns may prevent schools from attempting to replicate the approach found at Charlton Manor. However, Charlton Manor has a reliance on self-generated income only 0.2 percentage points higher than the national average (3.2% of total income is self-generated), suggesting core grant funding could be used to adopt similar measures.

Throwing away food

While our typical families spend almost 20% of their weekly budget on food and drink, they also throw a lot away. It is estimated that 15 million tonnes of food waste (food and drink) is produced annually in the UK (Whitehead, et al., 2013). DEFRA statistics show that the largest source of food waste in the UK is from households: equivalent to 63% of all food waste or 7.2 million tonnes per year (DEFRA, 2013b). UK households throw away 4.2 million tonnes of avoidable¹⁵ household food and drink annually, which is the equivalent of six meals every week for the average UK household. For an average household with children, the cost of such waste equates to £700 each year, or 9% of our typical household's expenditure on food and drink. It is important to note that this represents a decline of 24% over the last five years (WRAP, 2015a). The avoidable waste for each of the top 20 product categories in our family's shopping basket is shown in Appendix Table 4. Vegetables, salad, fruit, fresh poultry and chilled ready meals were the categories with the highest-value waste.

Waste not only adds to the cost of food for our family, but it also contributes to its environmental footprint. Almost 3% of all our GHGE in the UK came from waste being disposed in landfill in 2013 (DECC, 2015). Local authorities collect 4.6 million tonnes of food waste every year and 3.1 million tonnes goes to landfill; 1.6 million tonnes per year is disposed of through the sewerage system.¹⁶ The Local Government Authority (LGA) estimates that disposal of food waste by composting costs £115 to £200 million a year, and it costs £390 million for landfilling (WRAP, 2015a).

The UK government has committed to a 'zero waste' economy. UK waste policy is mainly driven by the *EU Waste Framework Directive* (European Commission, 2015a) and food waste is a devolved issue. In Scotland, Wales and Northern Ireland, regulations require some forms of food waste to be collected separately for anaerobic digestion rather than landfill (Government, 2012) (Government, 2010), (Government, 2015). In England, the government is currently looking to voluntary initiatives such as the Courtauld Commitment and LoveFoodHateWaste campaign, rather than legislation to deliver reductions in food waste (Government, 2014a).

Key findings

- Typical families spend about £150 on food and drink. They spend two-thirds of this on supermarket food, 70% of which is bought in Tesco, Asda, Sainsbury's or Morrisons. Families spend 51% of their shopping budget on ultra-processed food and about 18% on unprocessed and minimally processed food.
- Families are spending 18% of their weekly expenditure on food and drink, and this figure is even higher for low-income families. However, they also throw away the equivalent of six meals every week through avoidable food waste. Waste is highest for fruit and vegetables, which starts to explain why expenditure on these is high, but consumption is too low. Reducing food waste would improve the purchasing power of our family's food budget.
- One-third of family food and drink expenditure goes on eating out and this spending is declining (for more on this, see Chapter 3). Quick-service restaurants are the most common place to eat out, and analysis of the market leader's menu shows that the majority of items available are not healthy.
- Unless they are under 7 years, the primary and secondary school age children in our family have less than a 1:2 chance of eating a healthy school meal, and instead take a packed lunch. Packed lunches are typically much less healthy and the low uptake of school meals is a missed opportunity for improving children's diets.

Policy conclusions and recommendations

- Retail food purchases are the most important source of food for our typical family and absorb considerable family expenditure. Accelerated government support for initiatives on household food waste will cut greenhouse gas emissions and local authority costs, and increase the purchasing power of the family's budget so they can potentially buy more food of a higher nutritional value.
- Eating out is an important source of calories, but eating out cheaply often means eating unhealthily. Incentivising food businesses to provide low-cost, healthy eating-out options

should be a key priority in the government's forthcoming childhood obesity strategy. One place to start would be to make Government Buying Standards (DEFRA, 2014) mandatory for all public procurement. Currently, they only apply to a small proportion of government procurement and are not complied with (Public Health England, 2015). The plan sets standards for making food procured healthier and more environmentally sustainable. Importantly, these standards create incentives for suppliers, which may have positive knock-on consequences for other food service providers outside the public sector.

- School food has a strong policy framework in place, overseen by the Department for Education, and in combination with voluntary schemes such as the Food for Life Mark and strong leadership from governors and head teachers, these policies provide a platform for embedding healthy eating within school life. The work of the School Food Plan is critical for galvanising and supporting this leadership. However, Ofsted school inspection framework (Ofsted, 2015) pays minimal attention to eating at school and there is no requirement for inspectors to visit the canteen or eat a school meal. Schools are, for the most part, incentivised by Ofsted inspections so including strong criteria on food in inspection criteria would help to ensure the benefits of school food policy are maximised and could support uptake of school meals.

Data gaps

- There is very little data available on school meal uptake for children above age seven years, particularly secondary school children. This is a significant gap, which is important to fill in order to know how many children are benefiting from the investments made in improving school meals.
- There is also very little data available on how people eat when they are at work – how reliant they are on eating out, compared with bringing lunch from home or eating in staff canteens. Improving food at work is an obvious route towards improving adult diets, and offers obvious benefits to employers and workforce productivity.

The food environment: drivers of food choice



Chapter 3



In this chapter, we review the factors in the food environment that affect our family's choices. The food environment comprises all the everyday prompts which nudge our family's choices in particular directions, but which also help create habits and food preferences particularly in children, which can have long-term impacts (Hawkes, et al., 2015). We first look at convenience and how easy it is for our family members to get hold of food, and at how advertising reaches and influences them, before they have even stepped into a shop or restaurant. We then consider the factors which consumers themselves report as important in influencing their grocery shopping or eating out choices. Figure 7 shows the results from the IGD ShopperVista survey, which reflects the responses of a representative sample of grocery shoppers (DEFRA, 2013b). Horizons' research shows similar factors affect decisions on where to eat out: the quality of the food comes first, then price, followed by cleanliness (personal communication). We consider these factors under the following headings: price and promotions, labelling and formulations.

Convenience

It has become more convenient to buy food. We eat much of the food we buy on the day we buy it. On average, households shopped 4.5 times per week¹⁷ in 2013, spending about £14 per trip and buying about 10 items. The overall number of food and drink stores has increased slightly over the last ten years but the types of store have changed. The number of food and drink stores with 50 employees or more has remained largely the same over the last 10 years, increasing by only 2%. However, over the same period, the number of small food and drink stores (retail units with fewer than 10 employees) has decreased by 6%, while the number of larger stores (10-50 employees) has increased by 33%. This suggests that small/local supermarket outlets have replaced smaller food and drink stores and are also accounting for the overall growth in numbers¹⁸. This, of course, may have good and bad consequences: it may help families cook more fresh meals, or it may result in more impulse buying.

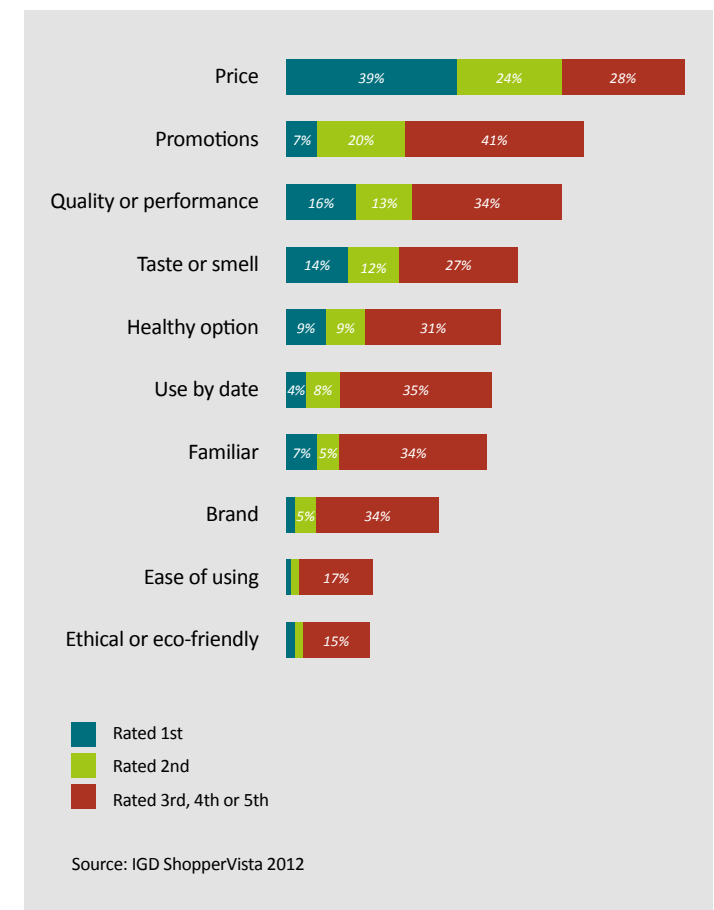
While it has become easier to buy supermarket food, it has become a lot easier for our family to eat out. The number of eating-out sites has increased by 53% from 60,760 to 93,285 over the last 10 years and now there are an estimated 1.4 establishments per 1,000 population in the UK¹⁹. In 2013, people in the UK ate out a little less than once a week, but are now eating out more than they were, despite the food service being affected by the recession (Horizons, 2015). There is some evidence to show that takeaways have proliferated in more deprived areas (Maguire, 2015).

As noted in Chapter 2, on average, households eat more in quick service restaurants and there is a growing body of evidence that fast-food consumption increases calorific intake (Rosenheck, 2008),

intake of unhealthy products (Fleischhacker, et al., 2011) and obesity rates (Holsten, 2009). Some studies have also found that fast-food consumption and geographic proximity to quick-service restaurants is associated with other negative health outcomes such as decreased intakes of fruit and vegetables (Fraser, et al., 2010). Numerous studies have also found a positive association between the availability of quick-service restaurants and the level of deprivation in the local area (Fraser, et al., 2010), suggesting the growth of the industry could contribute to widening health inequalities.

For these reasons, there is a strong rationale for planning regulations to control the proliferation of eating-out establishments that serve unhealthy food, particularly in places frequented by children. Since 2012, local authorities have been required to develop Local Plans within the guidance provided by the National Planning Policy Framework, which makes it clear that local planning authorities in England have a responsibility to promote healthy communities. In England, independent inspectors review the Local Plans on behalf of the Secretary of State for Communities and Local Government. Similar national frameworks and laws exist in Scotland, Wales and Northern Ireland. Public Health England advises local authorities to use the legal system and planning laws to regulate the growth of fast-food restaurants (Public Health England, 2013), but this has had mixed results. For example, two neighbouring London boroughs – Lewisham and Royal Greenwich – both attempted to include planning restrictions on new-fast food outlets within 400m of schools in 2014. This element of Lewisham's plan was approved (Lewisham Council, 2014) while Greenwich's was rejected (Greenwich Council, 2014).

Figure 7: Factors influencing consumer product choice⁸



Advertising

Food and drink advertising reaches our family members through multiple channels and is heavily skewed towards unhealthy foods. Nielsen reports that the three main categories for above-the-line food and drink advertising are soft drinks, chain restaurants and food. Within food advertising, the two largest categories are prepared convenience foods and confectionery which together amount to 60% of food advertising spend, while fresh fruit, vegetables and pasta account for 3% (OFCOM, 2003).

There are two restrictions on advertising in relation to food. First, the 2010 Ofcom UK Code of Broadcast Advertising (BCAP Code) (CAP, 2014) has a section specifically on Food and Soft Drink Product Advertising to Children, which bans television advertising of products high in fat, sugar or salt (HFSS), including soft drinks, during programmes commissioned for, or likely to appeal to, children under the age of 16. The criteria for defining these products is the same as that used in Chapter 1, Table 3, which showed that, in spite of this regulation, nearly half of all calories consumed by children in typical families come from these foods. This is perhaps not surprising when OfCom's own study after the ban showed that 71% of children's viewing time was outside children's air time (Ofcom, 2010).

A review that compared exposure before and after the ban found that, despite good adherence to the restrictions, children's relative exposure to HFSS food and drink adverts did not change (Adams, et al., 2012).

Second, the UK Code of Non-broadcast Advertising, Sales Promotion and Direct Marketing (CAP, 2010) also came into force in 2010, stating that marketing communications 'must not condone or encourage poor nutritional habits or an unhealthy lifestyle in children, should not encourage frequent eating between meals, eating immediately before going to bed or excessive consumption, and should not condone or encourage attitudes associated with poor diets or unhealthy lifestyles, e.g., skipping meals, a dislike of green vegetables'. Given that poor nutritional habits and unhealthy lifestyles are not defined, this means that much food and drink advertising beyond children's TV viewing slots including advergames and internet-based promotions, is hardly regulated. Furthermore the current regulative framework does little to prevent advertising attached to corporate sponsorship agreements. Since 2010, Coca-Cola alone has provided close to £6 million in funding for Special Olympics GB, the StreetGames project – which specifically targets the most deprived areas in the UK – and the ParkLives programme (Coca Cola, 2015). Such sponsorship deals may be extremely attractive to local authorities, and other government institutions struggling to provide finance for sports programmes. However, they allow manufacturers of HFSS, and other unhealthy food products to promote their products, and associate their brands with healthy lifestyle choices.

Price

Shoppers say price is the most important factor driving their food choices (see Figure 7). However, an item's perceived value (quality and performance in Figure 7) is also an important driver and one that the industry uses in marketing (Hawkes, 2012). In the UK, food prices rose by 11.5% between 2007 and their peak in June 2012 as measured by the Consumer Price Index, although there have been gradual price reductions since 2013. In real terms, prices are now 8% higher than they were in 2007 (DEFRA, 2015a). Here, though, we're particularly interested in whether there are any price incentives for our typical families to buy less-healthy food.

Starting with food bought to eat at home, research shows that healthy foods and diet patterns are more expensive. A systematic review and meta-analysis of 27 studies showed that within major food groups (such as meats and proteins or snacks and sweets), per-calorie and per-portion comparisons showed healthier foods to be more expensive. The biggest differences were for meat and protein. Similar results were shown when dietary patterns were compared: the healthiest diet was \$1.48 per day more than the least healthy, although some comparisons showed no differences. Studies conducted since in the UK show similar findings (Monsivais, 2015)

Figure 8: Mean price of food (£/1,000kcal) by food group

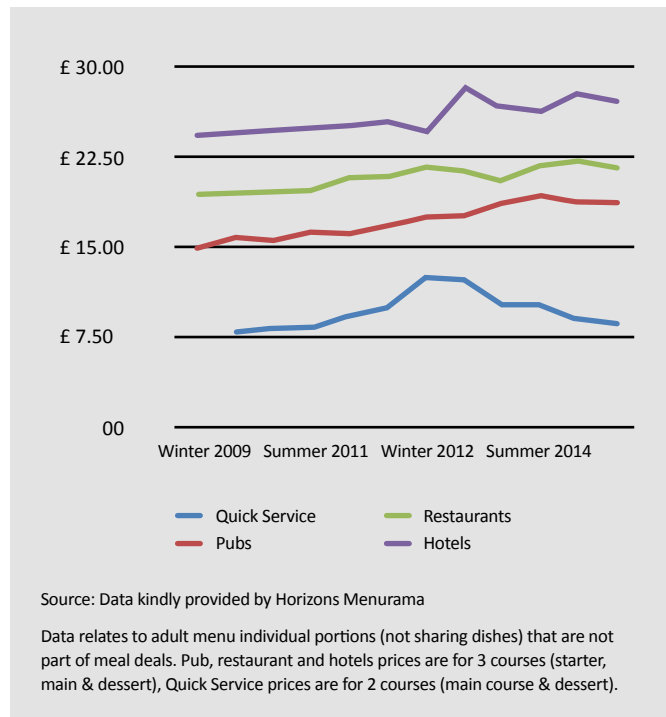




In a study of UK prices (Jones, et al., 2014), with the exception of core staple foods (bread, rice, pasta, potatoes), foods and drinks that are high in fat and/or sugar were shown to be the lowest-cost providers of dietary energy. More healthy foods were three times more expensive than less healthy foods (see Figure 8). Importantly, this research also showed there is a growing price gap between them. A similar study compared the relative price of ultra-processed food with minimally processed foods or processed culinary ingredients (see Chapter 1). It showed that the former was 13% cheaper on average than the latter (Moubarac, et al., 2013).

For food eaten out of the home, quick-service restaurants offer the cheapest meals - £10 cheaper than pubs, restaurants or hotels, for an average meal. Moreover, prices appear to be coming down in contrast to other types of eating-out establishment (see Figure 9).

Figure 9: Average meal price – eating out



From our analysis of the McDonald’s menu, the cheapest healthy meal is more than double the cost of the cheapest meal. The cheapest healthy meal still includes a third of an adult’s daily salt, just less than a third of sugar and only 10% of fibre needed for a healthy diet. The meal offering the greatest financial saving, through a ‘meal deal’, involves eating 1,144 calories (see Appendix Table 5).

There are currently no government controls to regulate the price of food. However, the government does impose VAT in the UK on some foods (HMRC, 2014) if they are deemed to be ‘non-essential’. This means some healthy foods such as mineral water and cereal bars have VAT of 20%, while some foods that may be high in fat, sugar or salt do not. These include chilled or frozen ready meals, cakes, some biscuits (e.g. bourbons, chocolate-chip cookies, millionaire’s shortcake), some desserts (e.g. baked Alaska, cream gateaux), drinking chocolate, milkshakes and some savoury snacks (e.g. tortilla chips). VAT is charged at 20% on all hot food supplied through catering, including hot takeaway food.

There have been widespread calls from academics, the medical profession and campaigners for a 20% tax on sugary drinks given the evidence from other countries that it can reduce sugar consumption. Sugar sweetened beverages are the biggest source of sugars in our diets and consumption is associated with increased risk of type 2 diabetes and in children results in greater weight gain as well as the well-known risk of tooth decay. Public Health England also recommends a tax or levy as part of a suite of measures to curb sugar consumption. In practice, given that sugary drinks are currently VAT rated at 20%, an excise duty (based on volume rather than price) would need to be introduced, indexed to inflation as with tobacco and alcohol.

Government policy and budget commitments have made healthy school meals free for every child in reception, Year 1 and Year 2 in state-funded schools in England through the Children and Families Act 2014 (Government, 2014b). We showed in Chapter 1 that this has significantly improved the

uptake of healthy lunches by infants. The Scottish government started to support free school meals for children in primary one to three from January 2015 (The Scottish Government, 2015). Children aged four to seven years in Northern Ireland are not eligible for free school meals at the present time. All primary schoolchildren in schools maintained by the local authorities in Wales are entitled to a free school breakfast (Government, 2013). A School Fruit and Vegetable Scheme (Department of Health, 2010) was introduced across the UK in 2004 allowing infants in state-funded schools to receive a free piece of fruit or vegetable every school day as part of the five-a-day programme. In addition, as of January 2015, schools across the UK are legally required to ensure free, low-fat milk is made available during the school day for children of all ages who are eligible for free school meals. The School Milk Subsidy Scheme introduced by the EU allows schools, local authorities, suppliers or organisations to apply for EU subsidies, supplemented by the UK government, for school milk (Government, 2014c).



Promotions

Families in Britain buy on promotion! Promotions in Britain are the most prevalent in Europe, and 40% of our expenditure on food and drink consumed at home come from foods on promotion (Public Health England & Kantar Worldpanel UK, 2015). New research reported that more unhealthy than healthy foods are discounted, promotions cause us to buy one fifth more than we would otherwise, and cutting promotions on high-sugar foods and drinks could reduce our sugar consumption by 6% (Public Health England & Kantar Worldpanel UK, 2015). In contrast, research from Cambridge University found that UK supermarkets were not more likely to promote less-healthy foods over healthier foods. However, price promotions were more likely to lead to an increase in sales of less-healthy foods, which may be due to less-healthy foods being non-perishable, leading to stockpiling during a promotion (Nakamura, et al., 2015). There are currently no government regulations limiting promotions on HFSS foods.

Labelling

Studies have shown that food labels have some – but not much – influence on consumer choices (Knai, et al., 2015). EU legislation sets out the information that must be on food labels with respect to nutrition content (European Parliament, 2014) and health and nutrition claims (European Parliament, 2006). The voluntary Front-of-pack (FOP) labelling scheme was introduced in the UK as part of the Public Health Responsibility Deal in 2013 (Department of Health, 2013), including the inclusion of colour coding for fat, saturated fat, total sugars and salt using red, amber and green (traffic lights). Seventy-five per cent of products now sold carry FOP traffic light labelling (House of Commons Health Committee, 2015).

Generally, larger retailers have adopted the colour-coded traffic light labels on their pre-packaged products. Sainsbury's, Tesco and Asda display traffic light labels on their own-branded food and drink products. Morrisons is currently rolling out traffic light labels to all of its pre-packaged products, starting with products such as pies and pastries, ready meals, pizzas and sandwiches. Many branded products, however, do not use traffic lights or use them in black and white.

We conducted a 'labelling snapshot' and reviewed the labels of four processed food categories in the "top 20" on sale in the four biggest retailers (see Chapter 2). There was a wide variation between retailers and product categories on the use of FOP labelling linked to the retailer's policy on the use of traffic lights and the extent to which branded items were a major contributor to the category. Less than a third of yoghurts but almost 90% of ready meals had FOP nutrition labels (see Table 7).

Table 7: Labelling of 4 products categories in four major retailers

	Ready meals (n=411)	Breakfast cereals (n=305)	Yoghurts (n=267)	Bread (n=191)
Retailer	Sainsbury's	Tesco	Morrisons	Asda
% Products with FOP nutrition labels	89	67	31	80
of which:				
Colour traffic lights (%)	89	56	16	95
Black and white (%)	11	43	57	5
Single energy label (%)	0	0	27	0
% Products with a nutrient claim	33	64	73	34
of which:				
High level of ≥ 1 Front of Pack nutrients*	23	60	5	2

*FOP nutrients = fat, saturated fat, sugar and salt.

The thresholds for each nutrient on FOP labels were initially developed by the Food Standards Agency. However, since these were developed, new guidance on the recommended amount of sugar in our diets has been published, making the thresholds for sugar out of date. It is possible for a 100g product (such as a yoghurt) to achieve an amber/medium mark for total sugar, yet still provide almost the entire daily requirement of added sugar for a primary school age child.

There are three further problems with labelling. First, it is possible for a product to have a nutrient claim, such as "low fat", and have unhealthy levels of other nutrients such as sugar which show red on traffic light labelling. Two thirds of breakfast cereals had health or nutrient claims (such as whole grains or a source of fibre), but of these almost two thirds were high in fat, saturated fat, sugar or salt.

Second, a traffic light label needs to present the percentage contribution to the adult's reference intake of each specific nutrient and for this a portion size has to be stipulated. Currently, no legislation within the EU or UK provides guidelines on portion size. EU legislation only requires that the food portion be easily recognisable and quantified on food labels. We found that the portion sizes used to code nutrition labels on our sample of breakfast cereals, yoghurts and ready meals varied within each product category (e.g. 30g to 60g for cereals; 40g to 200g for yoghurts; 100g to 450g for ready meals). British Heart Foundation research highlighted discrepancies between portion size information on products and what is actually consumed, and found that the average portion size of breakfast cereal served by consumers was 44g, despite the majority of traffic light labels being based on portion sizes of 30g (British Heart Foundation, 2013). This lack of cohesion produces consumer uncertainty: over 50 per cent of consumers report that nutritional information is hard to understand (Chartered Institute of Marketing, 2014).

Box 7: Difficulties interpreting labels



50g contains				
Energy	Fat	Saturated	Sugars	Salt
790kJ (190kcal)	2.5g	0.5g	12.1g	0.1g
9%	4%	3%	13%	2%

of the reference intake*
Typical values per 100g: Energy 1480kJ/351kcal

Per portion 30g				
Energy	Fat	Carbohydrate	Sugars	Salt
237kJ (57kcal)	1.2g	0.5g	7.6g	0.17g
6.0%	2.0%	3.0%	8.8%	3.0%

of an adult's RDI*
Per 100g: 1610kJ/381kcal
*Reference intake of an average adult (8400kJ/2000kcal)

Tesco Finest Super Berry Muesli 500G Nestle Nesquik Cereal 375g

INTERPRETATION PROBLEMS: First, the levels of each FOP nutrient are based on different portion sizes (30g versus 50g) meaning that relative levels of a particular nutrient cannot be easily compared. Second, despite both of the cereals containing high levels of sugar per 100g, the lack of colour coding on the Nesquik cereal makes it difficult to identify the cereal as high in sugar.

“Two thirds of breakfast cereals had health or nutrient claims, but of these, almost two thirds were high in fat, saturated fat, sugar or salt.”

Third, date labelling is important in considering our family’s level of household waste (DEFRA, 2011). Government guidance for the UK on the application of date labels to food is in accordance with the EU regulations. There are two types of durability indication:

- ‘best before’ is the period for which a food can reasonably be expected to retain its optimal condition (e.g. it will not be stale) and so relates to the quality of the food.
- ‘use by’ is the required form of date mark for those foods that are highly perishable from a microbiological point of view and are in consequence likely after a relatively short period to present a risk of food poisoning, and so relates to the safety of the food.

In practice, a display until or sell by date often appears next to the best before or use by date. These are dates used by retailers for stock monitoring, but are open to misinterpretation by consumers and government advice to food businesses is to remove these dates to avoid confusion.

When it comes to eating out, the Food Standards Agency launched a programme in 2009 to develop a calorie-labelling scheme for the catering industry in the UK. This was included as part of the government’s Responsibility Deal (see Chapter 1). Restaurants, quick-service restaurants, takeaways, cafés, pubs, sandwich shops and staff restaurants were invited to sign up for a voluntary pledge to ‘Provide calorie information for food and non-alcoholic drink for their customers’. To date, 45 companies/retailers have signed up, including many fast-food chains such as Kentucky Fried Chicken, McDonald’s, Pizza Hut and Subway. A total of 9,845 outlets are currently reported as providing out-of-home calorie labelling (Department of Health, 2014). This represents a little over 10% of the 93,285 restaurants and mobile food service activities registered in the UK in 2015 (ONS, 2015).

Hygiene in food preparation is a particular concern when we choose where we eat out and is ranked the third most important factor in our choice of where to eat, but currently it is not easy for our family members to identify the hygienic options. The Food Hygiene Rating Scheme requires that all food premises are inspected by the local authority and rated for hygiene standards on a score of 0 (lowest) to 5 (highest). We analysed the FSA database on hygiene ratings and found that 15% of takeaways and sandwich shops required improvement in England, Wales and Northern Ireland, and 22% in Scotland (see Appendix Tables 6-7). Businesses do not, however, have to display their rating in England or Scotland, which means unless the business voluntarily displays the sign or the customer looks up the business online, they will not be able to see the hygiene score. In Wales and Northern Ireland, it is mandatory for businesses to display their rating.



“Promotions are steering us towards unhealthy foods and leading us to buy more sugary foods than we would otherwise.”

Formulations

We also looked at how many healthy options were available in the four popular food categories for our families. Fewer than 5% of products in all product categories had low levels of all sugars, salt and fats. Half of all breakfast cereals and ready meals had high levels of at least one FOP nutrient. The situation was much better for bread and yoghurts (see Table 8). Seventy-one per cent (293) of ready meals contained meat and another 9% (36) contained fish.

Table 8: Healthy options in four major product categories

	Ready meals available in Sainsbury's (n=411)	Breakfast cereals available in Tesco (n=305)	Yoghurts available in Morrisons (n=267)	Bread available in Asda (n=191)
% products with one or more red rating	55	45	15	2
% products with all green ratings	3	2	2	0

Although FOP nutrient labels provide cut-offs for high levels of fat, saturated fat, sugar and salt, there are no regulations on upper limits for these nutrients. We found a number of products that contributed to nearly all or more than the recommended levels for some FOP nutrients. For example,

- Sainsbury's Free from Beef Lasagne 400g contains 16.4g of saturated fat, contributing to over 80% of the daily reference intake for an average adult (consuming 2,000kcal per day)

The same problem applies for food eaten out. When we reviewed the McDonald's menu, we found, for example, that:

- the Big Tasty (a beefburger sandwich) exceeds the recommended intake for saturated fat for women (21g per portion) and has over half the recommended 6g per day of salt for adults
- all the McFlurry's ice cream desserts contain between 44g and 50g total sugars in a single portion. Assuming these ice creams have a similar ratio of milk and sugar as Cornetto-type ice cream analysed in standard nutritional tables, then added sugar is at least 38g to 44g of the total, which is well above an adult's daily recommended amount of 30g.



Key findings

Many factors act against typical families making healthy choices when they buy food and eat out:

- Advertising is heavily focused on unhealthy foods and is targeting children through multiple channels
- Price: with the exception of key staple items, unhealthy foods are generally cheaper, calorie for calorie. Average prices for quick-service restaurants compared with other types of eating out are almost the same as they were five years ago and are on average £10 cheaper than pubs, restaurants and hotels.
- Promotions are steering us towards unhealthy foods and leading us to buy more sugary foods than we would otherwise
- Labelling is extremely confusing for our family, with traffic lights being inconsistently applied, nutrient claims being used on unhealthy products and portion sizes making interpretation of labels difficult. Sell-by and display-until labels have the potential to contribute to household waste. Calorie labelling in restaurants is voluntary, as is displaying the hygiene rating (in England and Scotland)
- Formulations: there is a notable lack of healthy choices within some product categories such as breakfast cereals and ready meals, and within a typical quick-service restaurant menu and some products have extremely high levels of certain nutrients.

Policy conclusions and recommendations

- The number of eating-out establishments has increased by 53% in the last 10 years and there are now more places to eat out than there are shops to buy food in. Quick-service restaurants often serve cheap, unhealthy food and we need a range of measures in place to incentivise food service providers to provide healthier food (see Chapter 2). Planning regulation is only one of these measures, but, given the strength of evidence and existing guidance from Public Health England, having consistent decision-making by local government and planning inspectors on fast food outlets around schools would be an easy win.

- Expanding the advertising ban on foods with high fat, sugar or salt. Broadcast advertising of food and drink is regulated for children's viewing times, but the scope is so narrow that it is not having an impact on their exposure to adverts of high fat, salt and sugar foods. Instead, it should be applied to all broadcast advertising before the 9pm watershed.
- The principles already captured in the Non-broadcast Advertising Code of Practice need to be developed into a clearer marketing code for HFSS that covers all forms of marketing beyond broadcast including digital channels and including promotions and sponsorship. This could build on the experience of the marketing of breast milk substitutes, which has a long history and is in place to protect breastfeeding from being undermined by commercial imperatives to sell infant formula.
- Pricing needs to be addressed. A 20% excise duty on sugary drinks should be introduced, indexed to inflation. The fact that there are diet equivalents of most sugary drinks would make this tax less regressive. In addition, using VAT to support healthy choices should be considered. VAT could be placed on some zero-rated foods that are unhealthy, once the current VAT lock is lifted in 2020, and lowered to the discounted rate for some healthy foods currently rated at 20%.
- Labelling. We show in this report that labelling is problematic on many counts and this needs to be addressed. Front of pack traffic-light labelling is not mandatory and there are no official guidelines on portion size. There is also a voluntary approach to menu calorie labelling so many eating-out establishments do not do this. The European Commission oversees labelling, and while the process of getting this agreed with the European Union may be slow, there needs to be concerted government action, working together with like-minded member states to deliver the best labelling to help consumers make healthy choices. Displaying hygiene ratings in eating-out establishments should be made mandatory in England and Scotland.

- Setting upper limits for formulations of processed foods. We found many examples of foods that exceed in one portion the daily allowance of specific nutrients. This should be stopped. The Food Standards Agency has a strong history of working effectively with the food industry to ensure set targets for salt reduction and reformulation. This work needs to be re-invigorated and expanded to cover food service and catering as well as supermarket food. It should be backed up by a real threat of legislation.



The food system: drivers of food price



Chapter 4



This chapter looks in more detail some of the typical items in our family's shopping basket: fresh meat, a yoghurt and potatoes. Given the importance of price in determining consumer behaviour, we briefly trace the journey of these items from farm to shop (although we were unable to get this information from the yoghurt manufacturer). We then examine some of the cost drivers for the item and how government policy measures affect these cost drivers. This analysis is intended to illustrate rather than be comprehensive, and point towards the sort of action that could be taken to incentivise a re-balancing of the price of our typical family's food.

We chose these three items because we have shown in Chapter 1 that we are eating too much meat, too few vegetables, too little fibre and too much sugar and processed food. The items we have chosen are all brand leaders for the four categories in the "top 20" list. Where the brand-leader was an supermarket own-brand item (in the case of meat and potatoes), we randomly allocated these to the major supermarkets weighted by market-share. We have researched these items using a combination of key informant interviews, desk-based research and government statistics.

Whole chicken and minced beef

Our family members overall protein consumption is much higher than it needs to be. Meat accounts for 20% of their retail spending and is the major contributor to saturated fat in their diets. They are eating too much red and processed meat, which has been directly linked to colorectal cancer. In addition, the meat in their diet contributes significantly to the environmental and water footprint of their food. In this section, we examine what is driving the cost of chicken and beef by tracing a 1.39kg whole chicken and 500g pack of beef mince purchased from Asda back through the food system.

The journey

Chicken

The chicken was a Ross 308, the world's number-one broiler breeder brand. The parent stock was bred by Aviagen the world's largest poultry breeding company, which owns 50% of the world's market share for breeding stock (second, is Cobb-Vantress, which owns a further 40%²⁰). It was hatched in one of 10 hatcheries owned by P D Hook. The one-day-old chick was then transported to Upton South Farm (owned by the Hook2sisters Limited joint venture), where it was reared in a barn and fed on wheat and soy and treated with antibiotics²¹. When the chicken was 35 days old, it was transported to Flixton site (owned by the 2 Sisters Food Group), where it was slaughtered, sealed and labelled, weighing 1.39kg. Six days later, it was bought from Asda.

Beef

Our beef mince originated on farms in Northern Ireland. It came from a batch of 60 cows coming from a number of farms in Northern Ireland. Sometimes these cows were born and reared on the same farm; others may have been born and reared on up to four farms. They had been fed a combination of purchased and home-grown feed and forage. ABP Food Group bought the cattle when they were approximately 24 months old²² and weighing around 600kg (liveweight) (Agriculture and Horticulture Development Board, 2015a). Cattle that are reared for longer, require less feed and more forage, which pushes down costs. However, these costs are offset by labour and other costs associated with longer rearing duration. ABP is the leading beef processor in the UK and Ireland and the third largest meat processing company in Europe. ABP slaughtered the cattle at the ABP plant in Lurgan, Northern Ireland, and then transported them to the ABP Doncaster plant for processing and packing into mince. Mince is predominantly meat from the forequarter of cattle. There are up to 24 days between slaughter and the use-by date on the packaging. Shelf life is extended through the use of a modified atmosphere pack with 75% CO₂ and 25% O₂.

The cost of production and processing

The chicken and beef were very similar in price to the customer, despite beef's higher costs of production (see Table 9). A whole 1.39kg chicken bought in Asda in late 2015 was £3.60, 25.8p/100g (or about 40p per 100g meat, when the weight of the carcass is removed). A pack of 500g lean mince was also purchased in Asda in late 2015 and cost 40p/100g.

Table 9: Cost of production of chicken and beef

	Whole chicken	Minced beef
Cost in Asda 2015	25p/100g (including meat and carcass) or 40p/100g (meat only)	40p/100g
Farmgate price	13p/100g	35p*/100g deadweight or 20p/100g liveweight**
Cost of production	11p/100g ²³	41p/100g
% breakdown of costs		
Purchase of animal		42
Feed and forage	Feed 80% wheat, 20% soy	20
Vet and medicine	81	1
Bedding		4
Other livestock expenses		3
Fixed costs (rent etc.)	19	31

*The farmgate cost of beef is an average for all the meat on the cow and therefore will include more expensive cuts, which will be charged at a much higher price in the supermarket. **Some beef sold for mince will be sold on a liveweight basis. This is particularly the case if slaughtering occurs off-farm, as is the case with ABP.

The table shows, in contrast to chicken, that beef is purchased from farmers at a price below the cost of production. This is possible due to the subsidies received through the Common Agricultural Policy (see Figure 10). These grants compensate beef farmers for the loss they make on beef production and provide them with a minimal income. Figure 10 demonstrates that subsidies through the CAP provide a much less significant portion of income for poultry farms, although average poultry farms still receive grants larger than those received by other farm types – namely horticulturalists – in absolute terms (DEFRA, 2015b). The price of livestock feed, if grown in the UK or Europe, is also subject to similar subsidies through CAP

payments to farms producing cereals. In addition, poultry farmers can apply for subsidies on poultry litter drying systems under the Countryside Productivity Scheme²⁴, as well as a range of incentives to shift to the use of renewable energy (Government, 2009).

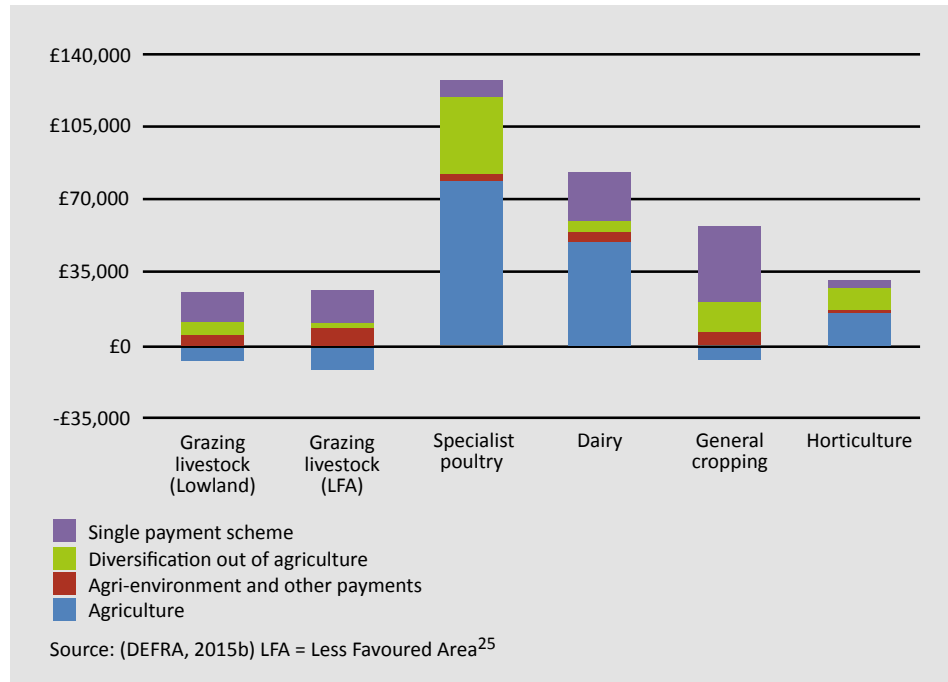
Breeding plays an important role in reducing prices, and government research budgets are an important source of investment into agricultural innovation. Selective breeding of health and welfare traits, improved understanding of the nutritional needs of the chickens, continual investment in housing and equipment and in the training of stockmen, and high feed conversion ratios all mean the number of days needed to fatten a chicken to the size required for sale has declined dramatically over the last 40 years (Compassion in World Farming, 2013), although this raises significant concerns in relation to animal welfare. Cattle are likewise bred for their specific qualities. Vast investments are made into improving the genetic quality of cattle in order to increase the profitability of beef. In 2014, ABP secured an agreement with Genus plc, a leading global animal genetics company, to improve beef genetics at the primary producer level for beef bulls to drive better feed-to-weight-gain efficiencies, carcass values and better-quality product for the consumer (London Stock Exchange, 2014).

Increasing imports of beef and poultry – from countries with lower production costs, but also lower animal welfare and environmental standards (Lowit, 2010) – contribute to pushing down the consumer price on both products.





Figure 10: Farm business income by farm type in England, 2014/2015



Efficiencies of scale

PD Hook and the 2 Sisters Food Group have formed the Hook2Sisters Limited joint venture and together reared and processed our family's chicken by integrating the entire supply chain from hatching through to packaging, so is able to drive efficiencies through economies of scale. The 2 Sisters Food Group process 6.1 million birds a week and is the largest processing company in the UK, holding a 35% to 40% of the UK broiler production market. It is one of five processing companies that control approximately 90% of the market (compared with 20 companies in 1993²⁶). This type of intensive farming is only possible through the use of antibiotics which play a part in generating antibiotic resistance²⁷. In contrast, the majority of beef farms in the UK are small – with an average beef herd size of between 28 and 50 cows²⁸ – and operating at a loss²⁹, although some large-scale intensive cattle-finishing enterprises are making profits (Horne, 2012).

The market for beef is increasingly dominated by smaller numbers of large food processing enterprises and supermarkets that drive down the price of red meat. Farmers have long complained that these large meat-processing companies are overly powerful, able to change their terms and conditions for cattle specification (McDougal, 2015) and impose price reductions at short notice (Copp, 2014).

Farmers are also concerned about the potential for contamination during meat processing, which then adversely affects the price of beef (as occurred during the horse meat scandal, when products from overseas were introduced into the system). Over the years, the farmers' share of the retail price has fallen, while the processors and supermarket share of the margin has increased (NFU, 2014) (Agriculture and Horticulture Development Board, 2015b).

Environmental costs

There are a series of environmental costs which are not captured in the price of meat. Poultry farms have by far the highest energy use on a per-hectare basis compared with all other forms of farming (livestock and arable) (DEFRA, 2013a). This reflects the intensive nature of the poultry sector, where livestock are often kept at high stocking densities in sheds requiring constant temperature regulation, lighting and ventilation³⁰. However, the energy use along the entire poultry supply chain is highest for the production of feed, which accounts for 80% of supply chain energy use (Pelletier, 2013). While soy makes up only about a quarter of the chicken feed, it is imported from China and South America (Soil Association, 2010). Global demand for soy is leading to rainforest and grassland destruction and, in turn, contributing to the significant greenhouse gas emissions. The demand for soy to feed the amount of poultry we consume is much greater than any other meat and campaigners argue that we should be breeding chickens without relying on soy.

The global carbon footprint of beef is estimated at just under 300kg CO₂e per kg protein (Wellesley, 2015). This is about eight times as more emissions-intensive on a per-kilo-of-product basis than chicken. Ruminant animals produce significant volumes of methane, their feed-conversion rates tend to be lower, and their generational and reproductive cycles are much longer, meaning that a greater share of energy and feed inputs is consumed in simply maintaining the animals rather than in producing outputs. While livestock produce emissions, grazing livestock also bring benefits to the environment to offset that negative impact, such as managing countryside, which acts as a valuable carbon sink and making best use of land unsuitable for producing any other food.

A yoghurt

Yoghurts are one of the “top 20” and Müller Corner yoghurts are the brand leader, accounting for 15% of the market share in 2013 (Anderson, 2015). There are nine different categories of ‘Corner’ yoghurt. We have looked specifically at Müller Crunch Corner, of which there are 12 types. These yoghurts are 135g each and contain between 171kcal and 209kcal each, and between 21g and 30g of sugar (added sugar as well as milk sugars).

We have looked in more detail at the Müller Crunch Corner: Strawberry Shortcake, which contains 209kcal and 24g sugar (just under the average for all Müller Crunch Corners). We attempted to trace the yoghurt back to its source but the manufacturer was not willing to provide the information. Based on the amount of calcium in the product, we estimate it is made using the equivalent of 140ml milk (although this is not all fresh milk, as milk whey powder and dried milk are also in the ingredients) and 17g added sugar, equivalent to 57% of an adult’s total daily amount and 90% of a young child’s (aged four to six years). Unlike a natural yoghurt, these yoghurts would classify as being ultra-processed according to the definitions used in Chapter 1, Table 3.

Cost of ingredients

First, we consider whether the product is cheaper per calorie than a healthier alternative – whole natural yoghurt. We compared prices in the four major retailers at two points in 2015. The Müller yoghurt is cheaper than the natural yoghurt calorie for calorie, although more expensive per 100g (see Appendix Table 8).

The milk in Müller crunch corner yogurt comes from dairies across the UK. Dairy farmers are supported through the Common Agricultural Policy (see Box 8). Figure 10 shows the contribution these subsidies make to dairy farmers’ income, thereby subsidising the cost of milk.

It costs on average 62p to produce a 4 litre bottle of milk – this cost fluctuates according to the cost of feed, herd replacement, fuel etc. The bottle is typically sold for 94p at the supermarket (BBC, 2015). In 2015, the farmgate price of milk has fallen, resulting in farmers making a loss on their sales of milk (AHDB, 2015). This has

been driven by two factors: the lifting of EU quotas and the Russian import ban. This has led to new payments from the EU to farmers to protect their income (AHDB, 2015). The lowering of the price of milk ultimately reduces the cost of raw materials for the Müller yoghurt as well as all other milk-based products.

The Müller yoghurt is made up of 14 ingredients, which can play a role in reducing costs. For example, in 2013, the farmgate cost of milk was on average 3.2p per 100ml (DEFRA, 2015c) (5.1p for the equivalent in natural yoghurt) and sugar 2.6p per 100g (Trading Economics, 2015). The cost of sugar is now declining due to the lifting of EU sugar quotas. By replacing yoghurt with sugar, the product can be produced more cheaply. Moreover, sugar plays a key role in defining the bulk (volume) and texture of food, as well as being able to bind water, which is important in food preservation. A food with a longer shelf-life reduces waste and helps reduce distribution costs, allowing products to enter new markets as they can be transported further.

Efficiencies of scale

Müller UK and Ireland has 19 sites nationwide and employs around 6,000 people in four main business units (Müller Wiseman, which produces fresh milk and butter; Müller Dairy, which produces yoghurts, including the Crunch Corner; TM UK, which produces chilled desserts, including for Cadbury/Mondelēz; and TM Telford, which produces private-label yoghurts). Müller Wiseman is the largest of three companies that dominate the UK dairy market. It took over Robert Wiseman dairies in 2012 and is set to take over Dairy Crest at the end of 2015 in an £80 million deal. After the merger, Müller Wiseman/Dairy Crest will process nearly half of all fresh milk consumed in the UK. The size of operations now possible for Müller will allow it to adopt economies of scale, which will introduce further efficiencies into its operations, keeping costs to a minimum. It will also give it strong negotiating powers with suppliers and buyers. The Competition and Markets Authority reviewed the takeover to check compliance with anti-competition laws (the 1998 Competition Act and the 2013 EC Merger Regulation) intended to prevent charging unfair prices, limiting production or refusing to supply an existing customer without an objective reason. The merger was allowed to go ahead, however,

when Müller agreed to process for Medina Dairy (a competitor) up to 100 million litres of milk each year for supply to national grocery retailers for a period of between five and eight years (Competitions and Markets Authority, 2015).

Advertising

To support high volumes of sales, Müller Corner is also heavily advertised and is the dairy sector’s biggest spender on advertising, with an expenditure of £10.7m per year (The Grocer, 2015b), the vast majority on TV advertising, including during X Factor³¹, which is watched by many children, but not covered by the advertising ban (see Chapter 3).

Potatoes

Potatoes make up 13% of a typical family’s vegetable spending. Potatoes are an important source of fibre, but consumption of potatoes has gone down considerably in the last few decades. This is in line with wider trends: while fruit consumption in the UK is increasing, vegetable consumption has declined considerably since the 1960s. While potatoes are not strictly counted as one of the five-a-day, looking into their supply chains sheds light on some of the factors that contribute to the price of vegetables.

The journey

We bought 2.5kg of Maris Piper potatoes from Tesco. They were grown on a large farm in Lincolnshire and then purchased by Branston Limited – a potato processor and supplier. Approximately 130 growers supply potatoes to Branston’s UK three processing sites with about 20% of these growers incorporated into Branston’s business.

After transporting unprocessed potatoes to their processing sites, Branston purchases packaging from retailers, with costs recovered on delivery of packaged products. All produce is processed and sold in single farm/single field batches in order to guarantee traceability. Branston sells the largest share of its produce to Tesco, although the company also has active partnerships with additional retailers (supermarket and wholesale).



The cost

The cost of the potatoes bought in Tesco was £2.00 | 8p per 100g. The projected average 2014 cost of production of a potato was £161/tonne | 1.6p/100g (Potato Council, 2013). Total costs for production, including rent and finance, increased by 65% between 2005 and 2014 (Agriculture and Horticulture Development Board, 2014a). The breakdown of 2014 costs was as follows: £52 on variable costs such as seed and fertiliser; £83 on fixed costs, including labour, machinery, property and administration; £24 on rent and finance (Potato Council, 2013). Average farmgate prices in 2014 were £157/tonne | 1.6p/100g (DEFRA, 2015d). Positive margins were small if not non-existent on crops, making capital investment for new technology unaffordable for many.

A number of factors may be contributing to the relatively high cost of vegetables in our families' shopping baskets:

Import tariffs apply to fruit and vegetables brought into the EU in order to make EU produce competitive within the EU market. Given that 33% of fruit and vegetables we eat come from outside the EU, these tariffs may mean that we pay a disproportionately higher amount for fruit and vegetables compared with other products (e.g. dairy products) that come from mostly within the EU (Food Research, 2015).

Shifting reliance on imports Supermarkets place very high importance on securing reliable supplies of fresh fruit and vegetables. This means it is difficult for typical families to benefit from price reductions resulting from unpredictable seasonal gluts. Supermarkets will typically secure buying relationships with two or more suppliers for each product they stock to guarantee deliveries. These suppliers work with producers in the UK and beyond to ensure a reliable supply. Approximately 20% of Branston growers, for example, are based outside the UK. It is possible for a farmer or supplier in Europe to be contracted to provide a product to cover a period when UK supply is typically low. If however, the UK crop is unseasonably late or early, this can mean consumers are paying a price premium for an imported product when UK produce is plentiful and cheap. This is less likely to be an issue for the potato, which stores well, and for which imported supplies

tend to be for niche varieties, but more of a problem for highly perishable vegetables. Production of potatoes (AHDB, 2015) along with other fruit and vegetables (DEFRA, 2014a) has been declining over the last 20 years in the UK, increasing the country's reliance on imported fruit and vegetables (DEFRA, 2015d; DEFRA, 2014a). While the majority (82%) of potatoes eaten in the UK are grown in the UK (DEFRA, 2015d), only 11% of fruit and 58% of other vegetables are eaten and grown the UK.

Rent and labour costs are likely to affect vegetable farmers more than others, as they are more likely to be tenant farmers and tend to employ more labour (Rural Business Research, 2015). While agricultural rents are subject to considerable regional variation (Agriculture and Horticulture Development Board, 2014a), farm agricultural and farm businesses tenancy rates³² have increased over the past decade (DEFRA, 2015e). Land speculation, tax incentives and fluctuating commodity markets for wheat and other crops are other key drivers of rent increases. The anaerobic digestion and biofuel sectors may also be contributing. Since 2010 small, often on-farm anaerobic digestion facilities have been eligible for significant fixed Feed-in Tariffs, guaranteeing energy producers a fixed income for producing electricity (Biogas Info, NDA). Rather than being a mechanism for harvesting the energy from vegetable waste (for example from re-grading), in practice, high costs and low yields for non-purpose-grown crops (Biogas Info, NDb) contribute to a situation where landlords and their agents have turned to the production of specialist biofuels, including soil-degrading varieties of cereals such as maize (Soil Association, 2015b). While Feed-in Tariffs for wind and solar electricity are set to be substantially cut from 2016, incentives for anaerobic digestion will continue to be offered, with guaranteed Tariffs several orders of magnitude higher than wholesale energy prices (WRAP, 2015c) (OFGEM, 2015). These incentives have helped produce a burgeoning industry of on-farm anaerobic digestion facilities³³, impacting on agricultural rents (Copp, 2015). With respect to labour costs, the forthcoming 'mandatory national living wage' could disproportionately affect fruit and vegetable producers.



Subsidies provided through the CAP also affect vegetable prices (see Box 8 and Figure 10). Croppers, including potato farmers, derive over half their income from subsidies. However, the considerably less-profitable horticultural sector derives far less from the Single Farm Payment, which pays out according to farm size, and effectively under-subsidises horticultural producers. English horticultural producers derive, in absolute terms, the least amount of direct finance from the CAP of all farm types, as shown in Figure 10. Horticulture (excluding flowers) makes up 0.9% of the total cultivated agricultural land in the UK (DEFRA, 2014b³⁴), but produces 4.7% of total output at market prices (DEFRA, 2015d). This under-subsidisation likely increases consumer prices for vegetables and fruit produced within the EU. There are specific allowances made within the CAP for member states to apply voluntary measures such as redistributive payments and favours, and exemptions for small farmers, but these measures are not applied in the UK. In addition, since 2008, the CAP has channelled additional support through the Fresh Fruit and Vegetables Aid Scheme, which provides finance to Producer Organisations to increase the bargaining power of these producers (European Parliament, 2011). Growers must generally market and sell over 90% of their crops through these POs (Rural Payments Agency, 2015). Producer organisations can receive grants of up to 4.1% of the value of all produce they market. However, the UK fruit and vegetable sector has historically, and continues to be, relatively disorganised. Around 38% of the UK fruit and vegetable sector was organised as of 2010 – less than the all-EU average and significantly below the organisation rate of most Western European member states (Directorate General for Internal Policies P.D. B, 2015). This limits the amount of financial support made available through this mechanism to British producers³⁵.

Waste. As with other vegetables, potatoes are perishable and incur considerable waste. In-field potato waste and loss is low compared with other fruit and vegetable supply chains, as seen in Appendix Table 9. This is partially as a result of there being steady demand for a crop that is not particularly affected by adverse weather conditions, meaning supermarket forecasting systems work better than with other produce (WRAP, 2011). More perishable products, notably lettuce, tomato and broccoli, are subject to higher waste in the field.

Grading and storage waste is a far greater issue for the potato crop. As of 2011, 3% to 13% of the potato crop was lost through grading, 3% to 5% during storage, and 20% to 25% through post-storage (re-grading and packaging). Grading includes quality controls on shape and appearance, as well as checks on taste, sugar content etc.

Consolidation of the supply chain. There has been a considerable consolidation of production of potatoes over the past two decades: the number of producers (with >3 hectares) declined from 14,900 to 2,150 between 1994 and 2014, with the average-sized area per producer increasing from 9.5 to 53.2 hectares over the same period (Agriculture and Horticulture Development Board, 2015c). Average farmgate shares of retail prices are, at the same time, decreasing. In 2000, growers received 27% of the retail price of potatoes, but only 17% in 2014 (DEFRA, 2015d). This suggests that fruit and vegetable producers are on the receiving end of a range of price pressures: experiencing increasing costs but, operating from a weak market position, unable to significantly increase farmgate prices or shares. The Groceries Code Adjudicator was established to protect producers operating in these circumstances, but its powers have been limited (see Box 9).

“In 2000, growers received 27% of the retail price of potatoes, but only 17% in 2014.”





BOX 8: THE COMMON AGRICULTURAL POLICY

CAP PILLAR I for direct payments to farmers and market control measures.

The Basic Payment Scheme

- The Basic Payment Scheme (BPS), formerly known as the Single Payment Scheme, established in the UK in January 2015, is currently the biggest of the EU's rural grants and payments. Farmers with at least 5 hectares of agricultural land and five 'entitlements' can apply. Under the BPS, farmers have to meet the 'greening' rules to receive a greening payment as part of their total BPS payment. The greening payment (three greening rules have to be followed on: crop diversification; ecological focus areas; permanent grassland) will be worth about 30% of a farmer's total payment (Rural Payments Agency, 2015b).
- More than £11.5 billion will be provided for the BPS for a seven-year period from 2015 (Rural Payments Agency, 2014).

CAP PILLAR II to promote rural development.

Rural Development Programme for England (DEFRA, 2015f)

- The RDPE is a funding programme under the CAP for projects to improve agriculture, the environment and rural life. With a budget of £3.5 billion, the current programme runs from 2015 to 2020. This includes around £2.1 billion on existing environmental schemes and around £900 million on Countryside Stewardship, which will help rural businesses improve the countryside environment.
- The main objective of the RDPE is better management of natural resources and the wider adoption of climate-friendly farming practices.
- The RDPE has six priority areas:
 - (1) knowledge transfer and innovation
 - (2) competitiveness of agri-sector and sustainable forestry
 - (3) food chain organisation, including processing and marketing of agricultural products, animal welfare and risk management in agriculture
 - (4) restoring, preserving and enhancing ecosystems related to agriculture and forestry
 - (5) resource efficiency and climate
 - (6) social inclusion and local development in rural areas.

BOX 9: THE GROCERY CODE AND ADJUDICATOR

The Competition Commission's 2008 review of the UK grocery market found that retailers were responsible for transferring excessive risks and costs to their suppliers, negatively impacting on investment and innovation on the part of suppliers (Competition Commission, 2008). This led to the establishment of the Groceries Supply Code of Practice (the Grocery Code) in 2010, and Grocery Code Adjudicator in 2013, tasked to regulate relationships between large grocery retailers and direct suppliers (Grocery Code Adjudicator, 2015).

The Adjudicator can take evidence from suppliers and launch proactive investigations for breaches of the Grocery Code. The Code requires grocers to limit negative supply chain behaviour such as varying any supply agreement retrospectively, changing supply chain procedures significantly without responsible notification during Supply Agreements, delaying payments for goods, requiring suppliers to contribute to marketing costs, charging for shrinkage or wastage, failing to compensate for forecasting errors, and making undue charges for customer complaints.

The Adjudicator's latest report found that eight out of 10 suppliers reported they had experienced practices likely in violation of the Grocery Code within the past year. A third of respondents had experienced five or more Code issues. Furthermore, only 39% of direct suppliers reported that they would consider raising an issue with the Grocery Code Adjudicator: of those that wouldn't, 58% feared retribution from the supermarkets and 41% believed the Adjudicator would not be able to do anything (Grocery Code Adjudicator, 2015). This suggests that many of the harmful retail practices described above remain unchecked.

This view is shared by the EFRA committee, which in a review of the dairy industry felt that the GCA was operating 'without the teeth' needed to do the job. While a statutory instrument – the power to make 1% fines on profits – was subsequently created (although remains unused as of winter 2015), problems with the Code's scope remain. The Code only covers relationships between direct suppliers and retailers: by leaving relationships between mid-supply chain suppliers and producers unchecked, supermarkets can effectively outsource exploitative supplier relationships (EFRA Select Committee, 2015).

The government is committed to reviewing the scope of the GCA in 2016.

Key findings

- Meat is affordable to eat in large quantities for typical families. The prices paid for beef do not cover the cost of UK beef production and so beef farmers are very reliant on government subsidies to survive. Intensive chicken farming is highly efficient, but carries risks and costs: risks in terms of necessary levels of antibiotic use, which is contributing to resistance; and costs in terms of the contribution of soy, used in feed, to greenhouse gas emissions globally.
- Highly processed food can be produced more cheaply than unprocessed, fresh equivalents by substituting more expensive ingredients with cheaper ingredients and increasing shelf life by the use of specific ingredients such as sugar and salt. In turn, these factors help minimise waste in the supply chain and keep costs down. These foods can be sold at a lower cost per calorie than healthier alternatives, but they also allow manufacturers to add considerable value through their production.
- Vegetable consumption and production is declining in the UK: we are becoming more reliant on imported vegetables. The pressure to keep products on the shelf all year may be forcing retail suppliers to source more produce from Europe, which may mean consumers don't benefit from unpredictable seasonal price drops from UK-grown vegetables. Vegetable growers benefit less from subsidies and may be more vulnerable to increases in rent and labour costs. Waste resulting from perishability and grading standards also contribute to inefficiencies in the supply chain.
- Tracing the yoghurt, meat and potato in the UK all reveal how the production and supply chain is being rapidly consolidated and run by a diminishing number of large actors. While this may allow for greater efficiencies in some areas, it may also threaten competition and innovation, and means individual producers and small companies are increasingly operating from a weak market position.

Policy conclusions and recommendations

- Government policy acts in a number of ways that contribute to the relative cost of food in our shopping basket or restaurant menu. These policy measures include agricultural subsidies, trade tariffs affecting animal feed, ingredients for processed food and fruit and vegetables imported from outside Europe, incentives for switching to and generating renewable energy, competition regulations, the Groceries Code Adjudicator and research investments into agricultural innovation.
- These policy measures could be used in a more strategic manner to re-balance the cost of food in our family's shopping basket – for example, by switching resources from Pillar 1 to Pillar 2 of the CAP and using grants to incentivise meat production that is less reliant on grain (for beef) and soy (for poultry); applying CAP's redistributive payments and small farmers scheme; reviewing incentives on renewable energy to ensure they are not having unintended consequences on rent values and viability of vegetable production; and strengthening the powers of the Groceries Code Adjudicator to provide a more effective set of checks and balances to give smaller actors more protection from large corporations, and allow producers and consumers to capture more value. Because these policy frameworks are complex and interdependent, we recommend that the EFRA Select Committee initiates a review to identify how the policy levers can make vegetables more affordable, without further squeezing British producers. The review should include an assessment of what progress has been made towards implementing the recommendations made in the 2010 Report of the Fruit and Vegetable Taskforce: a multipartite group convened in 2009 to assess how public/private actions could increase consumer consumption of fruit and vegetables, secure a competitive supplier base, and increase efficiencies within supply chains (Fruit & Vegetables Task Force, 2010). Vegetable supply chains should also be a central theme of the 2016 review of the Groceries Code Adjudicator.

Conclusions and recommendations



Conclusions and Recommendations

The food system in the UK faces a significant number of unprecedented pressures. These include a rising world population that needs to be fed and huge growing demand from emerging economies for meat; increasing numbers of climate-related shocks and the urgent need to reduce greenhouse gases and minimise global warming; rapidly depleting soils in agricultural land and an over-reliance on nitrogen-based fertiliser with its large carbon footprint; antibiotic resistance affecting the animals that feed us, as well as ourselves; increasing pressure to produce food efficiently and cheaply, which drives economies of scale and control over large sections of the food system by just a few; and new and emerging threats to the resilience of our food system, such as political shocks that suddenly interrupt trade routes and affect prices, and food crime where cheaper substitute foods are illegally put into our food chain undetected. The list goes on.

This report compiles a picture of what this complex food system, and the policies that regulate and incentivise it, mean for the diets of typical families in Britain. In the drive to ensure food is produced safely and on a scale that meets demand, the dietary health of our nation is frequently a secondary concern. Yet, there is now overwhelming evidence that what we eat poses the greatest threat to our health and survival. Typically, policymakers revert to the maxim that consumers drive demand: if people want to eat healthily, they will vote with their purses and wallets, and the food system will respond. However, there is emerging recognition among policymakers that educating individuals on how to make healthy choices in the supermarket or takeaway restaurant will not move the needle enough to curb diet-related disease and bring down the burgeoning healthcare bill. While nutrition education and measures to encourage behaviour change are important, many argue that we need to look to the food environment and food system that contributes to it to find ways to tackle unhealthy diets. Evidence shows that this is likely to deliver much bigger shifts than focusing on individual behaviour.

In this report, we explore how easy it is for typical family to choose a healthy diet if they wish to. And we ask whether government policy could play a bigger role in regulating our food environment and

incentivising our food system to contribute to the delivery of healthy and sustainable diets. We have shown there are many factors that make it harder for typical families to eat healthily, and make a case for diet and health to be dominant concerns in the future planning of our food system, factoring them into all food policymaking. We need a resilient food system which also delivers diets that make us thrive.

To construct this picture of the typical family's experience, we have drawn on a range of data sources: secondary analysis of some of the major national datasets; industry data; data gathered ourselves (the labelling snapshot, key informant interviews); and the wider literature. We have tended to focus on areas where quantitative data is available, so inevitably this does not capture the complexities of people's lives and how they manage their diets within that.

However, it is important to note that we have captured a majority experience. In fact, for many people, the dietary picture will be much worse than that presented here. We have focused in large part on households that have median income levels and yet there is a wider body of evidence that shows that as income declines, so does dietary quality. Moreover, there is now growing evidence that in the UK the pressure on incomes for people living in poverty has become so extreme that they are running out of food and being forced to seek charitable assistance. These pressures will have untold consequences on health and wellbeing, but we can be certain it will be driving people to seek out ever-cheaper sources of calories.

There are some very striking findings presented here. While in some areas our diets have been improving over time and calorie dense. These foods are generally a cheaper source of calories than fresh foods and there are huge incentives for companies to make and sell these foods because of the value-add that they generate. The result is that typical family members eat too many calories, too much sugar, salt and saturated fat and red and processed meat, and too little fibre, fruit and vegetables. This has created a public health crisis.

We are facing this crisis now, but its future consequences are just as important. The children in our typical family have very poor diets; one in three of them are overweight and obese, with all the concomitant psychological and health consequences; and a growing number are even experiencing Type 2 diabetes in adolescence. These children are tomorrow's parents. If nothing else, we need a food system and food policy that goes much further in helping to ensure that they can eat more healthily.

Currently food system policies are all owned and delivered by different parts of government, including in Brussels. The policies are at best fragmented, and at worst a heterogeneous and misaligned collection of measures that are inconsistently applied and can act against one another in practice to the detriment of consumers. However, there are some islands of excellence – the work that has been done on school food shows that with purposeful government leadership a lot can be achieved. We need more of this. And this is not to say that it is all down to government policy – there are plenty of examples of great leadership by actors in the food industry and in communities – but without government leadership, these examples are not taken to scale.

“We need a food system and food policy that goes much further in helping to ensure that families can eat more healthily.”

At the end of each chapter, we make specific policy recommendations and identify data gaps that should form the focus for future research and monitoring. There are four major recommendations that, taken together, could deliver a food system in Britain that supports healthy people and a healthy planet:

Set out a clear vision for achieving healthy and sustainable diets for all, with targets that can be monitored.

This should be in support of the world's new 2030 Sustainable Development Goals and build on the Paris climate summit and forthcoming Childhood Obesity Strategy. It should set targets for increasing consumption of vegetables and fruit, and reducing consumption of HFSS foods by children and meat by adults.

The Rio Olympics' Nutrition for Growth summit would provide a global platform to make this commitment. The UK has been a world leader in supporting global efforts to tackle undernutrition in low-income countries because it acknowledges that good nutrition underpins economic development. These commitments need to be matched by addressing poor nutrition in the UK, thereby investing in our future workforce and tackling the crisis of NHS finance.

Use policy measures to achieve a healthy balance in food costs.

Policies that affect the relative price of healthy and unhealthy food should be reviewed. Efforts to reduce household waste and increase purchasing power of family budgets should be strengthened. Ensuring VAT incentivises healthy eating and introducing a 20% excise duty on sugar-sweetened beverages are both measures that should be implemented. Beyond these, adjusting policy to make vegetables more affordable should be a priority, including using subsidies, renewable energy incentives and waste reduction policy more strategically. This should be the focus of an EFRA Select Committee inquiry and a central component of the review of the Groceries Code Adjudicator in 2016.

Manage the food environment so it enables healthy choices, particularly for children.

The Department of Health, through its leadership on childhood obesity, and with support from Number 10, should deliver cross-government action to significantly improve the food environment to make it easier for parents and their children to choose healthy options.

Priorities are:

- a. Banning advertising of HFSS foods on TV before the 9pm watershed.
- b. Developing a new marketing code to prevent advertising, sponsorship and promotions of HFSS through all non-broadcast channels, in supermarkets and eating out establishments.
- c. Helping to increase the proportion of low cost, healthy eating out options by clarifying planning policy for unhealthy eating-out establishments near schools and enforcing the Government Buying standards to help drive up standards for all food service suppliers.
- d. Setting upper limits for high risk nutrients in processed foods.
- e. Driving for improvements in labelling regulations in Brussels.
- f. Incentivising school leadership on school food using Ofsted inspection.

Where the government is not able, for legal reasons, to put these policies into law, it should lead a transparent, target-driven process with leading manufacturers, retailers and food-service operators that builds on the lessons learned from past work done on salt reduction, and which is rigorously and independently monitored.

Local authorities and cities that are leading the way in improving food environments should be given opportunities to influence central policy making, using channels such as the Local Government Association/ Department of Health's Care and Health Improvement Programme.

Make it easier for consumers to know what they are eating so they are empowered to demand a healthy and sustainable food system.

Supply chains for processed foods have become complex and opaque making it hard for consumers to know what they are eating. For fresh food, much more could be done with livestock farmers, processors and retailers to better inform consumers about the meat they eat, how it is produced and its environmental footprint. This requires a clear role for the Food Standards Agency in setting standards around transparency and publicly available information about products on sale, development of digital tools to allow consumers to easily access this information and working with the media to communicate the information.

Address critical data gaps

The dietary situation of our youngest is not covered by existing survey instruments and yet the first 1000 days of life from conception to a child's second birthday are known to be the most important for securing optimal life-long health and development. National survey instruments are needed to regularly monitor the situation of pre-school children and babies.

The data on school meal uptake for secondary schools needs to be improved. School meals provide a significant opportunity to improve the diets of teenagers (who have some of the worst dietary indicators).

Food at work is another area where there are data gaps. Addressing this gap may provide a spur to employers to take more action to improve the food environment of their staff and incentivise healthy eating.

Good nutrition underpins strong economies. It is crucial to cognitive development, educational and skills attainment. It prevents absenteeism at work and improves productivity. It reduces health care costs. Sound economic planning requires balancing short-term productivity gains against long-term economic advantage achieved by having a healthy workforce, and addressing inefficiencies created by irrationalities in the policy environment.

This report offers a system-based analysis of some of the policy levers that can be used to make it easier for typical British families to make healthy choices and avoid the life-threatening and costly consequences of diet-related disease, while at the same time going further to protect us all from the disastrous effects of climate change.

“Supply chains for processed foods have become complex and opaque making it hard for consumers to know what they are eating.”



Appendix

Table 1: Greenhouse gas emissions and water footprint associated with average and healthy diets

	Current Diet	'Healthy diet'
GHG emissions (Green, et al., 2015) ³⁶	2096 Kg CO2e per capita-year 4990 miles driven by a passenger car ³⁷	1,739 Kg CO2e per capita-year 4140 miles driven by a passenger car = Reduction of 17%
Water footprint (Vanham, et al., 2013) ³⁸	4265 l/capita/day 53 Baths ³⁹	3291 l/capita/day 41 baths = Reduction of 23%

Table 2: Average household weekly spending on retail and eating out

Breakdown of weekly household spending on food & drink	£	%
Tesco	£26.44	17.6
Asda	£14.33	9.5
Sainsbury's	£14.90	9.9
Morrisons	£11.06	7.4
Co-Operative	£5.67	3.8
Iceland	£2.31	1.5
Waitrose	£4.52	3.0
Marks & Spencer	£3.56	2.4
Aldi	£2.88	1.9
Lidl	£2.50	1.7
Independents & Symbols	£1.25	0.8
Bargain Stores	£1.15	0.8
Other	£5.58	3.7
Total amount spent on food & drink to eat at home (Kantar Worldpanel)	£96.16	64.0
Other food drink eaten out (e.g. restaurants/hotels)*	£32.26	21.5
Alcohol	£8.96	6.0
Takeaway meals eaten at home	£8.30	5.5
School food	£3.02	2.0
Meals bought and eaten at work	£1.58	1.1
Total amount spent on eating & drinking out (inc. takeaway) (LCFS 2013)	£54.12	36.0
Grand Total	£150.28	100.0

Food to eat at home: Proportions from Kantar Worldpanel 2013, applied to LCFS expenditure data.

Eating out data: Living Costs and Food Survey (2013)

*Expenditure on food and drink eaten out is derived from the COICOP classification code 11.1 (Restaurants and hotels – catering services). This group includes restaurants, cafés and canteens.



Table 3: McDonald's UK menu compliance with World Health Organisation criteria

Main course items		Desserts, salads and sides		Drinks	
Big Tasty	NO	Apple Pie	NO	Black coffee	YES
Big Tasty with bacon	NO	Blueberry Muffin	NO	White coffee	YES
Big Mac	NO	Chocolate Muffin	NO	Hot chocolate (regular)	NO
Quarter pounder with cheese	NO	Sugar Doughnut	NO	Cappuccino (regular)	NO
Hamburger	NO	Nestle Smartie McFlurry	NO	Mocha	NO
Cheeseburger	NO	Cadbury's Dairy Milk McFlurry	NO	Latte	YES
Double Cheeseburger	NO	Cadbury's Crunchie McFlurry	NO	Tea	YES
Chicken legend (bacon) with cool mayo	NO	Strawberry Sundae	NO	Coca-Cola (medium)	NO
Chicken legend (bacon) with spicy tomato salsa	NO	Toffee Sundae	NO	Sprite zero	NO
Mayo chicken	NO	Munchies Mcflurry	NO	Diet Coke	NO
Filet-O-Fish	NO	Oatso Simple Porridge	YES	Fanta Orange	NO
Crispy Chicken and Bacon Sandwich	NO	Oatso Simple Apple and Cherry Porridge	YES	Fruitizz	NO
Sweet Chilli Crispy Chicken Sandwich	NO	Breakfast Wrap with Tomato Ketchup or Brown Sauce	NO	Organic milk (semi-skimmed)	NO
Spicy Veggie Sandwich	NO	Big Breakfast	NO	Buxton natural mineral water	YES
Bacon & Egg McMuffin and Double Bacon & Egg McMuffin	NO	Grilled Chicken Salad Wrap	YES	Tropicana Orange Juice	NO
Sausage & Egg McMuffin and Double Sausage & Egg McMuffin	NO	Crispy Chicken and Bacon Wrap	YES	Robinsons Fruit Shoot	NO
Bacon Roll with Tomato Ketchup or brown sauce	NO	Sweet Chilli Crispy Chicken Wrap	YES	Banana Milkshake (Medium)	NO
Pancakes & Syrup	NO	Spicy Veggie Wrap	YES	Chocolate Milkshake	NO
Pancakes & Sausage with Syrup	NO	Grilled Chicken Salad	YES	Strawberry Milkshake	NO
Sausage, Egg & Cheese Bagel	NO	Grilled Chicken and Bacon Salad	YES	Vanilla Milkshake	NO
Bacon, Egg & Cheese Bagel	NO	Crispy Chicken Salad	YES	Mango & Pineapple Iced Fruit Smoothie	NO
McChicken sandwich	YES	Crispy Chicken and Bacon Salad	YES	Strawberry & Banana Iced Fruit Smoothie	NO
Grilled Chicken Salad Sandwich	YES	Toasted Bagel with strawberry jam	NO		
Fries (small)	NO	Chicken McNuggets (6 pieces)	YES		
Fries (medium)	NO	Chicken selects (3 pieces)	YES		
Fries (large)	NO	Fish fingers	YES		
Hash Brown	NO	Side Salad	YES		
Potato wedges	NO	Carrot Sticks	YES		
		Fruit Bag	YES		

Table 4: Top 20 products making up 50% of total household spending on retail food and drink in 2013 and avoidable waste generated for each category in 2012

Rank	Market category	Average household spend per month (£)	Proportion of expenditure on food item wasted (%)	Equivalent Value (£) thrown away per month
1	Vegetables and salad	17.17	32	5.49
2	Fruit	14.43	20	2.89
3	Wine	13.92	6	0.84
4	Milk	10.28	9	0.93
5	Spirits	9.81	-	-
6	Cheese	8.58	9	0.77
7	Biscuits	8.32	3	0.25
8	Chilled Ready Meals*	8.11	35	2.84
9	Chocolate Confectionery	7.7	6	0.46
10	Fresh Poultry	6.88	31	2.13
11	Beer+Lager	6.87	7	0.48
12	Cooked Meats*	6.77	10	0.68
13	Bread	6.29	28	1.76
14	Fresh Beef	6.28	13	0.82
15	Morning Goods	5.79	3	0.17
16	Breakfast Cereals	5.18	14	0.73
17	Ambient Cakes+Pastries	4.68	26	1.22
18	Yoghurt	4.44	9	0.40
19	Fresh Bacon Rashers	3.03	12.6	0.38
20	Crisps	2.97	-	-

Source: (WRAP, 2014b)

*Waste estimates for chilled ready meals include waste generated from takeaway food. Waste estimates for cooked meats include waste generated from sliced ham and sliced poultry only so may be an underestimate of all cooked meats.



Table 5: McDonald's UK meal costs

	Cheapest possible meal	Cheapest meal which only includes "healthy" foods (according to WHO method)	Meal offering the greatest saving
Items	Cheese burger 99p Small soft drink 89p	Sweet Chilli Chicken Wrap £2.99 Mineral Water £1.29	Large Big Mac Meal Big Mac £3.09 Large fries £1.39 Large drink £1.39
Total cost	Total cost: £1.88	Total cost: £4.28	Total meal deal price: £5.09 Saving: 78 pence
Total Energy (Kcals) (with full sugar drink)	401	460	1,144 (from large Coca-Cola)
% Daily salt intake (adults = 6g)	27%	33%	50%
% Daily free sugar intake (with full sugar drink or diet drink)	Cheeseburger + Full sugar drink 117% Cheeseburger and diet drink 27%	27% (8g)	Big Mac, fries and large full sugar coke 203% Big Mac, fries and large diet coke 27%
% Daily saturated fat intake⁴⁰	30% females, 23% males (7g)	15% females, 10% males (3g)	60% females, 40% males (10g + 2g)
% Daily fibre intake⁴¹	7% (2g)	10% (3g)	33% (4g + 6g)
Fruit and vegetable portion	None	None	None
Red and processed meat (g)	33g	0g	66g

Source: October 2015 store prices and McDonald's UK website <http://www2.mcdonalds.co.uk/food/> accessed October 2015

Table 6: Food hygiene ratings England, Wales and Northern Ireland ⁴²

	0 (urgent improvement needed)	1 (major improvement needed)	2 (improvement needed)	3 (generally satisfactory)	4 (good)	5 (very good)
Takeaways/sandwich shops (n=)	556	3551	2853	9114	10529	18296
Takeaways/sandwich shops – %	1.2	7.9	6.4	20.3	23.5	40.7
Restaurants/cafes/canteens (n=)	466	3817	3443	11752	20305	55432
Restaurants/cafes/canteens – %	0.5	4.0	3.6	12.3	21.3	58.2

Source: Food Standards Agency

Table 7: Food hygiene ratings Scotland

	Pass	Improvement required
Takeaways/sandwich shops (n=)	3343	991
Takeaways/sandwich shops – %	77.1	22.9
Restaurants/cafes/canteens (n=)	7981	1182
Restaurants/cafes/canteens – %	87.1	12.9 ⁴³

Source: Food Standards Agency

Table 8: Yoghurt cost comparisons 2015

	Cost per 100g (£)	Cost per 100kcal (£)
Müller crunch corner	0.33	0.22
Whole natural yoghurt	0.20	0.25

Source: Mysupermarket.com; McCance & Widdowson



Table 9: Percentage loss and waste for four different fruits and vegetables through the supply chain (WRAP, 2011)

Product	Field loss (Central range)	Grading loss	Storage loss	Packing loss	Retail waste
Lettuce	5-10%	No data	0.5-2%	1%	2%
Tomato	5%	7%	No data	3-5%	2.5-3%
Potato	1-2%	3-13%	3-5%	20-25%	1.5-3%
Broccoli	10%	3%	0%	0%	1.5-3%

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Notes

¹ Based on a family of four with two adults, one child over 14 and one child aged under 14 years.

² Free sugars includes all monosaccharides and disaccharides added to foods by the manufacturer, cook or consumer, plus sugars naturally present in honey, syrups and unsweetened fruit juices. The NDNS does not contain a derived variable for free sugars, only non-milk extrinsic sugars (NMES). NMES includes stewed, canned and dried fruit whereas the free sugars classification does not. Therefore, NMES are used but may result in a slight overestimate of free sugar intake.

³ Red and processed meat includes beef, lamb, pork, sausages, burgers and kebabs, and offal, white processed meat and other red meat.

⁴ Latest recommendations for fibre are for AOAC fibre. The NDNS only contains estimates for Non-Starch Polysaccharides (Englyst method) so these values were adjusted by 1.33 as per https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/404094/ERG_eatwell_modelling_update_paper_final.pdf

⁵ The doubly labelled water technique is a method of accurately assessing energy expenditure. It can be used to assess the level of misreporting of energy intake in habitual reported dietary data.

⁶ See Chapter 3 for details on how advertising restrictions are made.

⁷ The model provides a single score for a particular product based on points for any 'negative' nutrients it contains which can be offset by points for 'positive' nutrients (Department of Health, 2011a). The scores for these nutrients were based on UK guideline daily amounts and dietary reference values (Rayner, et al., 2004).

⁸ Specifically: low fruit consumption, low vegetable consumption, low whole grain consumption, low seed and nut consumption, low milk consumption, high processed meat consumption, high red meat consumption, high sugar sweetened beverages consumption, low fibre consumption, sub-optimal calcium intake, low seafood omega 3 fatty acid consumption, low polyunsaturated fatty acid consumption, high trans fats intake and high sodium intake.

⁹ Obvious decay experience - the traditional measure used in dental epidemiology surveys seeking to establish the number of "cavities" to be "filled".

¹⁰ Prevalence of decay experience in permanent teeth

¹¹ Prevalence of decay experience in primary teeth

¹² Note: The survey had a response rate of 19% and this differed between school phase (22% for primary, 27% for special schools, 14% for secondary). Due to the low response rate in secondary schools, findings for

secondary schools were not included. <https://www.gov.uk/government/statistics/schools-pupils-and-their-characteristics-january-2015b>

¹³ For this analysis we use the World Health Organisation's nutrient profiling model because the data available from McDonald's was not as detailed as that needed for applying the UK's model used in Chapter 1.

¹⁴ For a detailed examination of the differences between the two schemes, cf. <http://www.sacert.org/LinkClick.aspx?fileticket=DiQ4o9EbyqI%3d&tabid=1764>.

¹⁵ Avoidable waste – a classification used in the report relating to food and drink thrown away that was, at some point prior to disposal, edible, e.g. milk, lettuce, fruit juice, meat (e.g. Unavoidable waste would include meat bones, egg shells etc.)

¹⁶ WRAP Waste Summary Table 2014.

¹⁷ Kantar Worldpanel provided us with a detailed breakdown on household spending on retail food and drink in Great Britain in 2013 and 2015. This data was not restricted to middle-income households.

¹⁸ <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-50966>; <http://www.ons.gov.uk/ons/rel/bus-register/uk-business/2015/index.html>. Re. eating out sites: 2005 tally of SIC03 55.3 local units (Restaurants, including take-away shops and mobile stands); 2015 tally of SIC07 56.1 local units (Restaurants and mobile food service activities). Re. stores predominately or exclusively selling food and beverages: 2005 tally of SIC03 52.11 & 52.21 & 52.22 & 52.23 & 52.24 & 52.25 & 52.27 local units; 2015 tally of SIC07 47.11 & 47.21 & 47.22 & 47.23 & 47.24 & 47.25 & 47.29 local units. Population estimate: <http://www.ons.gov.uk/ons/rel/pop-estimate/population-estimates-for-uk-england-and-wales--scotland-and-northern-ireland/mid-2014/index.html>

¹⁹ <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-50966>; <http://www.ons.gov.uk/ons/rel/bus-register/uk-business/2015/index.html>. 2005 tally of SIC03 55.3 local units (Restaurants, including take-away shops and mobile stands); 2015 tally of SIC07 56.1 local units (Restaurants and mobile food service activities). Population estimate: <http://www.ons.gov.uk/ons/rel/pop-estimate/population-estimates-for-uk-england-and-wales--scotland-and-northern-ireland/mid-2014/index.html>

²⁰ www.sruc.ac.uk/download/downloads/id/1884/aviagen

²¹ 2 Sisters Food Group has been reviewing its anti-biotic usage over the past two years, and no longer uses three of the antibiotic classed by the WHO as being critically important to human medicine. Cf. <http://www.2sfg.com/news/company-news/antibiotics/#sthash.svjr0AgY.dpuf>

²² In 2014 the average age of slaughter of cattle slaughtered for prime beef was 24.8 months for females and 23.2 months for male cattle. (AHDB personal communication).

²³ http://www.fbspartnership.co.uk/documents/2013_14/Poultry_Report_2013-14.pdf Cf. Table 2.8. NB. This figure represents an average cost per bird for 15 non-contract broiler farms, own their own birds and incur all the costs associated production.

²⁴ www.gov.uk/rural-development-programme-for-england

²⁵ Areas where agricultural production or activity is more difficult because of natural handicaps, e.g. difficult climatic conditions, steep slopes in mountain areas, or low soil productivity in other less favoured areas.

²⁶ <http://www.britishpoultry.org.uk/poultry-the-best-value-food-for-consumers-during-last-two-decades/>

²⁷ Walliga D, Rayner, G and Lang, T, 2015, Antimicrobial resistance and biological governance: explanations for policy failure. Health Policy Vol 129, Issue 10, p 1314-1325

²⁸ The UK beef industry is able to utilise steep grassland and other terrain not suitable for other use. This, combined with a traditional concentration of family-run farms explains the relatively small size of beef farms in the UK. <http://www.nfuonline.com/great-british-beef-week-sucklers-2/>.

²⁹ Losses are due to a number of reasons: slow decline because of rising imports, lower prices for beef, rising input prices and assorted food crises (BSE in the mid-90s, Food and Mouth 2001 and 2007, horsemeat scandal 2013) http://beefandlamb.ahdb.org.uk/wp/wp-content/uploads/2013/05/p_cp_inthebalance.pdf.

³⁰ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/230090/fbs-energyuse-statsnotice-16aug13.pdf

³¹ For example, the new “Wonderful Stuff” campaign in 2011 was launched during the prime time weekend breaks of The X Factor. <http://www.thedrum.com/news/2011/10/07/sneak-peek-muller-wonderful-stuff-advert-tbwa>

³² Cf. <https://www.gov.uk/guidance/agricultural-tenancies> for an explanation of the differences between these.

³³ See <https://www.google.com/maps/d/u/0/viewer?mid=z0CaRSV1fHfk.k6kv8-jH1gMc> for a non-comprehensive map of agricultural energy to waste sites produced by Biogas Info/NNFCC.

³⁴ Potato crops make up 0.8% of cultivatable land, but individual farms are on average significantly larger than horticultural holding (cf. <http://www.farmbusinesssurvey.co.uk/DataBuilder/>)

³⁵ Furthermore, while reforms have ostensibly meant the CAP no longer supports the forced withdrawal of ‘overproduced’ fruit and vegetables from the market, the reformed CAP offers Producer Organisation addition grants – capped at 0.5% of marketed production – for ‘crisis prevention and management measures’: meaning finance is still made available, in principle, to producers to limit their produce reaching market: potentially increasing consumer prices across the continent in the process. In practice, between 2008 and 2012 the CAP funded only €8.3 m of product withdrawals. Cf. <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52014DC0112>

³⁶ Current UK diet (based on years 1-3 of the NDNS Rolling Programme) versus WHO recommended diet

³⁷ <http://www2.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

³⁸ Data on food consumption for the EU28 member states (based on FAO food balance sheets) versus a diet recommended by the German nutrition society.

³⁹ <http://www.waterwise.org.uk/news.php/11/showers-vs.-baths-facts-figures-and-misconceptions> one bath can hold 80 litres of water so 4265l/capita/day = 53 baths

⁴⁰ Based on the recommendation for men to consume no more than 30g saturated fat per day and women to consume a maximum of 20g saturated fat per day.

⁴¹ Based on recommendation of 30g per day

⁴² Note the total number of eating out places are higher in this data-set than those presented in the section on Convenience because this draws on Local authority data (rather than the ONS data-set) and includes canteens (including those in schools, workplaces and department stores).

⁴³ <http://ratings.food.gov.uk> - exempt premises, and premises awaiting inspection and publication, excluded.



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