OCTOBER 2020

From 2025 we are FOODRISE

This document uses our old branding

› When there's no waste, there's a way (to net zero)

A call for policy for food waste prevention

KEY TAKEAWAYS

- Food is a climate issue: food waste is both a hidden barrier and an untapped opportunity to help reach net zero UK emissions. Addressing food waste is a 'no regrets' policy option.
- Halving UK food waste and reforesting liberated domestic grassland could deliver roughly 4% of the emissions cuts the UK needs to reach net zero[a] – plus contribute significantly to reducing the overseas emissions and land use from UK imports.
- While there have been some reductions in food waste through voluntary initiatives, the UK is not currently on track to halve food waste in line with an ambitious interpretation of SDG 12.3, and progress must accelerate: regulatory intervention will be necessary to realise the potential of food waste as a climate solution including binding targets and incorporating food waste reduction into climate change action frameworks, as well as into land use, agriculture and other policies.
- There is and has always been public support for government regulatory action on food waste. Addressing food waste from farm to fork, including in households, as part of an ambitious food and agriculture-focused climate policy is an opportunity for the UK to lead an international agenda to mitigate the environmental impacts of our food system.

›FEED BACK

“It’s time to get serious about food waste in fight against global heating.”

Dave Lewis – Former Tesco CEO[1]

SUMMARY OF RECOMMENDATIONS

1. **Integrate ambitious food waste reduction targets, in line with the goal to halve food waste throughout the supply chain by 2030 against a 2015 baseline, into climate strategies and legislation:**
   - Adopt an ambitious food waste goal in the UK’s 2020 Nationally Determined Contributions (NDC), including a national binding target to reduce food waste (both edible and inedible) by 50% from farm to fork by 2030, against 2015 baselines.
   - Model and implement an ambitious policy pathway to achieve a 50% reduction in food waste by 2030.

2. **Harness and enforce existing waste legislation and implement the ambitions set out in the Waste and Resources Strategy:**
   - Develop an effective, UK-wide food waste data baseline, including funding top-down approaches to collecting data in hard to measure sectors such as hospitality and on farms.
   - Bring forward the government’s plans to make food waste reporting and reduction targets mandatory for all large businesses, in line with an ambitious UK target to reduce food waste from farm to fork by 50% by 2030, against a 2015 baseline.
   - Put in place the regulatory, fiscal and enforcement regime to operationalise the food use hierarchy, as per the ‘polluter pays’ principle.
   - Extend the government’s ambition to eliminate food waste in landfill or to incineration by 2030, to support a genuinely circular economy, and in the short term, increase taxes on landfill and incineration.

3. **Capitalise on the opportunities of new food and farming policy to support food waste prevention on farms:**
   - Instrumentalise the provisions of the Agriculture Bill and Environmental Land Management Scheme (ELMS) to both incentivise and enable the measurement of on-farm food waste and to incentivise the reduction of food surplus occurring in primary production.

4. **Harness market frameworks and business practices for food waste prevention:**
   - Ensure UK and overseas farmers, including indirect suppliers, can have recourse to the Groceries Code Adjudicator for waste incurred on their farms as a result of unfair trading practices.
   - Undertake a post-Covid review of the groceries supply chain to identify points of intervention to increase the diversity and resilience of supply chains and reduce waste.

5. **Put in place the conditions for transformative change in the groceries market:**
   - Enable greater citizen agency over their food.
   - Support the shortening of supply chains and more regional food production and distribution and the regional use of surplus crops to allow better food access.
   - Support the diversification of the food sector, boosting the scale and reach of alternative business forms to displace the dominance of the supermarket.

a This is an estimate. It is based on a rigorous assessment of the total emissions mitigation possible through halving UK food waste, which found that halving the UK’s food waste and planting trees on the spared land (both domestically and overseas) would save emissions equivalent to 11% of the UK’s total emissions[2,3]. Feedback then used a recent study suggesting that 62% of UK food emissions occur overseas[4], to estimate the proportion of these emissions savings which would occur domestically. As accurate figures were not available for the proportion of grassland overseas used to produce food consumed in the UK, we have assumed the same proportion as for direction emissions, 62%.

1. INTRODUCTION: FOOD WASTE IS A CLIMATE ISSUE

Food waste is a climate issue, representing 8-10% of global greenhouse gas emissions[5]. But despite being a key driver of land use change, deforestation and biodiversity loss, food is rarely mentioned in national climate commitments – including countries' Nationally Determined Contributions (NDCs) to the Paris Agreement. Food waste is not mentioned in a single NDC, and only 11 countries make reference to food loss, while 24% of NDCs mention climate-smart agriculture and 16% mention land use planning[6].

The UK has a long-standing reputation as an international leader on food waste action: now it is time to realise the potential of ambitious food waste prevention to deliver climate goals. In 2019, the UK became the first major economy to pass net zero legislation; now the task at hand is one of operationalisation. Addressing food waste is a 'no regrets' policy option.

This policy brief sets out the overwhelming case for scaled up, regulation-led action on food waste, as part of an ambitious plan to decarbonise the UK's food system. The brief explores, first, why solving the climate crisis requires action on food waste; second, why action to date is failing to truly realise the emissions saving potential of food waste prevention; and third, what an effective food waste prevention policy would look like.

SOLVING THE CLIMATE CRISIS REQUIRES ACTION ON FOOD WASTE

Food waste represents an ecological catastrophe of staggering proportion: food production is the single greatest environmental impact humans have on the planet, and the UN estimates that one third of all food produced goes to waste[7]. It is also a growing problem: between 1961 and 2011, global food loss and waste tripled, with emissions from food production estimated to have more than tripled[8].

Food waste generates 3.3 billion tonnes of Greenhouse Gases (GHG) per year[9] and uses up to 1.4 billion hectares of land, equivalent to 28% of the world's agricultural area[9]. The IPCC Special Report on Climate Change and Land highlights that, during 2010-2016, global food loss and waste equalled 8–10% of global GHG emissions and cost about USD 1 trillion per year[10].

FIGURE 1: FOOD WASTE IS A CLIMATE PROBLEM

Emissions occur both in the production of wasted food and in its disposal:

- Emissions and pollution associated with growing and producing food that is wasted, including emissions from farming, fertiliser application, manufacturing and storage such as refrigeration, transportation and retail.
- Emissions and pollution directly associated with disposal of wasted food, such as methane emissions from landfill and carbon emissions from incineration.

Solving food waste is more than a significant opportunity to mitigate climate change: it is an essential accelerator towards meeting emissions reduction targets at the scale and pace required to prevent the worst dangers of global heating. Even as the world continues on a path towards warming of 3 or even 4 degrees, anticipated to have catastrophic impacts on human life and security[11], numerous academic studies have found that preventing food waste is a critical element in achieving a sustainable food future and living within planetary boundaries[12,13]. In one scenario, modelled by Project Drawdown's 2020 review, reducing food waste has the potential to reduce global CO_2-eq by 87.4 Gigatonnes – more than any other climate solution modelled, including widely discussed policy measures such as electrification of transport[14].

Preventing food waste will not just help reduce direct emissions. There is an opportunity cost in deploying land to grow wasted food; by reducing food waste, the agricultural burden on land reduces. Food waste prevention enables the realisation of land based GHG sequestration goals, such as through afforestation, and avoids the emissions, ecological and social damage of turning biodiverse carbon sinks, most notably forests, into farmland. The UN Food and Agriculture Organisation (FAO) estimates that uneaten food occupies 1.4 billion hectares of land globally, equal to 30% of the world's agricultural land[9]. More recently, the IPCC has estimated that reducing post-harvest losses could free as much as 2 Mkm^2 and reducing food waste could free up 1.4 Mkm^2 of land globally – and this does not include food wasted at the harvest stage on farms[10]. Given the urgency of appropriately implemented nature-based solutions to climate change, such as afforestation, land availability and use are vital issues[10].

PREVENTING FOOD WASTE IS CRITICAL IN ACHIEVING THE UK'S EMISSIONS GOALS

In the UK, vast amounts of food are wasted from farm to fork. An estimated 9.5 million tonnes of food per year is wasted post-farmgate in UK manufacturing, hospitality and food service (HaFS), retail and households. Food waste is not properly measured at primary production level – on farms – but recent estimates have put it at between 3.5 and 5 million tonnes[15]. **These estimates suggest that between a quarter and over a third of the UK's total food waste may occur on domestic farms.**

As much of the food we eat is not grown in the UK, the global impacts of UK food supply chains – and waste – are enormous. Only approximately two thirds of emissions associated with household food waste occur within the UK[16]. Instead, our globalised supply chain and limited home-grown production means that the UK offshores much of its food waste emissions. There are no estimates for the overseas land sparing potential of addressing food waste, but given that 45% of food consumed in the UK in 2019 was imported[17], and that the highest value imported commodity groups were fruit, vegetables and meat, the overseas land footprint of UK food wasted is likely to be considerable.

A recent Life Cycle Assessment (LCA) of food waste emissions and land use found that halving the UK's food waste from farm to fork by 2030[b] could result in direct emissions savings of 13.6$MtCO_2$eq per year[2] – of these, Feedback estimate that about 4.9$MtCO_2$eq per year would occur domestically and 8.7$MtCO_2$eq per year would occur overseas[c].

The indirect emissions saving potential is greater still. The LCA found that halving UK food waste could spare 3 million hectares of grassland – approximately one third domestically and the remaining two thirds overseas – by 2030, as well as saving around 800,000 hectares of cropland, approximately 240,000 hectares of which would be saved domestically[3d]. Emissions mitigation from afforestation on spared grassland would save an additional 24 $MtCO_2$, compared to 13.5 $MtCO_2$ domestically. In other words, the potential of preventing food waste to address our exported emissions burden and land footprint is considerable, opening the possibility of reducing the burden the UK's demand for food places on many regions around the world, including particularly ecologically vulnerable and biodiversity-rich zones.

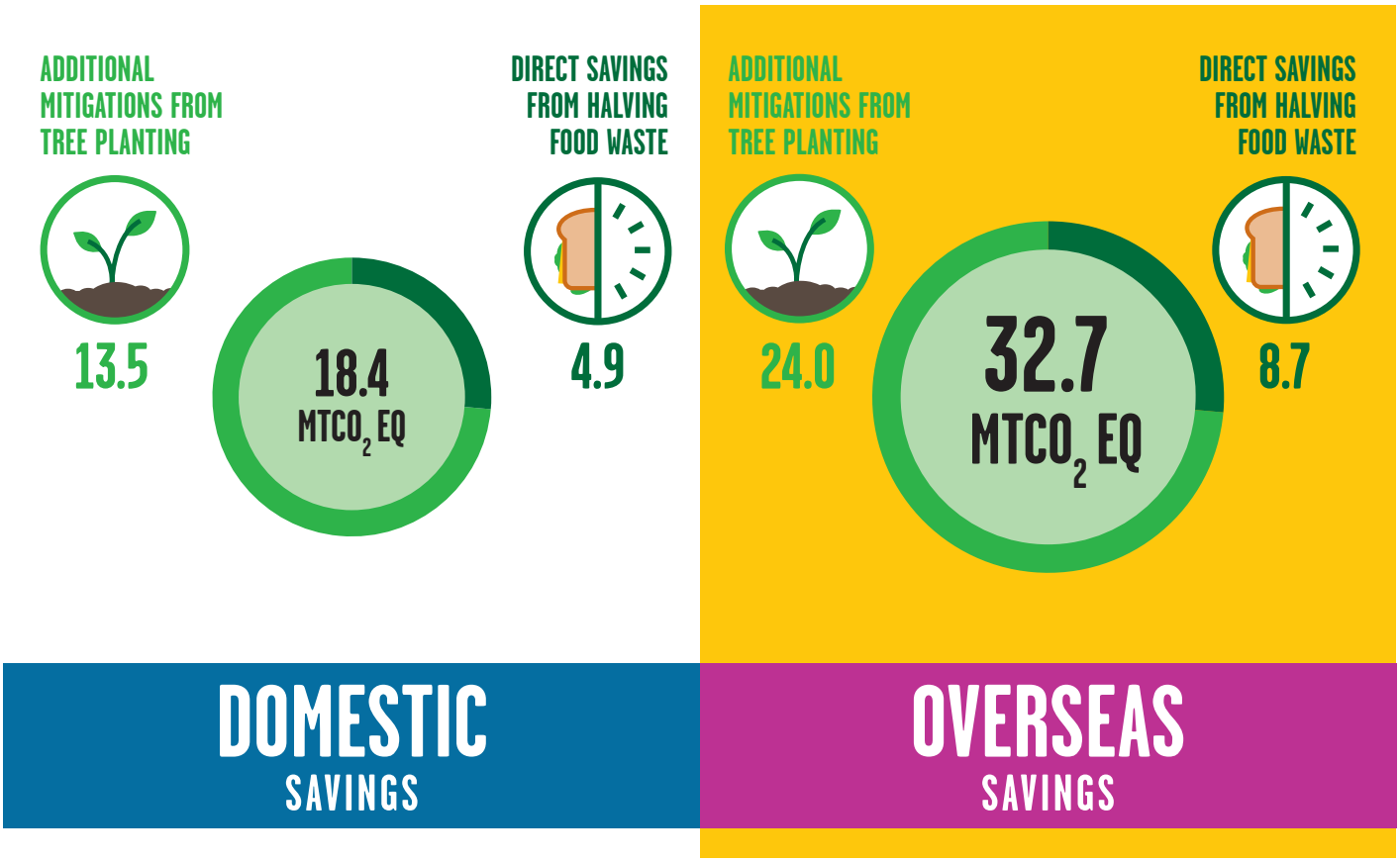
Overall, the LCA found that halving food waste at all levels of the food system – from production to consumption – and using the grassland (both domestic and overseas) spared from production to plant trees, would mitigate up to approximate 11% of UK's total emissions[3].

b More specifically, this is a 50% reduction in all food waste (edible and inedible) from farm to fork by 2030, against a 2015 baseline. In practice, this requires more than a 50% reduction in edible food waste.

c Since reliable data could not be found on the percentage of UK grassland use that occurs overseas vs. domestically, Feedback used the same ratio of 62% occurring overseas and 38% occurring domestically that is true of UK food emissions[4].

d Cropland is land used to grow arable and horticulture crops; grassland is land used for pasture (to produce beef, lamb and dairy) but not suitable for growing crops.

FIGURE 2: ESTIMATED DOMESTIC AND OVERSEAS EMISSIONS SAVINGS AS A RESULT OF HALVING UK FOOD WASTE



BOX 1: THE MITIGATION MULTIPLIER – HALVING MEAT AND DAIRY WASTE

Meat and dairy represent a major portion of the climate and biodiversity impacts of our diets. Producing meat and dairy products is emissions intensive, due mainly to the larger land use implications inherent in their production due to the cultivation of animal crops and pasture and to methane emissions from livestock[18]. The Committee on Climate Change (the CCC) reports that, of all their recommendations on land use, a modest 20% reduction in the most carbon intensive foods (beef, lamb and dairy) has the largest impact on releasing land, as well as resulting in direct on-farm emissions savings of 6MtCO$_2$e[19]. In terms of overseas land footprint, UK imports of beef, leather and soya alone accounted for 5.5 million hectares of land, largely located in countries at high risk of biodiversity loss[20]. It is therefore vital that overconsumption of meat and dairy in the UK is urgently addressed, alongside the prevention of waste of meat and dairy products. WRAP estimates that around 400,000 tonnes of meat is wasted every year in the UK[21]. Research looking at the emissions and land use impacts of preventing different types of food waste found that preventing one tonne of beef waste would save over forty times as many GHG emissions as saving the same weight of bakery waste[3]. It is notable that most meat and milk is wasted in homes: it is important to question the pricing and framing of these high-value and high-impact products in shoppers' experience. There is a marked correlation between the downward pressure on meat and dairy prices over the past several decades and an increase in wastage of these valuable products: for example, chicken, the cheapest meat product, is also the most wasted[22].

2. INITIATIVES TO DATE HAVE FAILED TO DELIVER SIGNIFICANT REDUCTIONS OF FOOD WASTE AND EMISSIONS

The UK is often positioned as a food waste leader[23], and indeed, in comparison to some similarly higher-income countries, there have been significant private sector and civil society efforts to address aspects of the UK's food waste problem. The UK's resources and waste charity, WRAP, has developed an extensive portfolio of work on household food waste behaviour change, most notably through the 'Love Food, Hate Waste' campaign, often hailed as a model of best practice[24], as well as a long-term programme of work with businesses, explored below. Yet despite these efforts, the government's 2018 Resources and Waste Strategy stated that: 'Our determination to cut food waste has not been matched by progress, which in recent years has plateaued'[25]. Earlier this year, the CCC starkly set out how policies on agriculture and land use are not driving the required rapid changes towards net zero[19]. This section reviews the UK's action on food waste and explores the successes and limitations of these approaches.

FOOD WASTE ACTION IN THE UK

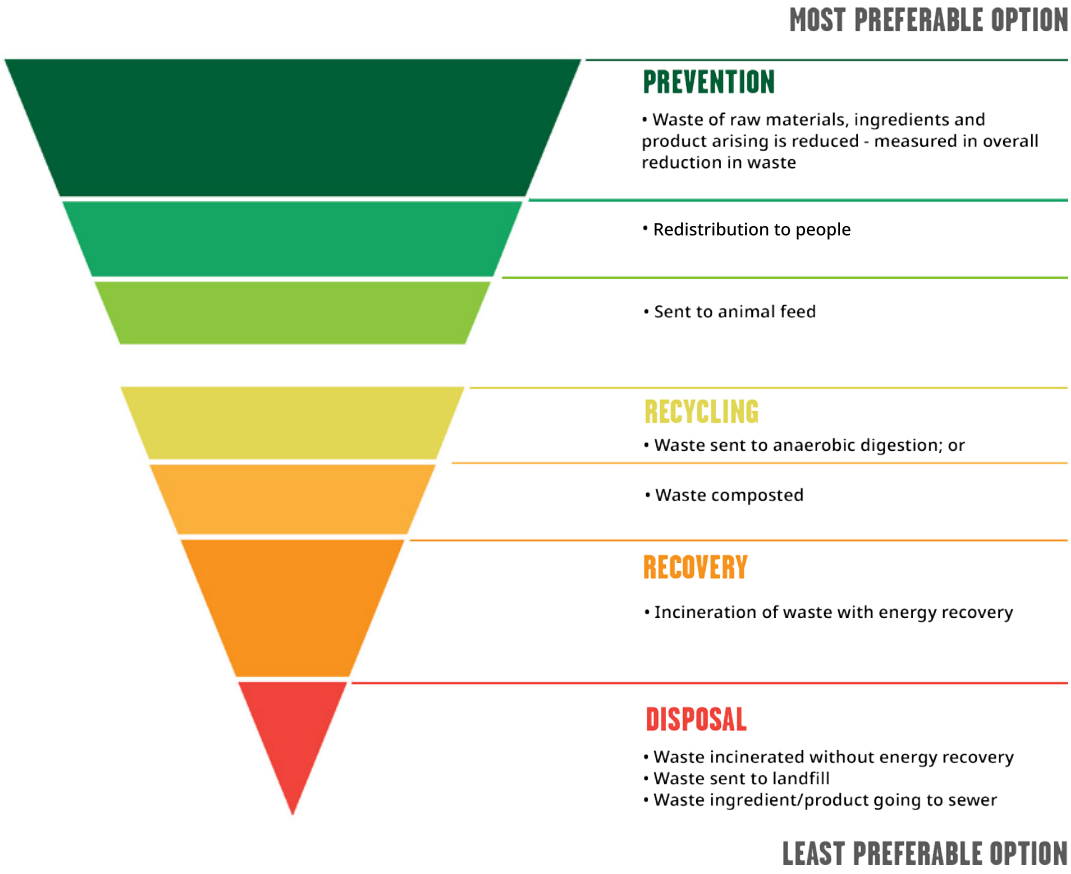
Internationally, action on food waste has largely been set through the framework of the Sustainable Development Goals (SDGs), agreed in 2015, which include Target 12.3 to halve per capita global food waste by 2030[26]. Specifically, the target aims to halve food waste at retailer and consumer levels and 'reduce food losses along production and supply chains', a framing which has proven problematic for defining ambitious action to address the significant proportion of food that is wasted at pre-retail levels.

In the UK, the Courtauld Commitment has been the main vehicle for voluntary business action on food waste, supported by the UK government through its funding of charity WRAP. Launched in 2005, the Courtauld Commitment has become a series of voluntary agreements between private sector companies, aimed at improving resource efficiency and reducing waste within the UK grocery sector. The current iteration, Courtauld 2025, has also in recent years been complemented by a parallel voluntary agreement called the Food Waste Reduction Roadmap[27], also administered by WRAP.

The UK government adopted the SDG 12.3 in 2015, alongside the other SDGs. Waste and resource management are devolved issues, and Scotland and Wales have each adopted additional voluntary targets to reduce food waste. Scotland, the first UK nation to adopt a food waste target, is aiming to reduce food waste by one third by 2025, and Wales has the ambitious target to halve food waste by 2025[28]. England's regulatory approach to waste is overseen by the Department of Environment, Food and Rural Affairs (Defra), who offer statutory guidance on applying the government's food and drink surplus and waste hierarchy, based on the food use hierarchy, which states that food surplus should first be prevented, and any surplus made available for human consumption, then animal consumption, before disposal through composting or Anaerobic Digestion (AD), with incineration and landfill the last resort disposal routes.

Defra's latest Resources and Waste Strategy, published in late 2018, sets out plans for the government to appoint a 'Food Surplus and Waste Champion'[e], consult on regulation for mandatory annual reporting of food waste by businesses and mandatory business targets for food waste prevention, and to provide £15 million to support food surplus and waste action[25]. Both regulatory proposals and consultations were delayed by the 2019 election and Coronavirus pandemic. The consultation on mandatory business reporting is expected in later 2020, with no date yet set for a consultation on binding targets.

FIGURE 3: THE FOOD USE HIERARCHY



e Ben Elliot was announced as the first Food Surplus and Waste Champion in December 2018[29]. He is also Chairman of the Conservative Party and co-founder of Quintessentially Group, a luxury lifestyle concierge service.

FIGURE 4: TIMELINE OF KEY FOOD WASTE INITIATIVES IN THE UK

2005 – The first phase of the Courtauld Commitment launches, targeted at household food waste reduction.

2010 – Phase 2 of the Courtauld Commitment expands to encompass business commitments to reduce food waste in the retail, manufacturing and catering sectors.

2013 – Courtauld Commitment 3 launches, aiming to further reduce the weight and carbon impact of household food waste, grocery products and packaging waste.

2015 – The UK, alongside 193 UN member states, adopts the 17 Sustainable Development Goals, including Target 12.3, to 'by 2030, halve per capita food waste'.

2016 – Courtauld 2025 launches with a 10 year commitment to cut carbon and waste associated with food and drink by at least one fifth, and to reduce water stress.

2018 – WRAP and the IGD launch 'Target, Measure, Act', or the 'Food Waste Reduction Roadmap', an industry roadmap, adopting the SDG 12.3 target to halve food loss and waste by 2030.

2019 – Defra and major food businesses sign the 'Step up to the Plate' initiative to halve food waste by 2030, following Defra's announcement of a £15 million fund to support resource efficiency projects.

WRAP reports that 156 food businesses have signed up to the Food Waste Reduction Roadmap, but only 40 businesses reported their food waste, with WRAP reporting that a further 500 major food businesses were needed to take part to enable the UK to achieve the SDG 12.3.

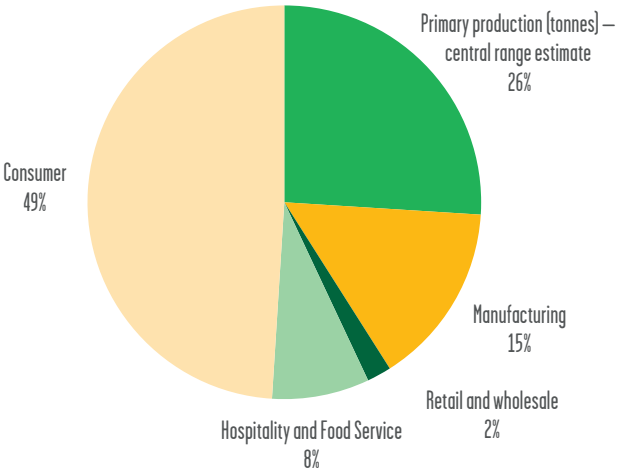
2020 – WRAP reports that 261 businesses have committed to the Roadmap and 171 have provided evidence that they are implementing it. 60 businesses report their food waste publicly, with 138 sharing data privately with WRAP.

HOW EFFECTIVE HAS FOOD WASTE ACTION BEEN TO DATE?

WRAP's Courtauld Commitment reports food waste reductions of 21% between 2007 and 2018[15], or around 2% per year. These reductions apply only to food waste in households, retail, hospitality and food service and manufacturing – they exclude food waste at farm-level, where up to a third of the UK's food waste occurs.

FIGURE 5: BREAKDOWN OF UK FOOD WASTE ACROSS THE SUPPLY CHAIN, WITH ESTIMATES OF FARM-LEVEL WASTE INCLUDED

UK food waste and surplus 'not redistributed', by supply chain stage (tonnes)



As there is no reliable baseline for waste on UK farms, an estimated range is used, and using the lowest or highest estimates, or including or excluding inedible food waste (and how this is defined), results in very different estimates for the proportions of food wasted at different levels of the supply chain. For example, food wasted in UK food businesses can range from 36% to 61% of overall waste, depending which measures and assumptions are used. While these issues may sound technical and insignificant, the volumes of food involved mean that they can have a considerable impact on the ambition of food waste reduction targets, as discussed below.

Between 2007 and 2018, WRAP estimates that GHG emissions savings associated with the reduction in avoidable food waste amounted to around 5.3 million tonnes of CO_2e a year[30]. Total UK emissions were about 451.5 $MtCO_2e$ in 2018[31], so this is equivalent to around 1% of UK emissions. If the UK achieves the current voluntary targets in WRAP's Food Waste Reduction Roadmap, Feedback estimates that this will generate roughly 5.7 million tonnes of CO_2e/year a year further savings by 2030 – about the same as has already been achieved through Courtauld to date. This is under the best-case scenario, where the Food Waste Reduction Roadmap receives full and vigorous participation from all 650 major food businesses in the UK. Whereas, currently, only around 260 businesses have signed up to the Food Waste Reduction Roadmap, and only 60 of these have reported on their food waste figures (see figure 3).

Food waste in retailers, hospitality and supply chains

Retail food waste has only decreased by 4.6% between 2009 and 2018, from 290,000 to 277,000 tonnes[15] – a 0.5% reduction per year.

Manufacturing food waste has decreased by a more impressive 20.8% between 2011 and 2018, from 1.9 to 1.5 million tonnes[15] – about a 3% reduction per year.

Hospitality and Food Service (HaFS) food waste has *increased* by 19.3% between 2011 and 2018, from 920,000 to 1.1 million tonnes[15] – a nearly 3% increase per year. This is just an estimate, however, because WRAP do not have robust enough data to tell the real change in HaFS food waste.

Total reduction from retail, manufacturing and HaFS: If WRAP's estimate of the increase in HaFS food waste is correct, this increase nearly completely wipes out the gains in manufacturing, meaning that between retail, manufacturing and HaFS, food businesses as a total have only reduced their food waste from 3.11 million tonnes in 2011 to 2.88 million tonnes in 2018, a 7% decrease overall or roughly ***1% decrease per year***.

There has been little to no progress on tackling **farm-level food waste**. There is no UK baseline for food waste in primary production, although, as mentioned, estimates from WRAP indicate that more food may be wasted on UK farms than in its retail, manufacturing and catering sectors put together – an estimated 3.6 million tonnes of food waste and surplus, and potentially up to 5 million tonnes[15]. This is a serious omission: despite these very large volumes, up to a third of total UK waste, farm-level waste remains outside the scope of food waste agreements due to lack of robust baseline data. Without a sector-wide approach, efforts to reduce farm-level food waste have been limited to single business initiatives, such as Tesco's identification of food waste hotspots in its supply chain, an exercise examining profiles for the top 25 most frequently purchased foods and the percentage of each wasted at different stages of the supply chain[32]. However, given the lack of baseline and ongoing measurement, any overall reductions in primary production food waste remain unknown. This could mean that over half of food waste is occurring in food businesses sidelined from national measurement and reduction targets, except for a small number of large primary producer businesses who have signed up to the Food Waste Reduction Roadmap. It is therefore essential that food waste in primary production is addressed to meaningfully contribute to climate change mitigation, farmers' incomes, and UK food security[33].

Thus, with the notable exception of manufacturing where there has been greater participation from food businesses and more resources dedicated to regular measurement, limited progress has been made in food waste reduction amongst businesses.

Food waste in homes

With regards to household-level waste, prior to the Covid-19 pandemic it appeared that progress on food waste in **households** had largely stalled. Between 2007 and 2012, household food waste fell by 15% due to rising food prices and the impacts of the 2008 financial crisis and subsequent austerity measures[34]. Progress then stalled between 2012 and 2015, with a slight downtick of 5.7% between 2015 and 2018, the last year for which full data is available[35]. The spring 2020 coronavirus lockdown and its impacts on household food behaviour appeared to create a surge in awareness of food waste and prevention at household level. Research by WRAP reported that many households were adopting behaviours likely to lead to less waste, such as pre-shop planning, better food storage and creative approaches to cooking and preparation. Just over one in three said that their household was throwing away less uneaten food[36]. Whether these behaviours will display longevity is yet to be seen – post-lockdown household food waste appears to have risen again, though not to levels seen before lockdown[37].

THE LIMITS OF VOLUNTARY AGREEMENTS

Various studies have thrown doubt on whether voluntary industry agreements, such as the Courtauld Commitments, are an effective substitute for regulation[38]. Most recently and persuasively, a report by MSI Integrity commented on the broad failure of multi-stakeholder initiatives to protect against abuse and achieve environmental and social outcomes[39]. A specific critique of the current voluntary approach to tackling business-level food waste in the UK is centred around the process by which the failure of voluntary agreements to achieve comprehensive coverage, transparency and action across businesses results in slow progress, which reinforces low levels of ambition for future progress. Meanwhile, the temptation to choose baselines and select data in ways which emphasise progress, rather than revealing limitations, prevents a clear-sighted view of the issues at stake.

Failure of voluntary agreements to achieve comprehensive coverage and transparency

One of the main goals of the UK's voluntary food waste initiatives has been the measurement, and publication, of business food waste data. A common mantra, 'you can't manage what you don't measure', has guided efforts to encourage food businesses of all sizes, but particularly larger food businesses, to properly measure their food waste data, and, having measured it, to publish it to create accountability. In 2013, Tesco became the world's first retailer to commit to publicly reporting their third-party audited food waste data[40]. But since then wider food and retail sector has shown a repeated pattern of commitments to transparency, followed by a retreat from action.

For example, in January 2014, Sainsburys, Asda, Morrisons M&S, Waitrose and Co-op committed to reporting their food waste figures[41]. However, when the figures were released in January 2015, they were only reported as an aggregate figure for the whole retail sector rather than on an individual company basis[42]. In a breakthrough in 2017, Tesco committed for the first time to publishing the food waste data for its 24 largest suppliers[43], and in September 2018 food waste data from 27 of Tesco's suppliers' was published, revealing combined wastage of 700,000 tonnes[44]. Reporting on food waste in large food businesses' supply chains is vital, to present a rounded picture of the drivers of food waste and to identify business practices, such as inaccurate forecasting, which increase the risk of waste.

In 2018, after calls from the House of Commons Environment, Food and Rural Affairs Select Committee for regulation on transparency[114], 89 businesses, including all the major supermarkets and numerous businesses ranging from manufacturers to farms, committed to publishing their individual food waste data by September 2019, under WRAP's Food Waste Reduction Roadmap. However, when the time came, only 40 businesses publicly reported their food waste figures, with the majority continuing to share figures behind industry closed doors[45].

Thus, in 2020, only 60 businesses in the UK have publicly reported their food waste data, with another 138 still sharing data in confidence with WRAP[46]: in other words, **15 years after the first voluntary agreement on food waste, under 10% of the 650 major UK food businesses have committed to real transparency on their food waste**. When it comes to transparency on waste in supply chains, progress has been positively glacial.

Slow progress on food waste reductions

In 2014, a WRAP analysis projected that the minimum achievable level of post-farmgate food waste was a 20% reduction from a 2015 baseline, or 30% reduction from a 2007 baseline, by 2025[47]. This analysis was based on historical reduction speeds, cost-benefit analyses and the assumption that the food sector as a whole would not be able to reduce waste below the level of the best performing business at the time. Plans for future progress are compromised by these conservative assumptions, and if primary production food waste continues to be locked out of national food waste reduction targets, then the rate of change will be slower still. These assumptions fail to consider the possibility that regulation could speed progress compared to voluntary agreements, that cost-benefit analyses will change if government penalties and incentives shift, or that best-practice could be substantially improved.

Changing baselines and limited scope

A major shortcoming of the Courtauld 2025 target was that it did not put the UK on track to meet SDG 12.3, which the UK adopted in 2015. It was therefore welcome when, in 2018, WRAP and IGD launched a newer, and apparently more ambitious, food waste voluntary agreement: the Food Waste Reduction Roadmap, which promises to deliver a 50% reduction in the UK's food waste by 2030. However, a closer examination of the Roadmap reveals that it actually aims to reduce post-farm-gate food waste from 10.2 million tonnes in 2015 to 7.7 million tonnes in 2030[30,48] – 15 years for a 24% decrease in volume or 30% decrease per capita[f]. This target can be presented as a 50% reduction through a combination of techniques, which cumulatively water down the target's ambition:

- Use a baseline from 2007 onwards, rather than 2015 onwards (when the SDG was adopted), meaning any food waste reduction between 2007-15 already counts towards the 50% reduction;
- Measure food waste per capita, and use a 2007 baseline for the UK population – meaning that the difference between population in 2007-15 makes the target easier to achieve;
- Aim for a 50% reduction in edible food waste – rather than a 50% reduction in inedible and edible food waste (which would in practice require a more than 50% decrease in edible food waste).

An example of the extent to which this affects the apparent ambition of the UK's targets is that when it launched in 2016, Courtauld 2025 was originally presented as achieving a 20% reduction in UK food waste by 2025[49]. However, under WRAP's new methodology, Courtauld 2025 achieves a 40% reduction in food waste[15], despite there being no changes to the tonnage of food waste the agreement aims to reduce by 2025. While within the guidance for best practice for interpreting SDG 12.3, this propensity to move the goalposts has serious global implications for food waste reduction[50].

Compounding these moving goalposts is the limited scope of these targets, which do not include farm-level waste. This exclusion further dilutes the ambition, and capacity to achieve progress, of voluntary business targets, whatever their baseline. In combination, these factors greatly dilute the ambition of how the SDG 12.3 is interpreted at country-level.

WHAT IS HOLDING BACK EFFECTIVE ACTION ON FOOD WASTE?

Progress on food waste reduction has simply failed to match rhetoric and the UK's global reputation as a food waste leader. A decade in which a long list of commitments and targets has failed to make a significant dent in the UK's food waste figures may indicate that current approaches are unlikely to deliver greater reductions. There are four key limitations to these approaches, identified below.

Limit 1: A misdirected focus on citizen behaviour change, outside of food environments

The understanding that the majority of UK food waste occurs at household level has led considerable resources to be directed at changing the food behaviours of citizens to reduce waste. These initiatives include awareness raising campaigns on food waste, or tips and gadgets for household food reduction, such as fridge thermometers or pasta serving measurers. There is a clear financial incentive for household food waste prevention (the average UK household spends £500 a year on wasted food[35]). In addition, most people say they want to stop wasting food: in a recent survey 87% agreed that 'food waste is an important national issue' and 93% agreed that 'everyone, including me, has a responsibility to minimise the food they throw away'[36]. Yet UK households continue to throw away 6.6 million tonnes of food per year. Why is this?

Food waste in households can be defined either as a problem of poor planning and over-purchase – people buying too much food then failing to use it – or as one of poor understanding of the best storage and use of food once it is in the home, misunderstanding, for example, around best practice on interpreting date labels. Much of the focus to date has been on initiatives tackling the latter, rather than the former, despite the fact that the root cause of unused food in the home is bringing too much food back into the home in the first place: over-purchase.

While there have been a few specific interventions to tackle over-purchase by some retailers, such as ending promotional offers on perishable products[51], these remain the exception rather than the norm. The supermarket form – with its extensive choice, year-round and day and night availability, and emphasis on low costs and savings, especially through buying greater quantities – has undoubtedly shaped the UK's shopping habits, including the tendency to over-purchase.

Nearly everyone in the UK does the majority of their food shopping in a supermarket: 75% say they visit supermarkets twice or more a week[52]. The supermarket also continues to influence how citizens engage with their food once it is in their homes, through branding, package sizes and labelling, all of which contribute to how UK citizens value their food, and to high levels of food waste in households. As one example, date labelling is a recognised factor in household waste generation: around 2 million

f Population statistics sourced from: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates

tonnes of food a year is thrown away in households due to 'not being used in time', and for a third of this, the date label is cited as a factor[53]. WRAP has estimated that changes to products and labelling could prevent around 350,000 tonnes of avoidable food waste, with a value of around £1 billion a year[54]. Insufficient information is provided to citizens on the difference between 'use-by' and 'best-before', date labels are used for foods which do not require them, such as fresh produce, and date labels are in many cases excessively cautious. Extending product life by only 24 hours could prevent 250,000 tonnes of food from being wasted[55]. The retailers' and manufacturers' approach to date labelling can therefore create wasteful behaviour in the home. A useful analogy is found in progressive public health approaches to addressing "obesogenic environments" (i.e. the pool of factors that create the conditions conducive of childhood obesity)[56]. The UK's food environment is a 'wastogenic' environment, shaped by the dominant way in which UK citizens engage with food, through supermarkets and brands. Some factors that could be considered as 'wastogenic' include: food prices that do not reflect its social and environmental burden; an expectation of 24/7 and all year availability; large packaging sizes; large variety of products. Behaviour change interventions that do not engage directly with the 'wastogenic' environment in which food purchasing and relationship to food in the home occur are doomed to be marginal in their effectiveness.

Limit 2: The mistaken conflation of food redistribution and food waste prevention

A recent press release from Defra notes that "Every year, 190,000 tonnes of edible food goes to waste from retailers and manufacturers which could be redistributed"[57]. This statement both vastly underestimates the true scale of food waste in the supply chain – as explored above – and ignores the fact that instead of being redistributed, this waste could have been prevented.

Despite Defra's food use hierarchy, which clearly states that prevention is the most effective intervention for avoiding food waste[58], most of the government's interventions to date have focused on redistribution rather than prevention, that is to say, lower down the hierarchy. In October 2018, the then-Secretary of State, Michael Gove, announced £15 million worth of funding to address food waste. The first round of the scheme saw £4 million awarded to four redistribution organisations to increase capacity and overcome barriers to redistribution[59]. A further £3 million was distributed via WRAP to 17 redistribution organisations, £1.15 million was made available for citizen food waste prevention projects and for piloting methods to create useful materials out of food that would otherwise be wasted, and a subsequent £2 million to respond specifically to redistributing food during the coronavirus outbreak[57]. So far, none of the funding has been earmarked for projects

which are purely directed at *preventing* food waste from arising in the first place: the food waste action with the greatest environmental potential.

Naturally, food that is unavoidable surplus, and that is edible, should be eaten by people where possible. However, suggesting that food surplus redistribution is a means to address poverty, and using redistribution as a fig leaf to avoid directly confronting the scale of food unnecessarily becoming surplus in the UK, is unacceptable. Framing food poverty and supply chain food waste as two sides of the same coin is a popular political message, but one that obscures the truth of the matter: food poverty is simply poverty, to be addressed through interventions to reduce inequality and bolster the social safety net. Food waste, on the other hand, has its roots elsewhere. Neither is a solution to the other. By focusing attention and funding on redistribution, the government, and food businesses, avoid difficult questions about why so much surplus food is arising in our food system in the first place.

Limit 3: A reluctance to use measures that would constitute a cost to retailers

Despite the framework of the food use hierarchy and Waste Regulations (2012), and the commitment to SDG 12.3, the UK government has so far adopted a voluntary approach to food waste prevention. This has primarily been expressed through its financial support to WRAP, which convenes the Courtauld Commitments, as well as more recently through Defra's £15million fund for food waste action, as outlined above.

There are several arguments in favour of voluntary measures over regulatory interventions. For businesses, voluntary initiatives give them more flexibility to introduce policies on their terms and in a way which fits with their business practice, and the possibility to make interventions central to market positioning – as is the case with Tesco, which has made food waste prevention a key part of its brand. For governments, voluntary arrangements require less oversight than regulation, and do not come with policy and enforcement costs[60]. Voluntary initiatives can further provide an evidence base for future intervention: the fact that Tesco has been publishing its full food waste data for seven years no doubt gave the government confidence in the viability of introducing sector-wide mandatory food waste targets and reporting requirements, pending the results of the forthcoming consultation[25].

While the arguments in favour of voluntary business interventions over regulation are clear, the argument against them is perhaps stronger still: they do not work. As we have seen above, voluntary initiatives have made only a small dent in food waste reduction. Tesco's food waste initiatives have not been replicated amongst its competitors, leading former CEO Dave Lewis to call on the government to intervene:

> *"Publishing food waste data is vital and must be mandatory if the UK is to achieve SDG 12.3 to halve food waste by 2030. The Government has indicated it will introduce mandatory reporting and we call on them to do this urgently."*
> Tesco PLC, 2019[61]

This intervention from Tesco's CEO dispels the myth of the private sector's attachment to minimal 'red tape' – rather it reveals a preference for government intervention, where it can raise environmental standards across the board. On the other hand, the government's emphasis over the last decade on voluntary interventions amounts to a refusal to compel food businesses to take action on food waste, should this adversely affect their bottom line. With voluntary measures, businesses can adopt measures when it suits their commercial objectives, or not, when it does not. In that sense, it is not surprising that Tesco's leadership on food waste has not cascaded across the sector: with food waste prevention so central to Tesco's brand, Tesco may have shrunk the space for its competitors to also make it their issue. Sainsbury's, for example, dropped its initiatives and communications on household food waste in 2018, rolling food waste into its wider 'live well' brand messaging[62].

The government's refusal to impose costs on supermarkets with regards to food waste is also evidenced by its direct interventions on food redistribution. While Defra's food waste action funds have been allocated to charitable organisations doing some valuable work, they were explicitly disbursed to help make charitable redistribution of supermarket food surplus more cost effective. Waitrose admitted to the House of Lords enquiry into food waste that "there is a clear temptation, on economic grounds, to prioritise energy recovery [i.e. Anaerobic Digestion] over redistribution"[63]. In the year the government announced their £15 million funding scheme, Tesco alone announced profits of £1.64bn[64]. The government could enforce the food use hierarchy, and compel supermarkets to redistribute surplus ahead of other forms of disposal, at their own expense: instead, it preferred to subsidise this disposal through the charitable sector. A recent example of the operation of this framework is found in a new partnership between Tesco and food waste charity Olio, which mobilises volunteers to collect and distribute surplus food via its app. Volunteers will collect surplus food from all Tesco's UK branches, take it home, then upload it to the app to be accessed by others[65]: effectively an army of free volunteer labour to dispose of Tesco's own waste.

The effectiveness of interventions on food waste has been limited by voluntary measures, adopted by businesses only when they support commercial objectives – or when the cost of the intervention is borne by the public purse.

Limit 4: A reluctance to address the root causes of food waste

Food waste across the supply chain is typically construed in policy terms as a waste disposal problem, requiring a technical solution, as a 'solution' to food poverty, requiring charitable funding, or as a 'consumer' behaviour problem, requiring 'nudges' to change behaviour. WRAP's latest funding for household-level food waste prevention projects focuses precisely on this behavioural change element[66]. These incomplete technical, behavioural and charitable approaches tend to mask the wider structural issues that lead to food waste: principally, a groceries' market dominated by a handful of very powerful retailers.

Food waste is a problem of the supermarket age: today four retailers control 66% of the groceries market share[67] and at least three out of four citizens visited a supermarket at least once in the last week[52]. The scale and pervasiveness of today's food waste is simply not something that previous generations, who shopped differently, would recognise.

For supermarkets, food waste generation is both a product of their business model and their structure. Their business model is one of selling large volumes of low-cost products, with a promise of a very large choice of products, continually available, at low price. This has led to a downward pressure on shop prices, as retailers seek to out-compete one another, particularly with the advent of the discounters, ALDI and Lidl, and to continued consolidation of the industry. The structure of supermarkets, many of them listed companies, makes them beholden to growth, to drive returns to their shareholders. Both these factors drive the retail of growing volumes of food, and the overall growth of the UK grocery market. Combined with a regulatory regime that gives retailers carte blanche to generate food waste both up and down their supply chains, at no cost, these factors propel the generation of food waste from farm to fork.

While some of the food waste in primary production is due to what may be termed 'natural causes', such as gluts due to weather conditions, there is strong evidence that supermarkets are a major driver of food waste on farms, where up to a third of food waste occurs[68]. Investigative research in food supply chains, both internationally and in the UK, has consistently shown that supermarkets' trading stipulations are a leading cause of farm level surplus[33,69]. These include order cancellations, last minute changes to forecasts, retrospective changes to supply agreements and the use of cosmetic specifications (requirements for food shape, size and colour). Some of these trading practices are deemed 'unfair', that is to say, they deviate from commercial good conduct.

More telling than specific unfair incidents where waste occurs and excessive costs are incurred by farmers, or other producers, is the *habitual* phenomenon of overproduction. In the current, highly concentrated groceries' market, with a very limited outlet for crops and products, farming business models require high levels of overproduction, and associated waste, to make sure orders are reliably fulfilled.

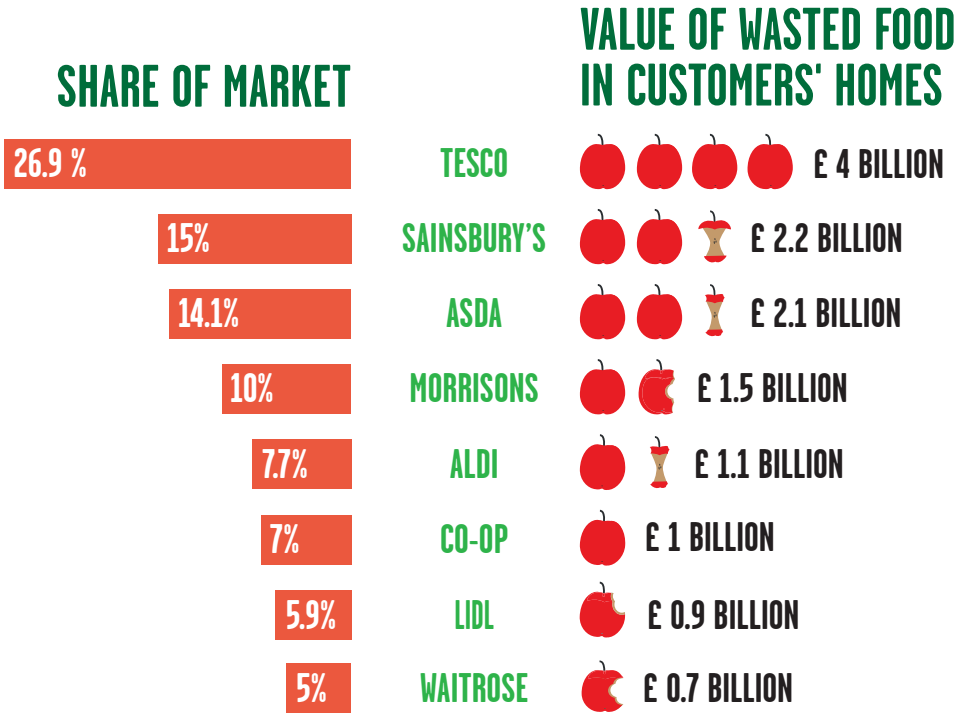
> *"From my experience, when I used to supply the supermarkets you generally grew about a third more than you thought you would sell, just to make sure that the supermarket buyer didn't have a tantrum if you ran short, and so routinely you have more than you can sell and so you just mow it off and plough it in – that's the normal thing to do."*
> Guy Watson-Singh, Riverford Organic[70]

Retailers use forecasting to ensure a continuously high level of availability – with permanently stocked shelves a key component of their offer – but evade responsibility for food which they later find they will not be able to sell, which then constitutes a cost to the farmer. In an alternative food marketplace, availability may be variable, and shops may sometimes run out of stock – but this is not the promise of the supermarket, and would not generate the custom required for their business model.

While supermarkets may drive waste in their suppliers' businesses, it is telling that waste occurring within their own operation only represents a fraction of the UK's overall food waste. Only 3% of total UK food waste (excluding primary production) arises directly in retail[30] This is because disposing of said waste represents a logistical challenge and cost to the business, and there is therefore a strong financial case to minimise waste arising directly in their own operations. Tesco, again leading the way on retailer action on food waste, has recognised their role in supply chain waste and worked with their suppliers to expand food waste reporting to 71 of its largest suppliers around the world[71]. Only by providing consistent reporting of waste, not only in their own direct operations, but also in their supply chains, can supermarkets provide real transparency on the extent of waste they are responsible for.

With regard to customers, there is no financial incentive for retailers to minimise waste in households. Quite the reverse, in fact, and selling food to customers that is subsequently wasted is lucrative. Household food waste is worth around £14.9 billion a year[72] – if this disappeared overnight it would represent a considerable loss to the retailers who primarily supply it. While WRAP has sought to argue that there is a business case for food waste prevention, seeking to make an argument that less food waste in the home could result in future sales of higher value products[73], this case is tenuous at best. Over-purchase, and subsequent waste, are an integral part of the supermarket business model. To give an indication of the scale of food sales that food waste represents for each major retailer, we divided the £14.9bn spent by the public on wasted food in 2015, by the approximate market share of the UK's top eight retailers. Tesco, the UK's biggest supermarket, would have sold its customers roughly £4bn worth of wasted food in 2015, around 7% of the company's £55.9bn sales excluding fuel and VAT[74]. The commercial case for food waste generation in the home is unequivocal.

FIGURE 6: ANNUAL VALUE OF WASTED FOOD IN HOMES BY SUPERMARKET (BASED ON MARKET SHARE, 2015)



Source of market data[75]

BOX 2: DUBIOUS DATE LABELLING AND THE COMMERCIAL ATTRACTION OF OVERSELLING

In 2018 Feedback ran a campaign highlighting the effects of overly cautious date labels on perishable products like milk, which drive food waste in the home and lead to excessive purchasing. Our research suggested that milk, if stored properly, is still safe for human consumption seven days past its 'Use By' date – despite the fact 'Use By' dates are meant to be used as an indication of product safety. We made the simple but obvious point that it is of financial benefit to supermarkets for people to visit more often and purchase more products. Milk is an example of a loss leader, an 'essential' product sold at a low price which drives visits to shops, during which customers buy other items, increasing sales. It is entirely to supermarkets' advantage to make use of labels which educate citizens to believe in the idea of a short product life, requiring more frequent visits to the shops, with the decision on when milk is 'off' delegated to labels rather than their own senses.

The tension between profit maximisation and shareholder returns, and ecological and climate imperatives – like food waste – shows a clear winner: food waste remains ingrained in supply chains and homes. For policy makers, high levels of food waste from farm to fork point to a reluctance to critically examine corporate profit maximisation as the organising principle of the food economy, precluding the more far reaching interventions that would be required for a food system that is less wasteful, and which operates within ecological limits and the climate imperative.

3. WHAT DOES A MORE AMBITIOUS FOOD WASTE POLICY AGENDA LOOK LIKE?

To date, food waste as a climate issue has received little policy attention. Nor has food waste been integrated into a national food policy for England (though this may change with the publication of the full National Food Strategy, in early 2021, and the government's response to this work). By recognising food waste action as a climate solution, it becomes possible to both realise its potential and to open the policy space to more radical and effective solutions than have been explored so far.

Vitally, there is, and has always been, public support for government regulatory action on food waste. Most recently, the UK's Climate Assembly's final report noted that 72% of participants supported taxes and incentives to reduce food waste[76]. The Champions 12.3 October 2020 'Call to Global Action on Food Loss and Waste' calls for food waste reduction to be integrated into climate strategies and into government responses to Covid-19 and the opportunity to 'build back better'[23].

With the limits of voluntary and industry-led approaches reached, fresh leadership on food waste must now come from policy makers and regulators. The task before them is not only to curb waste in the current food system as much as possible, but also to explore and enable new, low waste and circular approaches to getting food to our plates. Their imagination cannot remain checked by assumptions about what is possible within current food system paradigms.

Just as the Covid-19 pandemic has forced us, as individuals and a society, to rethink what is possible and what is necessary to ensure our individual and collective health and security, the climate crisis requires us all to urgently rethink assumptions and to bend every tool available to us to the task of decarbonising our economy.

We cannot accept 'business as usual' approaches to food waste, which will hinder the achievement of net zero.

To realise the potential of food waste action, the UK must:

1. **Integrate ambitious food waste reduction targets, in line with the goal to halve food waste throughout the supply chain by 2030 against a 2015 baseline, into climate strategies and legislation;**
2. **Harness and enforce existing waste legislation and implement the ambitions set out in the Waste and Resources Strategy;**
3. **Capitalise on the opportunities of new food and farming policy to support food waste prevention on farms;**
4. **Harness market frameworks and business practices for food waste prevention chain;**
5. **Put in place the conditions for transformative change in the groceries market.**

RECOMMENDATION 1: INTEGRATE AMBITIOUS FOOD WASTE REDUCTION TARGETS, IN LINE WITH THE GOAL TO HALVE FOOD WASTE THROUGHOUT THE SUPPLY CHAIN BY 2030, INTO CLIMATE STRATEGIES AND LEGISLATION

1.1 Adopt an ambitious food waste goal in the UK's 2020 NDC, including a national binding target to reduce food waste (both edible and inedible) by 50% from farm to fork by 2030, against 2015 baselines.

A year before the delayed COP 26 negotiations take place in Glasgow in November 2021, the UK faces a unique opportunity. Food has been largely neglected in climate policy, despite the massive potential of food systems change for climate mitigation. In developing its enhanced NDC to the Paris Agreement, and in setting out its path to Net Zero national emissions, the UK must incorporate bold action on food waste into its climate arsenal. The UK

needs a national, binding target to halve food waste across all levels of the supply chain, integrated into government policy via a cross-departmental strategy, and backed by legislation. Not only will this help set the UK on a course for climate action commensurate with the scale of the global challenge we face, it will also demonstrate to other parties at the UNFCCC conference that action on food systems should be firmly on the table when designing their own climate policy.

Feedback recommends that the UK adopt an ambitious interpretation of SDG 12.3: a binding national target to reduce all UK food waste (edible and inedible) by 50% from farm to fork by 2030, against 2015 baselines. This would require a reduction in UK food waste from an estimated 11.8 million tonnes in 2015 to roughly 5.9 million tonnes in 2030[g], for all sectors including primary production. The UK is currently on course to reduce post-farmgate food waste by only 2.5 million tonnes between 2015 and 2030.

The SDG 12.3 is ambiguous in its wording, however, Champions 12.3 best practice recommends that "one should apply the "halve per capita" in practice to food losses [i.e. pre-retail food waste], as well, not just to food waste" – and that this should cover "from the point that crops and livestock are ready for harvest or slaughter"[50]. Feedback's recommendations are in line with this best practice. Feedback recommend that 2015 is used as the baseline year for action, as this is the year that the UK adopted the SDG 12.3. Using a 2007 baseline year significantly dilutes the ambition of the target, since the per capita reduction starts from both a higher level of food waste and a lower population. Using a 2015 baseline does not invalidate the good work achieved between 2007-2015, but instead builds on it. We should not look at the rate of change that has been achieved historically by voluntary agreements, and pick the baseline year to fit with the assumption this is the limit of what can be achieved in the future – this is to put the cart before the horse. 15 years should be long enough to achieve a 50% reduction per capita (just over 3% per year). WRAP's interpretation also proposes a 50% reduction only in *edible* food waste, which is in line with Champions 12.3 guidance[h] – however, Feedback recommend that the more ambitious approach of a 50% reduction in edible and inedible food is taken (in practice, meaning an over 50% reduction in edible food waste). This is feasible, because over 70% of food waste is edible: preventing this food from being wasted would involve fully implementing the hierarchy of prevention, redistribution and use for animal feed.

1.2 Model and implement an ambitious policy pathway to achieve a 50% reduction in food waste by 2030

The CCC recently increased the ambition of its food waste modelling from 20% to 50%, bringing it in line with the SDG adopted by the UK in 2015. However, the CCC's 50% target is based on WRAP's interpretation of SDG 12.3. Feedback recommends that the government requests the CCC uses its current 50% target as a 'low ambition' pathway, and models a further 'high ambition' pathway based on the target recommendations above. Policy recommendations to reach this target should also be developed. The CCC's current food waste policy recommendations include making existing businesses pledges mandatory and requiring universal separate food waste collection in household waste collection. These are minimum steps and should be adopted: as this report goes to press the Government is consulting on introducing mandatory separate food waste collections in England, and Feedback recommends that this policy is adopted, alongside support and funding to local authorities to enable its implementation. Separate food waste collection is already mandatory in Wales, and in Northern Ireland it is a statutory requirement for all councils to provide households with a container for food waste[77]. Further recommendations for reaching a high ambition target on food waste are set out further down in this report.

RECOMMENDATION 2: HARNESS AND ENFORCE EXISTING WASTE LEGISLATION AND IMPLEMENT THE AMBITIONS SET OUT IN THE WASTE AND RESOURCES STRATEGY

2.1 Develop an effective, UK-wide food waste data baseline, including funding top-down approaches to collecting data in hard to measure sectors such as hospitality and on farms.

An immediate first step for food waste prevention concerns developing a robust data baseline. Government must provide sufficient funding, alongside mandatory business measurement of food waste, to develop a comprehensive baseline for UK food waste. This funding should target hard to measure sectors, such as HaFS, where the sector is fragmented and many small businesses do not have the resources to effectively measure or report on their waste, and primary production. Box 3 describes how this could be done.

g This is modelled in the LCA conducted by researchers at Bangor University, commissioned by Feedback – see the paper for a more detailed breakdown of food waste destinations in the 'Circular" scenario [2 Table 2]

h The guidance states that "if entities are able to measure and report on food and associated inedible parts separately, then they should be able to apply the 50 percent reduction target only to the food portion" [50]

BOX 3: GOVERNMENT SUPPORT FOR COMPREHENSIVE NATIONAL FOOD WASTE MEASUREMENT

If mandatory food waste reporting is introduced for all sectors, then a substantial volume of data will be provided to government by large food businesses. However, in some sectors where a higher degree of fragmentation exists, such as HaFS and primary production, additional government support will be required to ensure that an accurate national picture of waste in the sector as a whole is gained. Smaller businesses may not have the resources and economies of scale to measure their food waste[78] and therefore some system of sampling will be required, carried out by government-funded third party auditors.

It is also very important that the government invest in research into the causes of food waste. This issue may need to be dealt with sensitively, possibly through anonymised reporting methods. This could be conducted via the Groceries Code Adjudicator, or another similar body which is set up to conduct confidential interviews and has developed a position of trust with businesses. The reason for this is that many businesses, such as farms, experience high levels of food waste in part because of the policies of other businesses such as supermarkets – Feedback have found evidence that many farmers experience significant waste as a result of last minute order cancellations, cosmetic rejections and perverse incentives to overproduce[33]. It is thus also important that businesses are not blamed entirely for the food waste that occurs on their premises, as the causes may be partially found elsewhere. Impartial mediation between businesses could help ensure solutions can be found. Regulation may be required to ensure meaningful improvements, such as an extension of the remit of the Groceries Code Adjudicator to protect suppliers against poor practices which specifically lead to supply chain food waste.

Government support will be particularly necessary for the primary production sector. To date, no country in the world has measured a robust national baseline for primary production food waste – generating such a baseline in the UK would therefore represent a global breakthrough. Many studies have shown that primary production food waste in Europe and the US is likely to be very high, with some studies finding it is up to 57% of overall food waste[79–83]. Measurement of food waste at primary production is highly feasible. North Carolina State University provide clear guidance for how to measure harvest food waste[79] and WRAP and LEAF's 'Food Waste Matters' gives guidance on how to take measurements of harvest food waste[84]. WRAP have already conducted accurate studies of food waste at primary production for some core commodities[85]: more funding is needed to enable this to be extended comprehensively.

2.2 Bring forward the government's plans to make food waste reporting and reduction targets mandatory for all large businesses, in line with an ambitious UK target to reduce food waste from farm to fork by 50% by 2030, against a 2015 baseline.

2.2.1 Introduce mandatory business food waste measurement and reporting

Feedback recommends that the government urgently implements regulation to require mandatory measurement and public reporting of food waste data by food businesses, as proposed in the Resources and Waste Strategy 2018, as this is an area where voluntary initiatives have clearly failed to achieve the urgent progress required.

Businesses who already have food waste data available and have to date been reporting privately to WRAP, or not reporting at all, should be required to publicly report this data by the end of 2021. Businesses who have yet to generate food waste data, should be required to measure their food waste in 2021, and report this publicly no later than 2022.

Mandatory food waste reporting by businesses will create a level of public accountability which may help provide an incentive for businesses to reduce their food waste, and that of their suppliers. Equally importantly, it will provide data to allow a clear view of food waste occurring nationally in each sector.

It is vital that large food businesses in primary production are included in this mandatory food waste measurement and public reporting. Currently, due to lack of robust data to form a baseline, primary production food waste is locked out of the UK's national food waste reduction targets. Some measurable action does occur at individual business level, but currently there is very low participation amongst primary producers in WRAP's Food Waste Reduction Roadmap. WRAP's estimates suggest potentially more food may be wasted at primary production than in UK retail, manufacturing and HaFS sectors combined. In addition, approximately 2 million tonnes of food surplus occurs on farms – much of this food edible to humans which is instead fed to livestock as animal feed, and thus used significantly below its potential. A survey of UK farmers by Feedback found that respondents were experiencing waste levels on average of 10-16% of their crop[33]. Making it mandatory for large primary producers to measure and publicly report their food waste could help the UK become the first country in the world to generate accurate baseline data for primary production food waste (see box 3).

2.2.2 Introduce mandatory food waste reduction targets for large food businesses

Feedback recommends that it be compulsory for all large food businesses to commit to food waste reduction activities, with financial penalties for inaction. The UK's voluntary commitments have been marred by low participation, introducing the risk of non-participants and free riders slowing general progress and putting a downward pressure on the ambition of national targets because of the need to attract participation. Making it compulsory for food businesses to adopt food waste targets incentivises participation in voluntary agreements, and introducing penalties for inaction would level the playing field for all businesses.

2.3 Put in place the regulatory, fiscal and enforcement regime to operationalise the food use hierarchy, as per the 'polluter pays' principle

The food use hierarchy should be enshrined in law and operationalised through fiscal policies. This is primarily about applying the principle of 'polluter pays' to food surplus and waste disposal, so that it is always more financially viable to firstly, prevent, or secondly, redistribute, food, rather than dispose of it. The Environment Agency should be sufficiently funded and resourced to enforce the hierarchy. Legal frameworks and fiscal incentives ought to be aligned with the food use hierarchy[58].

- **Prevention:** At the top of the hierarchy, funding for food waste prevention activities should be significantly expanded: as discussed earlier in this brief, prevention is always the first and best option. Additional funding for food waste prevention and measurement could be funded by the increase in taxes on landfill and incineration.
- **Redistribution:** While the focus should remain on food waste prevention, all edible food must first be used for human consumption, which will require some level of redistribution. In the case of surplus, there are already many strong initiatives for food redistribution: these should be supported to ensure human edible food never goes to waste, but only inasmuch as redistribution neither distracts from prevention, nor from the institution of policies to reduce inequality and to bolster the social safety net.
- **Animal feed:** In the case of unavoidable, human inedible surplus, Feedback recommends that the law is reformed to enable safely treated surplus food to be fed to omnivorous non-ruminants like pigs and chickens (see box 4). Sending food waste to animal feed saves approximately three times more emissions than sending it to AD[3], yet there is little incentive for business currently to prioritise animal feed over disposal via AD. In addition, careful attention should be paid to ensuring that the use of food waste as animal feed, including to feed insects for animal feed, does not support continued high levels of meat consumption, at a time when reducing meat consumption is a priority for public health and climate mitigation [12,86].
- **Anaerobic Digestion:** As a last resort, unavoidable food waste unfit for human or animal consumption should be sent to AD (a process of breaking down organic matter to produce bio-gas and a remainder known as digestate). The practice of corporate disposal of large quantities of food to (AD) plants should be strongly penalised. Feedback recommends that AD subsidies are carefully limited to ensure that they do not distort the food use hierarchy and inadvertently direct food from human consumption or animal feed (see box 4). Feedback have found worrying instances where food edible to humans or animals has been diverted to AD plants [3]. Government funding priorities currently give mixed messages: subsidies of AD plants under renewable energy incentive schemes have resulted in some individual AD plants collecting over £10 million in subsidies over 20 years, whilst government funding for food waste prevention has been cut[i]. AD digestate should also be used as a fertiliser wherever possible, to maximise its benefits.
- **Landfill:** The government should adopt policy to ensure zero food waste goes to landfill or incineration by 2030 [25] (see below).

BOX 4: ESTABLISHING THE 'SUSTAINABLE NICHE' OF FOOD WASTE TO ANIMAL FEED AND AD

While it is impossible to prevent food surplus entirely, and there is therefore an important role for alternative, environmentally optimised uses for it, such as animal feed and AD, policy and regulation plays a vital role in keeping these industries within their 'sustainable niche'. This means preventing market forces from distorting incentive structures and creating a situation in which certain uses for food surplus become more commercially attractive than action on prevention, or at other higher stages of the food use hierarchy. The AD industry provides a good example of how things can go wrong: substantially subsidised under green energy incentives in the early 2010s, the AD industry now plans further growth, increasing its demands for feedstocks such as food waste. Yet an LCA commissioned by Feedback found that the role of AD in a 'climate-optimised' net zero context is likely to be far smaller than the one the industry envisages for itself[3]. Another example lies in the best use of food surplus for animal feed. The UK currently bans feeding surplus food from catering, or any source which may contain meat, to omnivorous animals like pigs and chickens. Whilst the ban was originally put in place as a result of Foot and Mouth Disease (FMD), subsequent evidence has been found that an updated, tightly regulated system could deliver "eco-feed" produced from safely treated surplus food, based on the model used in Japan[89–91]. Displacing conventional feed ingredients, such as imported soya, could deliver considerable environmental benefits[92] and Feedback estimate that, if the current ban on feeding surplus food from catering and other sources to omnivorous animals like pigs was lifted, a combined total of 2.5 million tonnes of surplus food from UK manufacturing, retail and commercial catering could potentially be fed to pigs[92]. However, this approach would need to be carefully balanced with the vital imperative to reduce overall meat consumption, in order to lessen the planetary burden of our agricultural system. Feedback, in line with national coalition Eating Better, recommends a 50% reduction in meat and dairy consumption by 2030, alongside a 'less and better' approach.

i For instance, WRAP's total government funding has been cut to a fifth of the level it was in 2010, to under £10 million per year – this covers all of its projects, not just limited to food waste [87,88]. The £15 million food waste redistribution fund announced in 2019 is a fraction of the money spent on subsidising AD, as well as being focused on redistribution as a sticking plaster to both food waste and food poverty rather than designing food waste out of the system in the first place.

2.4 Extend the government's ambition to eliminate food waste in landfill or to incineration by 2030, to support a genuinely circular economy

Devolved governments have already moved ahead in this direction, with Scotland implementing a landfill ban on all biodegradable municipal waste by 2021. However, stronger regulation by devolved and national governments is needed to ensure that business and household food waste does not enter landfill or incineration. This can be achieved by increasing costs associated with landfill and incineration, making AD a genuine last resort for disposal of organic waste. With regards to landfill, Feedback recommends increasing landfill tax substantially. This will both support the government's ambition to end food waste to landfill by 2030[93], help in efforts to halve UK food waste by 2030 and push food up the food use hierarchy.

However, it is vital that food is not simply displaced from landfill to incineration. Incineration releases significant amounts of greenhouse gases, and 'wet' food waste in incinerators relies on plastics to burn effectively, further increasing the greenhouse gas burden[94]. In the short term, Feedback strongly recommends a tax on incineration on a par with an enhanced landfill tax. In early 2020, a broad cross-party group of MPs called for an incineration tax to be introduced[95]. Responses to a government consultation in 2018 showed "overwhelming support" from the public for measures including using taxes to encourage "further recycling as opposed to incineration"[96].

In the medium and long term, however, incineration taxation will be insufficient, and a planned phase out of waste incineration will be required. This is because incineration presents an insurmountable barrier to the circular economy, by burning wastes, and therefore precluding reuse or recycling opportunities.

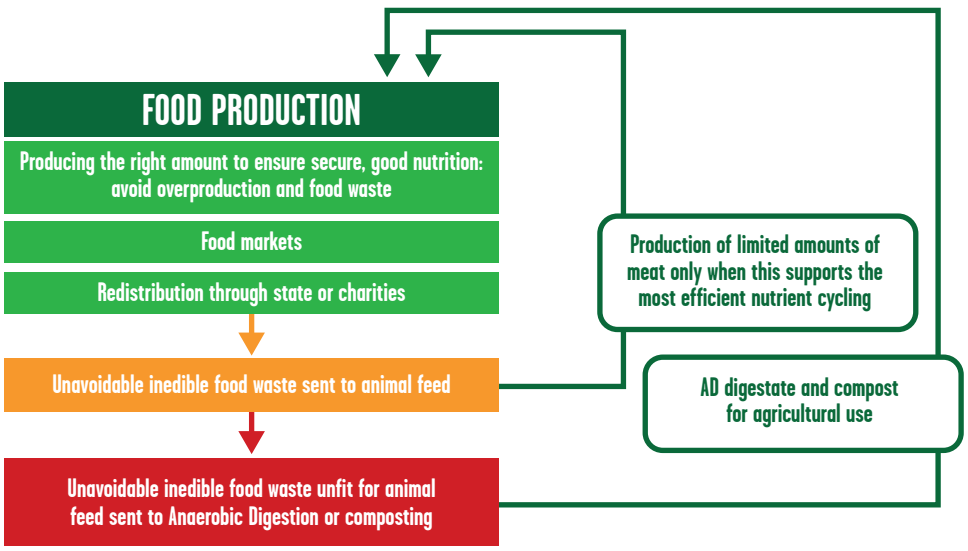
In the words of Prof Sir Ian Boyd, former Chief Scientific Advisor to Defra:

> *"If there is one way of quickly extinguishing the value in a material, it is to stick it in an incinerator and burn it. It may give you energy out at the end of the day, but some of those materials, even if they are plastics, with a little ingenuity, can be given more positive value. One thing that worries me is that we are taking these materials, we are putting them in incinerators, we are losing them forever and we are creating carbon dioxide out of them, which is not a great thing…I think that incineration is not a good direction to go in."*
>
> Prof. Sir Ian Boyd, former Chief Scientific Advisor to Defra[97]

As capital-intensive infrastructure, incinerators often come with long pay back periods, and act as a disincentive to waste prevention and recycling: this dynamic also applies to food waste. Burning food waste distracts from food waste prevention, and misses the opportunity to repurpose non-edible food waste as animal feed, or, as a last resort, bring it to AD. Crucially, there is an opportunity cost of burning waste rather than repurposing it as agricultural compost, which would displace the use of fertilisers and help support longer term soil fertility. The potential of community and municipal composting of inedible, unavoidable food waste is poorly understood and should be further explored: this is an opportunity to close the nutrient cycle loop, and move towards a circular economy in food production.

To avoid the current pitfalls and false incentives which may be created by the linear food use hierarchy – for example, high availability of surplus food suitable for animal feed driving excessive livestock production by reducing feed costs – Feedback proposes a revised, circular food use hierarchy (see figure 7).

FIGURE 7: A CIRCULAR FOOD USE HIERARCHY



Credit: Feedback, 2020

RECOMMENDATION 3: CAPITALISE ON THE OPPORTUNITIES OF POST-BREXIT FOOD AND FARMING POLICY TO SUPPORT FOOD WASTE PREVENTION IN PRIMARY PRODUCTION

3.1 Instrumentalise the provisions of the Agriculture Bill and Environmental Land Management Scheme (ELMS) to both incentivise and enable the measurement of on-farm food waste and to incentivise the reduction of food surplus occurring in primary production.

As the UK transitions towards a post-Brexit agricultural policy, there is significant opportunity to use new food and farming policy to leverage food waste prevention, particularly on farms. Yet so far reducing agricultural food waste – and thus increasing productivity – has not been recognised as an important goal of farming policy. The Agriculture Bill currently contains a provision to allow for the creation of regulation to collect information about the agri-food supply chain, including for the purposes of minimising waste[98]. This provision should be leveraged to create regulation requiring the regular measurement of food waste occurring on farms (see box 3 for possible approaches), and to provide the resources necessary to do so. However, more broadly, the Agriculture Bill's failure to mention food waste – or other food policy issues – is a worrying omission. The government and devolved governments should take future opportunities to incorporate food waste reduction into food and farming policy, for example, in the government's response to the forthcoming National Food Strategy.

Another opportunity exists within the planned Productivity Grants[99], or the UK Shared Prosperity Fund, to enable primary producers to make best use of any surplus arising in production. Secondary markets are important for increasing the financial viability of smaller and mixed production farms, and productivity grants could be leveraged to allow farmers to invest in both supplying more local markets, thus lessening their dependency on single major buyers, or to develop processing facilities, in order to create value-added products such as juices, jams and sauces. Feedback recommends that grants or loans to increase on-farm productivity consider the reduction of food loss and waste as a key productivity goal.

Reducing food waste at farm-level is a unique opportunity to alleviate pressure on land, which often contributes to environmentally problematic farming methods, such as poor soil management in pursuit of higher short-term yields. ELMS should go beyond support for AD plants on individual farms to dispose of unavoidable farm wastes (with criteria to limit incorporation of purpose grown crops)[j], to incorporate the possibility of payments to support farmers to either measure food waste, or take action to prevent or mitigate it. More broadly, Feedback recommends that the government incorporates on-farm food waste reduction as an environmental public good within ELMS.

RECOMMENDATION 4: HARNESS MARKET FRAMEWORKS AND BUSINESS PRACTICE FOR FOOD WASTE PREVENTION

4.1. Ensure UK and overseas farmers can have recourse to the Groceries Code Adjudicator for waste incurred on their farms as a result of unfair trading practices

The diversity and resilience of UK food supply chains has come under profound pressure from the consolidation of groceries markets over the past thirty years. This pressure has been recognised by the Competition and Markets Authority, which has sought, over the years, to curb this tendency and deliver more diverse and fair groceries markets, particularly in highly concentrated local markets where shoppers face particularly limited choice[100]. More recently, the Competition and Markets Authority blocked a proposed merger between Sainsbury's and ASDA, two of the UK's four largest supermarket chains by market share[101].

Lack of choice is not only a problem for the public as shoppers, though this is the focus of the CMA's remit: concentration and consolidation of the groceries market leaves farmers and other primary producers in a weak bargaining position. The creation of the Groceries Code Adjudicator in 2013 was intended to ensure large retailers treat their direct suppliers lawfully and fairly, but indirect suppliers are excluded from the Adjudicator's remit[102]. This leaves suppliers to supermarkets through middlemen – largely smaller and overseas suppliers – in a particularly weak position. In a statutory review of the GCA published in July 2020, the government rejected the possibility of extending the GCA's remit, while acknowledging that there was still a need for a regulator[102].

In its 2019 survey of suppliers, the top issue experienced by 24% of suppliers in their relationship with retailers was 'incurring significant costs because of inaccurate forecasting by retailers'[103]. In this context, 'costs' refer to food (or other groceries supply chain goods) which was produced according to a retailer forecast, then later rejected as superfluous to requirements: in other words, food at significant risk of going to waste, unless a secondary market is found. Feedback has found evidence, both in the UK and overseas, that many farmers experience significant waste as a result of last minute order cancellations, cosmetic rejections and perverse incentives to overproduce[69,104].

j It is important to differentiate one-off development grants for AD plants used entirely for on-farm waste disposal, which supply power primarily for farm operations, from AD plants using long-term public subsidies to support their profitability, which risk distorting the food use hierarchy as described above, or driving the production of purpose-grown feed crops such as maize. See Feedback's report Bad Energy: Defining the true role of biogas in a net zero future, for more information[3].

Evidence of food waste, and other non-commercial impacts of unfair trading practices on the supply chain, are also excluded from the GCA's remit, and yet given the Adjudicator's position collecting evidence of the influence of supply chain power dynamics on producers, she or he is well-placed to look into this issue. Feedback recommends that the GCA's remit be extended to cover indirect as well as direct suppliers, who make up a significant proportion of the retailer supply chain[105]. The GCA should also be empowered to include 'food waste events' (such as the wastage of a certain proportion of a harvest or crop) among incidents that producers can report to the Adjudicator for further investigation, and to take food waste occurring on farms as one proxy for the occurrence of unfair practices.

4.2 Undertake a post-Covid review of the groceries supply chain to identify points of intervention to increase the diversity and resilience of supply chains and reduce waste

In July 2020 the Environment, Food and Rural Affairs (EFRA) committee published a review of the government's response to the impact of the Coronavirus pandemic on the groceries supply chain. They noted that the main government response to the crisis and the pressure it placed on grocery supplies was a relaxation of competition law, allowing greater collaboration between large retailers which may have had adverse effects on smaller players. It also noted that alongside disruptions to supply at food banks, considerable amounts of food were being wasted in the supply chain and recommended that Defra invest in trials supporting redistribution of food across the supply chain, including from farms[106]. This unprecedented period has exposed many of the structures of our food system, and revealed the extent to which major retailers dominate, and are permitted to dominate by active government policy decisions. While there is insufficient research into whether a lack of competition in the retail market contributes to endemic levels of food waste, there is a significant body of evidence demonstrating that consolidation of the retail market and subsequent power imbalances between retail buyers and suppliers does drive food waste[33,107].

It is therefore crucial that the government invest in research into the *causes* of food waste, particularly in the supply chain as opposed to households. This issue may need to be dealt with sensitively, possibly through anonymised reporting methods: even six years on from the creation of the GCA, 53% of suppliers surveyed said that they either wouldn't raise an issue with the GCA, or were not sure. Of this 53%, more than half said that the reason they would not raise an issue was because they believed 'the retailer will find out and there will be consequences for my business'[103]: a culture of fear in supply chain relationships is still very much an issue.

Sensitive investigation is therefore needed, and this could be conducted through the Groceries Code Adjudicator, or another similar body which is set up to conduct confidential interviews and has developed a position of trust with suppliers. Feedback recommends that the government commission a comprehensive post-Covid review of causes and drivers of food waste in supply chains, including recommendations for addressing these drivers and increasing the resilience of our supply chains.

RECOMMENDATION 5: PUT IN PLACE THE CONDITIONS FOR TRANSFORMATIVE CHANGE IN THE GROCERIES MARKET

While the measures above may help to curb food waste immediately, action to support a wider transformation of the food economy, which addresses the structural causes of food waste will be required in the longer-term to move towards a waste-free, circular food system.

> *"There is a chance for the government to treat this moment of crisis as an opportunity to reshape supply chains in ways that will be helpful in the long-term for supporting producers and reducing the environmental impacts of food production."*
> Feedback's response to the EFRA Committee Enquiry 'Covid-19 and food supply', quoted in The Guardian[108]

5.1 Enable greater citizen agency over their food

Food is valuable, but our food culture does not always support and enable us to see this. Food waste is a devaluation of food, and one response to this is to address the role of food in our culture. The 2020 National Food Strategy Part 1 argues that the UK's food culture is relatively impoverished, with UK citizens putting less social value on food and cooking than neighbouring countries[109].

In the shadow of coronavirus, having seen the incredible response of community groups and ordinary people around the country, frequently brought together by the urgent and practical need to get food to their friends and neighbours, the government and local governments face an opportunity to actively support and encourage the development of food citizenship in support of better health and the climate and environment. Food citizenship takes many forms, from preparing a meal for an elderly neighbour, to holding a retailer to account for the wages they pay their staff, or how they source their food. Feedback recommends that local authorities facilitate, in collaboration with local communities, the creation of local food policies, with links to local and national net zero targets. Mutual aid groups which were established during the spring 2020 coronavirus lockdown may be a route into better understanding local food attitudes and priorities.

National government must play its part, by not only funding the redistribution of existing surplus to people, but also nurturing a thriving culture of food citizenship, with funding for cookery classes and local food hubs[110], particularly in areas of greatest deprivation. Instead of prioritising pure redistribution of food surplus, Defra funding should provide seed funding for groups wishing to establish social enterprise or cooperative food models such as local growing, production or retail operations which enable better access to good food for all, while increasing the value of food in people's everyday lives.

Countering our 'wastogenic' environment involves more than technical fixes like rice measurers or checking our fridge temperature (though these things are needed too). It requires a deep internalisation of the value of food into the way we think about food, shop, cook and eat. A phenomenon similar to this seemed to occur during lockdown, with citizens, highly aware of the potential for food shortages, limiting their trips to the supermarket and taking more time to cook from scratch or explore uses for food they might normally have discarded[109]. As citizens, we saw our food differently, and our behaviour changed radically as a result. Feedback recommends that the National Food Strategy, and the government's response to it, includes steps to nurture both local and national food culture, and that this includes support and funding for a wide variety of food citizenship projects, from integration of food and environmental issues into the national curriculum (as is already being done to some degree through 'Citizenship' classes), to support for locally-run food hubs which can respond to the specific needs of the area in which they are based, given that the UK's food geographies vary drastically in terms of availability, access and socio-economic factors.

5.2 Support the shortening of supply chains and more regional food production and distribution

The IPCC has suggested that shorter supply chains may limit food waste generation – simply through a mechanism of fewer moments in food transport where waste can occur[10]. But a further way in which shorter supply chains may reduce waste may be through helping to 'rehumanise' food production, through for example, creating direct links between producers and citizens or increasing understanding of where food comes from. This in turn can help to foster citizens' agency, as described above, and help to produce a food environment where the value of food is more clearly appreciated, especially the land and labour required to produce it, helping to create an environment that is less likely to be 'wastogenic'.

One of the main ways in which policy makers can support the shortening of supply chain – or the de-facto regionalisation of food production and distribution – is through public procurement. Regionally, anchor institutions such as local authorities, universities, hospitals and prisons all have the potential to use their buying power to support regional production, supporting both local and regional

economies and jobs, and enhancing the strength of regional food systems, though this potential is so far largely poorly explored. Further study is needed to ascertain the extent to which these kinds of procurement practices reduce food waste, both on site, and within supply chains.

One example that the government could follow is to adopt a version of the French beneficial public procurement law, 'Egalim', which requires that public canteens use at least 50% organic, local or sustainably produced ingredients by January 2020[111]. Policy approaches like this have the potential to facilitate the support of local businesses: a case study from Avignon demonstrated how this law is being leveraged to support local businesses including an intermediary platform connecting public catering services and farmers, a small business which prepares local fresh vegetables and provides them to canteens ready to cook, and another small business which prepares soups and purees using local produce, allowing a response to over-supply of specific products during different seasons. Feedback further recommends that the government establish funding mechanisms which facilitate local groups to explore different models for shortening supply chains and enabling access to good food, such as collective purchasing of key essentials to reduce waste and increase access, as well as more familiar redistribution of retail surplus.

5.3 Support the regional use of surplus crops to support better food access

Feedback's Gleaning Network, and more recently independent community groups[112], have repurposed for charitable redistribution over 500 tonnes of farm-level food surplus since 2016. The potential of either charitable redistribution at farm-level, or creating secondary regional markets (explored further below), is largely under-recognised in the UK's response to food waste, in keeping with wider neglect of waste occurring in primary production. Feedback commends trials conducted between Defra and FareShare to neutralise the costs for farmers or growers to redistribute fresh surplus food[106], and recommends that Defra funding for food waste redistribution includes redistribution of non-supermarket surplus, such as farm-level surplus, and supports community networks which enable this, particularly regionally.

5.4 Support the diversification of the food sector, boosting the scale and reach of alternative business forms to displace the dominance of the supermarket

Finally, as discussed earlier in this report, addressing the root causes of food waste generation ultimately requires a move away from a groceries market dominated by supermarkets, to alternative business forms, forms in which there is not a commercial driver to generate waste, and in which food waste is not an inherent part of the way business is conducted.

A small study has shown that, when waste was measured at all stages of the system, a Community-Supported Agriculture (CSA) group wasted only 6.71% of salad and vegetable products by weight, compared with 40.7-47.7% for the supermarket system[113]. This included a lot less waste generated in homes, since there is no incentive for farmers to oversell to customers, the price for the share of the harvest having been agreed ahead of it. Customers' increased awareness of the value of their food, through their collective support to the producers of it, may have also played a part. Other forms of food procurement that may be less wasteful than supermarkets might include direct farmer to customer models, food preparation subscription models or consumer-owned cooperatives.

In the first instance, Feedback recommends further study is conducted on the links between business model, structure and food waste generation. Feedback also recommends that the government explores how to provide substantive and long-term support to the development of diverse routes to market for UK farmers, including supporting the development of community-owned or supported supply chains. While the potential to reduce food waste through these interventions is still poorly understood, one thing remains sure: food waste is inherent to the model and structure of today's supermarkets, and new approaches to food retail must therefore be piloted to reduce food waste and enable the shift to a more resilient, sustainable food system.

CONCLUSION

Food waste is endemic to our current food system and allowing this to continue poses a substantial barrier to achieving the UK's net zero climate targets. But it does not have to be so: there is good evidence that well-coordinated action, led by clear data and implemented consistently across businesses, the supply chain and households, can help the UK reduce our food waste by half – or even more – by 2030. Doing so will deliver both emissions savings, and help enable a healthier, less wasteful food culture. What is clear is that business as usual will not deliver these goals. It is not enough to encourage food businesses to do 'the right thing', or to accept pledges of actions which may or may not materialise in time. Given the pressing nature of our need to decarbonise, and the potential that addressing emissions from food waste offers to pave this path, action must now be regulation-led, and come from the top.

As the UK's food security strained under the pressures of coronavirus and the lockdown, the government turned to the market to save us. Now with a bigger crisis – the acceleration and impacts of climate change – looming large on our horizons, and even more at stake, it is time for government to step in. In the words of the Champions of SDG 12.3 on this year's inaugural International Food Loss and Waste Day: there's simply no more time – or food – to waste.

REFERENCES

1. Dave Lewis. Time to get serious about food waste in fight against global heating. (2020).
2. Styles, D., Yesufu, J., Bowman, M. & Luyckx, K. *Identifying the Sustainable Niche for Anaerobic Digestion in a Low Carbon Future*. (2020).
3. Bowman, M. & Woroniecka, K. *Bad Energy: Defining the true role of biogas in a net zero future*. https://feedbackglobal.org/wp-content/uploads/2020/09/Feedback-2020-Bad-Energy-report.pdf (2020).
4. de Ruiter, H., Macdiarmid, J. I., Matthews, R. B., Kastner, T. & Smith, P. Global cropland and greenhouse gas impacts of UK food supply are increasingly located overseas. *J. R. Soc. Interface* **13**, 20151001 (2016).
5. Flanagan, K., Robertson, K. & Hanson, C. *Reducing food loss and waste: Setting a Global Action Agenda*. https://files.wri.org/s3fs-public/reducing-food-loss-waste-global-action-agenda_1.pdf (2019).
6. Schulte, I. *et al. Enhancing NDCs for Food Systems: Recommendations for Decision-Makers*. https://wwfeu.awsassets.panda.org/downloads/wwf_ndc_food_final_low_res.pdf (2020).
7. Gustavsson, J., Cederberg, C., Sonesson, U., van Otterdijk, R. & Meybeck, A. *Global food losses and food waste: extent, causes and prevention*. http://www.fao.org/3/a-i2697e.pdf (2011).
8. Porter, S. D., Reay, D. S., Higgins, P. & Bomberg, E. A half-century of production-phase greenhouse gas emissions from food loss & waste in the global food supply chain. *Sci. Total Environ.* **571**, 721–729 (2016).
9. FAO. *Food Wastage Footprint: Impacts on natural resources – Summary report*. http://www.fao.org/3/i3347e/i3347e.pdf (2013).
10. IPCC. *Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems*. https://www.ipcc.ch/srccl/ (2019).
11. IPCC. *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*. https://www.ipcc.ch/sr15/ (2018).
12. Willett, W. *et al.* Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet* **393**, 447–492 (2019).
13. Springmann, M. *et al.* Options for keeping the food system within environmental limits. *Nature* **562**, 519–525 (2018).
14. Project Drawdown. Table of Solutions. *Project Drawdown* https://www.drawdown.org/solutions/table-of-solutions (2020).
15. WRAP. *Food surplus and waste in the UK – key facts (Updated January 2020)*. https://wrap.org.uk/sites/files/wrap/Food_%20surplus_and_waste_in_the_UK_key_facts_Jan_2020.pdf (2020).
16. Chapagain, A. & James, K. *The water and carbon footprint of household food and drink waste in the UK*. https://www.wrap.org.uk/sites/files/wrap/Water%20and%20Carbon%20Footprint%20report%20Final,%20Nov%202011_0.pdf (2011).
17. Defra. Food Statistics in your pocket: Global and UK supply. *GOV.UK* https://www.gov.uk/government/publications/food-statistics-pocketbook/food-statistics-in-your-pocket-global-and-uk-supply (2020).
18. Godfray, H. C. J. *et al.* Meat consumption, health, and the environment. *Science* **361**, eaam5324 (2018).
19. Committee on Climate Change. *Land Use: Policies for a Net Zero UK*. https://www.theccc.org.uk/wp-content/uploads/2020/01/Land-use-Policies-for-a-Net-Zero-UK.pdf (2020).
20. WWF-UK & RSPB. *Riskier business: The UK's overseas land footprint*. https://www.wwf.org.uk/sites/default/files/2020-07/RiskierBusiness_July2020_V7_0.pdf (2020).
21. WRAP. *Meat in a net zero world: Optimising productivity and minimising waste from farm to fork*. https://wrap.org.uk/sites/files/wrap/Meat_in_a_Net_Zero_world_publication_0.pdf (2020).
22. Sinclair Taylor, J. Less is better – responding to 'Meat in a Net Zero World'. *Feedback* https://feedbackglobal.org/less-is-better-responding-to-meat-in-a-net-zero-world/ (2020).
23. Champions 12.3. *Call to global action on food loss and waste*. (2020).
24. WRAP. Love Food Hate Waste | WRAP UK. https://wrap.org.uk/content/love-food-hate-waste (2015).
25. HM Government. *Our waste, our resources: a strategy for England*. 146 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf (2018).
26. FAO. 12.3.1 Global food losses | Sustainable Development Goals | Food and Agriculture Organization of the United Nations. http://www.fao.org/sustainable-development-goals/indicators/1231/en/ (2015).
27. WRAP. Food Waste Reduction Roadmap | WRAP UK. *WRAP UK* https://wrap.org.uk/food-waste-reduction-roadmap (2017).
28. Messenger, S. 'Ambitious' target to halve food waste in Wales by 2025. *BBC News* (2017).
29. Gove appoints Food Waste Champion. *GOV.UK* https://www.gov.uk/government/news/gove-appoints-food-waste-champion (2018).
30. WRAP. *Food surplus and waste in the UK – key facts (Updated January 2020)*. https://wrap.org.uk/sites/files/wrap/Food_%20surplus_and_waste_in_the_UK_key_facts_Jan_2020.pdf (2020).
31. BEIS. *2018 UK Greenhouse Gas Emissions, Final figures*. 41 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/862887/2018_Final_greenhouse_gas_emissions_statistical_release.pdf (2020).
32. Tesco PLC. *Tesco and Society Report 2014*. https://www.tescoplc.com/media/754709/tesco_and_society_review_2014.pdf (2014).
33. Bowman, M. *Farmers talk food waste: Supermarkets role in crop waste on UK farms*. https://feedbackglobal.org/wp-content/uploads/2018/08/Farm_waste_report_.pdf (2018).
34. Smithers, R. UK throwing away £13bn of food each year, latest figures show. *The Guardian* (2017).
35. WRAP. *UK progress against Courtauld 2025 targets and UN Sustainable Development Goal 12.3*. https://wrap.org.uk/sites/files/wrap/Progress_against_Courtauld_2025_targets_and_UN_SDG_123.pdf (2020).

36. Roberts, M. & Downing, P. *Citizen responses to the Covid-19 lockdown – food purchasing, management and waste*. https://wrap.org.uk/sites/files/wrap/Citizen_responses_to_the_Covid-19_lockdown_0.pdf (2020).

37. Smithers, R. Food waste increases in UK as coronavirus restrictions ease. *The Guardian* (2020).

38. Koehler, D. A. The Effectiveness of Voluntary Environmental Programs—A Policy at a Crossroads? *Policy Stud. J.* **35**, 689–722 (2007).

39. MSI Integrity. *Not Fit-for-Purpose: The Grand Experiment of Multi-Stakeholder Initiatives in Corporate Accountability, Human Rights and Global Governance*. https://www.msi-integrity.org/not-fit-for-purpose/ (2020).

40. National Farmers Union. Tesco commits to reducing food waste. *NFU Online* https://www.nfuonline.com/sectors/food-chain/food-chain-news/tesco-commits-to-reducing-food-waste/ (2013).

41. Butler, S. Rivals to follow Tesco in revealing amount of food wasted. *The Guardian* (2014).

42. edie.net. Supermarket food waste: Combined figures revealed for first time. *edie.net* https://www.edie.net/news/5/Supermarket-food-waste--Combined-figures-revealed-for-first-time/ (2015).

43. Quinn, I. Tesco convinces suppliers to publish food waste data. *The Grocer* (2017).

44. Quinn, I. Tesco suppliers reveal food waste figures of 700,000 tonnes. *The Grocer* (2018).

45. Quinn, I. Why aren't more firms being transparent over food waste? *The Grocer* (2019).

46. WRAP & IGD. *Food Waste Reduction Roadmap: Progress Report 2020*. https://wrap.org.uk/sites/files/wrap/Food-Waste-Reduction-Roadmap-Progress-Report-2020_0.pdf (2020).

47. WRAP. *UK food waste – Historical changes and how amounts might be influenced in the future*. 10 http://www.wrap.org.uk/sites/files/wrap/UK%20food%20waste%20-%20Historical%20and%20future%20changes%20(FINAL)_0.pdf (2014).

48. WRAP. WRAP restates UK food waste figures to support united global action. *WRAP* https://wrap.org.uk/content/wrap-restates-uk-food-waste-figures-support-united-global-action (2018).

49. WRAP. The Courtauld Commitment 2025 to transform UK food and drink. *WRAP* https://wrap.org.uk/content/courtauld-commitment-2025-transform-uk-food-and-drink (2016).

50. Hanson, C. *Guidance on Interpreting Sustainable Development Goal Target 12.3*. https://champs123blog.files.wordpress.com/2017/10/champions-12-3-guidance-on-interpreting-sdg-target-12-3.pdf (2017).

51. Poulter, S. Supermarkets under fire for failing to drop Buy One Get One Free deals. *Mail Online* http://www.dailymail.co.uk/~/article-4134514/index.html (2017).

52. Wells, L. Supermarket visits return to pre-lockdown levels. https://www.talkingretail.com/news/industry-news/supermarket-visits-return-to-pre-lockdown-levels-19-08-2020/ (2020).

53. WRAP. *Household food and drink waste: A product focus*. https://wrap.org.uk/sites/files/wrap/Product-focused%20report%20v5_3.pdf (2014).

54. WRAP. *Helping Consumers Reduce Food Waste – Retail Survey 2015*. https://www.wrap.org.uk/sites/files/wrap/Retail_Survey_2015_Summary_Report_0.pdf (2017).

55. WRAP. Extending product life – summary of opportunities for action and review. https://wrap.org.uk/sites/files/wrap/FINAL%20Product%20life%20%20summary%20opportunities%20point%204.pdf (2015).

56. Egger, G. & Swinburn, B. An 'ecological' approach to the obesity pandemic. *BMJ* **315**, 477–480 (1997).

57. Defra. Defra food waste initiatives bear fruit. *GOV.UK* https://www.gov.uk/government/news/defra-food-waste-initiatives-bear-fruit (2020).

58. Defra. Food and drink waste hierarchy: deal with surplus and waste. *GOV.UK* https://www.gov.uk/government/publications/food-and-drink-waste-hierarchy-deal-with-surplus-and-waste/food-and-drink-waste-hierarchy-deal-with-surplus-and-waste (2018).

59. Defra. Food Waste Fund: £4 million awarded to cut food waste. *GOV.UK* https://www.gov.uk/government/news/food-waste-fund-4-million-awarded-to-cut-food-waste (2019).

60. Burgos, S., Colin, F., Graf, V. & Mahon, P. *Voluntary Agreements as a collaborative solution for food waste reduction*. https://eu-refresh.org/sites/default/files/REFRESH%20Policy%20Brief%20on%20VAs_2019_FINAL.pdf (2019).

61. Tesco PLC. UK will miss SDG on food waste unless mandatory reporting is introduced. *Tesco PLC* /news/2019/uk-will-miss-sdg-on-food-waste-unless-mandatory-reporting-is-introduced/ (2019).

62. Cole, R. Sainsbury's drops food waste reduction campaign. *Resource Magazine* (2018).

63. House of Lords EU Committee. *Counting the Cost of Food Waste: EU Food Waste Prevention*. 78 https://publications.parliament.uk/pa/ld201314/ldselect/ldeucom/154/15402.htm (2013).

64. Butler, S. Tesco beats forecast with 28% rise in annual profits. *The Guardian* (2018).

65. Smithers, R. Tesco to work with sharing app Olio in bid to drive down food waste. *The Guardian* (2020).

66. WRAP. Citizen Food Waste Behaviour Change Grant | WRAP UK. *WRAP UK* https://wrap.org.uk/content/citizen-food-waste-behaviour-change-grant (2020).

67. Grocery Market Share – Kantar. *Kantar World Panel* https://www.kantarworldpanel.com/en/grocery-market-share/great-britain (2020).

68. Sinclair Taylor, J., Parfitt, J. & Jarosz, D. *Regulating the role of Unfair Trading Practices in food waste generation*. https://eu-refresh.org/regulating-role-unfair-trading-practices-food-waste-generation (2019).

69. Colbert, E. *Causes of food waste in international supply chains*. https://feedbackglobal.org/wp-content/uploads/2017/05/Causes-of-food-waste-in-international-supply-chains_Feedback.pdf (2017).

70. Feedback. Farmers talk food waste: supermarkets' role in crop waste on UK farms. (2018).

71. Tesco PLC. Tesco and suppliers cut 200,000 tonnes of food waste from operations. *Tesco PLC* /news/2020/tesco-and-suppliers-cut-200-000-tonnes-of-food-waste-from-operations/ (2020).

72. WRAP. *Household food waste: restated data for 2007-2015*. 104 https://www.wrap.org.uk/sites/files/wrap/Household%20food%20waste%20restated%20data%202007-2015.pdf (2018).

73. WRAP. Econometric modelling and household food waste. (2014).

74. Tesco PLC. *Annual Report and Financial Statements 2015*. https://www.tescoplc.com/media/1426/tescoar15.pdf (2015).

75. Statista. Great Britain: Grocery market share 2015-2020. *Statista* https://www.statista.com/statistics/280208/grocery-market-share-in-the-united-kingdom-uk/ (2020).

76. Climate Assembly UK. *The path to net zero*. https://climateassembly.uk/report/read/ (2020).

77. Doherty, J. Food waste 'boost' to Northern Ireland's recycling rate. *Lets Recycle* (2018).

78. Stewart, B., Shepherd, C., Bellwood-Howard, I. & Bowman, M. *Counting What Matters: The Report of the Industry Food Waste Audit Proposal*. https://www.thisisrubbish.org.uk/wp-content/uploads/2017/11/Counting-What-Matters.pdf (2013).

79. Johnson, L. K. *et al.* Estimating on-farm food loss at the field level: A methodology and applied case study on a North Carolina farm. *Resour. Conserv. Recycl.* **137**, 243–250 (2018).

80. *Food losses and waste in primary production: Case studies on carrots, onions, peas, cereals and farmed fish*. (Nordic Council of Ministers, 2017).

81. Segrè, A. & Falasconi, L. Il libro nero dello spreco in Italia: il cibo. http://freebook.edizioniambiente.it/libro/69/Il_libro_nero_dello_spreco_in_Italia_il_cibo (2011).

82. ADEME. *Pertes et gaspillages alimentaires : l'état des lieux et leur gestion par étapes de la chaîne alimentaire*. 16 https://www.ademe.fr/sites/default/files/assets/documents/pertes-gaspillages-alimentaires-etat-lieux-201605-synt.pdf (2016).

83. Roels, K. *The impact of cosmetic quality standards on food losses in the Flemish fruit and vegetable sector*. 13 http://www.refreshcoe.eu/wp-content/uploads/2017/06/Impact-of-cosmetic-standards-on-food-losses.pdf (2017).

84. WRAP & LEAF. *Food Waste Matters*. https://s3-eu-west-1.amazonaws.com/leaf-website/Food-Waste-Matters-18.pdf (2018).

85. WRAP. *Food waste in primary production – a preliminary study on strawberries and lettuces*. https://wrap.org.uk/sites/files/wrap/Food_waste_in_primary_production_report.pdf (2017).

86. Gerten, D. *et al.* Feeding ten billion people is possible within four terrestrial planetary boundaries. *Nat. Sustain.* 1–9 (2020) doi:10.1038/s41893-019-0465-1.

87. Reece, A. Defra cuts WRAP funding. *Resource Magazine* https://resource.co/article/UK/Defra_cuts_WRAP_funding-3262 (2013).

88. Murray, J. WRAP facing up to 25 job losses following cuts to government funding. *http://www.businessgreen.com* https://www.businessgreen.com/bg/news/3024593/wrap-facing-up-to-25-job-losses-following-cuts-to-government-funding (2018).

89. Hayrapetyan, H., Nierop Groot, M. & Zwietering, M. H. *Literature search for heat and acid inactivation parameters of viruses relevant for food waste treatment for recycling to pig feed*. (2019).

90. Luyckx, K. *REFRESH Task 6.3.3 Expert seminar on the risk management of using treated surplus food in pig feed*. http://eu-refresh.org/sites/default/files/REFRESH%20animal%20feed%20expert%20seminar%20report%20final%2012.04.18.pdf (2018).

91. Luyckx, K., Bowman, M., Broeze, J., Taillard, D. & Woroniecka, K. *Technical guidelines animal feed: The safety, environmental and economic aspects of feeding treated surplus food to omnivorous livestock. REFRESH Deliverable 6.7.* https://eu-refresh.org/technical-guidelines-animal-feed (2019).

92. Luyckx, K. & Bowman, M. *Feeding Surplus Food to Pigs Safely: A win-win for farmers and the environment*. https://feedbackglobal.org/wp/wp-content/uploads/2018/07/Pig-Idea-UK-policy-report.pdf (2018).

93. Defra. *Waste Management Plan for England*. https://consult.defra.gov.uk/waste-and-recycling/waste-management-plan-for-england/supporting_documents/Waste%20Management%20Plan%20for%20England.pdf (2020).

94. United Kingdom Without Incineration Network. *Evaluation of the climate change impacts of waste incineration in the United Kingdom*. https://ukwin.org.uk/files/pdf/UKWIN-2018-Incineration-Climate-Change-Report.pdf (2019).

95. Benson, I. MPs call for incineration tax in Commons debate. *Resource Magazine* https://resource.co/article/mps-call-incineration-tax-commons-debate (2020).

96. HM Treasury. Strong public backing bolsters fight against blight of plastic waste. *GOV.UK* https://www.gov.uk/government/news/strong-public-backing-bolsters-fight-against-blight-of-plastic-waste (2018).

97. Environment, Food and Rural Affairs Committee. *Oral Evidence: The Work of Defra's Chief Scientific Advisor, HC 775*. http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/environment-food-and-rural-affairs-committee/work-of-the-chief-scientific-adviser-defra/oral/78127.pdf (2018).

98. Department for Environment, Food and Rural Affairs. *Agriculture Bill*. (2019).

99. Defra. New details of the flagship Environmental Land Management scheme unveiled by Environment Secretary – Defra in the media. *GOV.UK* https://deframedia.blog.gov.uk/2020/02/25/new-details-of-the-flagship-environmental-land-management-scheme-unveiled-by-environment-secretary/ (2020).

100. Competition Commission. New release: Groceries Market Investigation – Final Report. (2008).

101. Competition and Markets Authority. CMA blocks merger between Sainsbury's and Asda. *GOV.UK* https://www.gov.uk/government/news/cma-blocks-merger-between-sainsburys-and-asda (2019).

102. Department for Business, Energy and Industrial Strategy. *Statutory Review of the Groceries Code Adjudicator: 2016-2019*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/901016/gca-report.pdf (2020).

103. Groceries Code Adjudicator. 2019 GCA Conference - Speaker presentations. https://www.gov.uk/government/news/2019-gca-conference-speaker-presentations (2019).

104. Bowman, M. *Farmers Talk Food Waste*. https://feedbackglobal.org/wp/wp-content/uploads/2018/02/Farm_waste_report_.pdf (2018).

105. Traidcraft, S. Discussion Document: Changes to the Groceries Code Adjudicator. (2017).

106. Environment, Food and Rural Affairs Committee. *COVID-19 and food supply: First Report of Session 2019-21*. https://committees.parliament.uk/publications/2187/documents/20156/default/ (2020).

107. Wunder, S. *et al. Food waste prevention and valorisation: relevant EU policy areas. Report of the REFRESH Project, D3.3 Review of EU policy areas with relevant impact on food waste prevention and valorization.* (2018).

108. Laville, S. Coronavirus offers chance to create fairer UK food supply chain, say experts. *Guardian* (2020).

109. Dimbleby, H. *National Food Strategy Part One*. https://www.nationalfoodstrategy.org/wp-content/uploads/2020/07/NFS-Part-One-SP-CP.pdf (2020).

110. Hubbub. *Greenprint for a better Britain*. https://issuu.com/hubbubuk/docs/greenprint_3/1 (2020).

111. Ministère de l'Agriculture et de l'Alimentation. #EGalim : ce que contient la loi Agriculture et Alimentation. https://agriculture.gouv.fr/egalim-ce-que-contient-la-loi-agriculture-et-alimentation (2019).

112. Feedback. Gleaning Network - Fighting Food Waste Across the UK. *Gleaning Network* https://gleaning.feedbackglobal.org/ (2019).

113. Baker, N., Popay, S., Bennett, J. & Kneafsey, M. Net Yield Efficiency: Comparing Salad and Vegetable Waste between Community Supported Agriculture and Supermarkets in the UK. *J. Agric. Food Syst. Community Dev.* **8**, 179–192 (2019).

114. House of Commons EFRA Committee. Food waste in England: Eighth Report of Session 2016–17. House of Commons Environment, Food and Rural Affairs Committee, p. 42. Available at: https://publications.parliament.uk/pa/cm201617/cmselect/cmenvfru/429/429.pdf (2017).

From 2025 we are

FOODRISE

This document uses our old branding

Feedback regenerates nature by transforming the food system. To do this we challenge power, catalyse action and empower people to achieve positive change.

Published October 2020

Authors: Jessica Sinclair Taylor, Martin Bowman, Carina Millstone and Christina O'Sullivan

Design: Garth Stewart and Noble Studios

Cover image credit: Sun_Shine / Shutterstock.com

Citation: Feedback. 2020. Where there's no waste, there's a way (to net zero): a call for policy for food waste prevention. London: Feedback.

www.feedbackglobal.org
@feedbackorg

Registered in England and Wales,
charity number 1155064

FEEDBACK

FEEDING PEOPLE, BACKING THE PLANET