

# Household Food and Drink Waste in the United Kingdom 2012



This report provides estimates of the amount of food and drink waste generated by UK households in 2012. It includes details of the types of food and drink wasted, why it is thrown away, and where the material goes. It updates WRAP's 2007 estimates of household food and drink waste.

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**Front cover photography:** Leftover food (WRAP)

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# Summary of Household Food and Drink Waste in the United Kingdom 2012

## Why was this work undertaken?

Food has a central role in our lives, and food production and retail plays a key role in our economy. However, ground-breaking research published by WRAP revealed that in 2007 a staggering amount of the food and drink brought into the home was being thrown away (8.3 million tonnes, 22% of purchases). Wasting food and drink hits our pockets – spending money on food that ends up being thrown away – and is a financial drain on local authorities who have to pay for food waste collection and treatment. It has a detrimental impact on the environment, wasting the materials, water and energy used in its production. Reducing the amount of food and drink thrown away can help alleviate all of these, and contribute to a more resilient UK economy and food system.

Most of us don't want to waste food, and WRAP launched the Love Food Hate Waste (LFHW; [www.lovefoodhatewaste.com](http://www.lovefoodhatewaste.com)) campaign in 2007 to help deliver practical ways to reduce food waste. We also expanded an agreement with the food industry (the Courtauld Commitment<sup>1</sup>) to help consumers make more of the food and drink they buy, and throw less away. Our evidence on the amounts and types of food and drink wasted, and why it was thrown away, was critical to raising awareness of the issue and encouraging people to make changes that lead to less food and drink being wasted. This evidence enabled the wide range of organisations who have worked with WRAP on this important issue to target effort where it can deliver the greatest benefit.

Since that work in 2007, tackling food and drink waste has received much attention around the world: Governments, international agencies, businesses, local authorities, community groups and many others have worked with consumers to change the way we use food. Major retailers, food brands and other manufacturers have helped through innovations in products, packaging and labelling. In 2011, WRAP carried out research, funded by UK Governments, that revealed that household food and drink waste levels had reduced considerably since 2007<sup>2</sup>. However, additional in-depth research, updating the work done in 2007, was needed to identify the detail of what had changed.

This new report contains some remarkable findings. It reveals that the amount of food and drink thrown away that could have been eaten fell by 21% between 2007 and 2012. However, it also shows the sheer scale of the food and drink still being wasted in UK households – 4.2 million tonnes of avoidable food and drink is wasted each year, worth £12.5 billion.

The report offers detailed information about food and drink wasted in 2012. For example, just under half of avoidable food and drink waste (worth £5.6 billion) was classified as 'not used in time': thrown away because it had either gone off or passed the date on the packaging. This included large amounts of bread, milk and potatoes. This underlines that

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<sup>1</sup> <http://www.wrap.org.uk/content/what-is-courtauld>

<sup>2</sup> <http://www.wrap.org.uk/content/new-estimates-household-food-and-drink-waste-uk>

despite terrific efforts across the board we have not cracked the problem, with much of this essential and valuable resource still being wasted.

The findings, from research funded by UK Governments, are based on three sources of data: detailed measurement of the weight and types of food and drink waste from approximately 1,800 consenting households, a week-long food and drink diary involving 950 households and a synthesis of waste data from more than 80 local authorities.

This updated detailed evidence base will allow Governments, WRAP and its partners to make strategic decisions regarding the prevention of household food and drink waste. It will enable us to refresh and target the approaches and materials aimed at delivering this – bringing benefits to individuals, communities, businesses and the UK as a whole. In addition, information on food waste disposal routes, and in particular the amounts and types of food in the 'general' bin and separately collected, will be valuable to local authorities who are looking at delivering efficient services.

The database sitting behind this report is extensive. Additional analysis is being undertaken to understand the full implications of this research and will be reported in spring 2014. This includes developing a better understanding of the food and drink waste from different types of household, and what influences this. This will help develop and target more tailored messages, guidance and solutions for different groups of people.

Food waste in the home is not the only source of food waste, but WRAP's work shows it makes the single largest contribution; around 50% of the total across all sectors in the UK. There are benefits to reducing food waste wherever it arises, and WRAP is also working with grocery and hospitality and food service businesses to reduce food waste<sup>3</sup>.

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<sup>3</sup> <http://www.wrap.org.uk/category/what-we-offer/voluntary-agreements> and [www.wrap.org.uk/food](http://www.wrap.org.uk/food)

## Key facts – what has changed between 2007 and 2012?

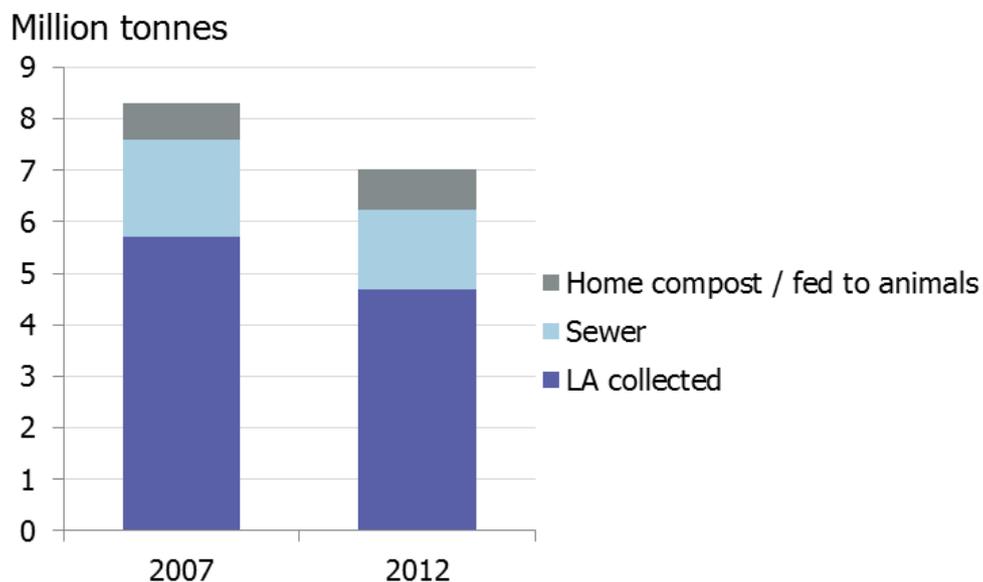
### How much did we waste overall? (see Figure A)

There was a reduction of 1.3 million tonnes of household food and drink waste between 2007 and 2012, from 8.3 million tonnes to 7.0 million tonnes. This is a 15% reduction, despite an increase of 4% in the number of households in the UK. The waste prevented would have filled 2,600 Olympic swimming pools.

When expressed per household, the total amount of food and drink waste reduced by 19% over this time period, from 320 kg to 260 kg per household per year – this reduction of 60 kg is more than sufficient to fill a wheelie bin.

The decrease in food and drink waste is particularly evident in the waste collected by local authorities: an 18% reduction from 5.7 million tonnes in 2007<sup>4</sup> to 4.7 million tonnes in 2012.

**Figure A:** Comparison of weight of household food and drink waste arisings in the UK between 2007 and 2012, split by disposal route



<sup>4</sup> This figure has been slightly restated since *Household Food and Drink Waste in the UK* (published in 2009) to ensure comparability with current research. The original figure was 5.8 million tonnes. See Chapter 4.0 of the main report for more details.

## Reductions in avoidable food waste, and the benefits (see Figure B)

Of the 1.3 million tonne reduction, 1.1 million tonnes was food and drink that could have been eaten (avoidable<sup>5</sup>), a 21% reduction from 5.3 million tonnes in 2007 to 4.2 million tonnes in 2012. This reduction is enough to completely fill Wembley Stadium.

When expressed per household, the amount of avoidable food and drink waste reduced by almost a quarter (24%), from 210 kg to 160 kg per household per year. This equates to a reduction of 1 kg per week for the average household.

This large reduction in avoidable food and drink waste was concentrated in five categories, each with reductions of more than 100,000 tonnes: home-made and pre-prepared meals, bakery, drink, fresh fruit, and dairy and eggs. For other categories, there were either smaller reductions (such as in fresh vegetables and salad) or very little change (such as for meat and fish).

This reduction is reflected in the equivalent number of items thrown away per day in the UK for 2007 and 2012:

- Bananas have reduced: from 1.7 million to 1.4 million wasted per day.
- Tomatoes: from 2.0 million to 1.5 million.
- Yoghurts: from 1.7 million to 1.2 million.
- Home-made meals: from 1.8 million to 1.5 million.
- Bread: from 37 million slices to 24 million slices.

The avoidable food and drink waste that was subsequently thrown away would have cost £12.5 billion across the UK, or £470 per household per year, at 2012 food prices.

If the amount of avoidable food and drink waste had remained at 2007 levels, this would have cost £15.8 billion to purchase at 2012 food prices. Therefore, the reduction in food and drink waste between 2007 and 2012 saved UK households £3.3 billion in 2012 alone – that's around £130 for the average household.

The reduction in food waste in our bins<sup>6</sup> will have saved local authorities around £85 million in avoided landfill tax and gate fees in 2012 alone.

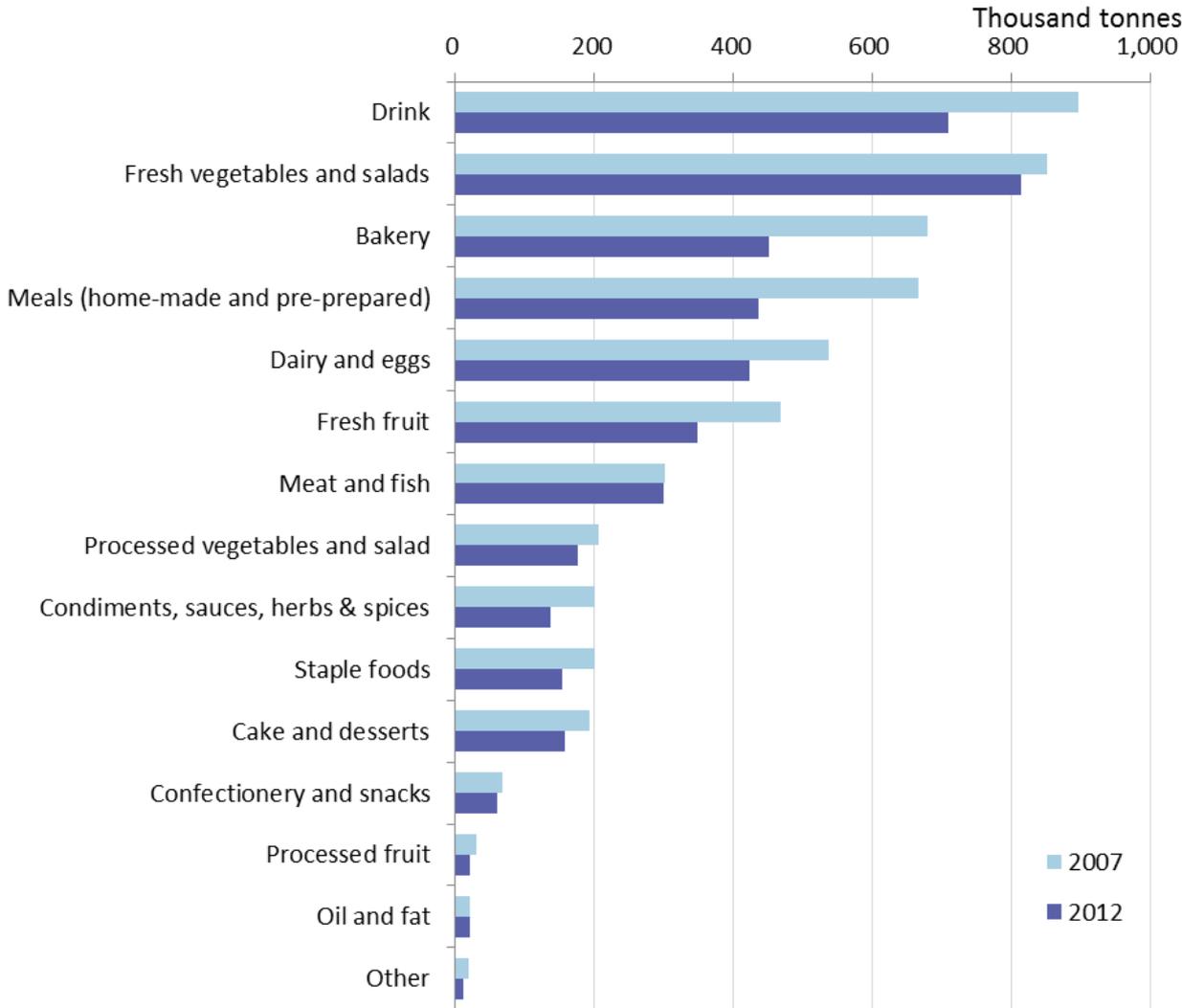
The savings in greenhouse gas emissions associated with the reductions in avoidable food and drink waste amounted to 4.4 million tonnes of CO<sub>2</sub> equivalents; the same as would be saved from taking 1.8 million cars off UK roads.

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<sup>5</sup> See section 1.2.2 of the main report for definitions of the different fractions of food waste

<sup>6</sup> This refers to 'residual' or general bins, not those aimed at collecting food waste separately.

**Figure B:** Comparison of avoidable household food and drink waste between 2007 and 2012 split by food group



## **Key facts – household food waste in 2012: breakdown and implications**

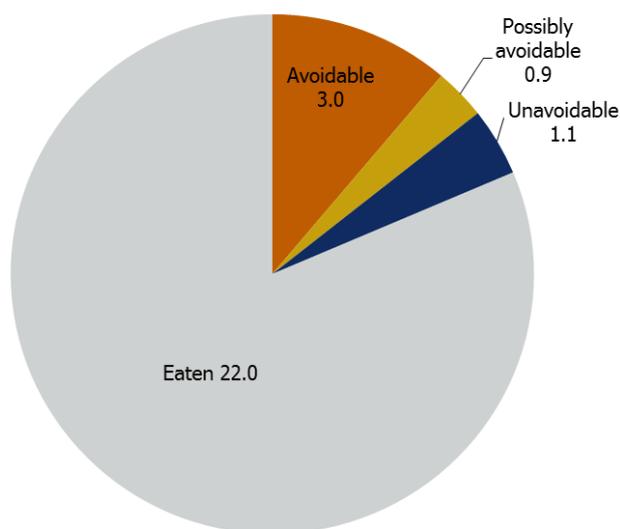
### **Overall amounts thrown away (see Figure C)**

The 7.0 million tonnes of food and drink waste thrown away from our homes in 2012 is enough to fill Wembley Stadium nine times over<sup>7</sup>. It represents 19%, by weight, of food and drink brought into the home, compared to 22% in 2007. Of this total:

- 4.2 million tonnes (or 60% of the total) is avoidable, worth £12.5 billion; the comparable figures in 2007 were 5.3 million tonnes, or 64% of the total. This avoidable waste is food and drink that would have been edible at some point prior to being thrown away, for example slices of bread, apples, yoghurts etc. This is equivalent to the average household throwing away six meals per week, down from 8 meals per week in 2007. This 4.2 million tonnes is the equivalent of 12% of the weight of edible food and drink brought into the home.
- 1.2 million tonnes (17% of the total) was considered 'possibly avoidable' (1.4 million tonnes in 2007<sup>8</sup>). This includes things like bread crusts and potato peelings that some people eat but others do not.
- 1.6 million tonnes (23% of the total) was unavoidable waste (1.5 million tonnes in 2007). Five types of waste made up 60% of this (tea waste, banana skins, poultry bones, onion skins and orange peel).

The average household of 2.4 people purchased around 27 kg of food and drink per week in 2011<sup>9</sup>. 19% of this was not consumed.

**Figure C:** Weight of food and drink waste per household – by avoidability – in comparison to a weekly shop



*Figures give amount of food purchases and waste in kg per household per week*

<sup>7</sup> This and other 'equivalents' have been calculated by WRAP as described in Appendix 4 of the main report.

<sup>8</sup> This figure has been slightly restated since *Household Food and Drink Waste in the UK* to ensure comparability with current research, and was previously reported as 1.5 million tonnes. See Chapter 4.0 of the main report for more details.

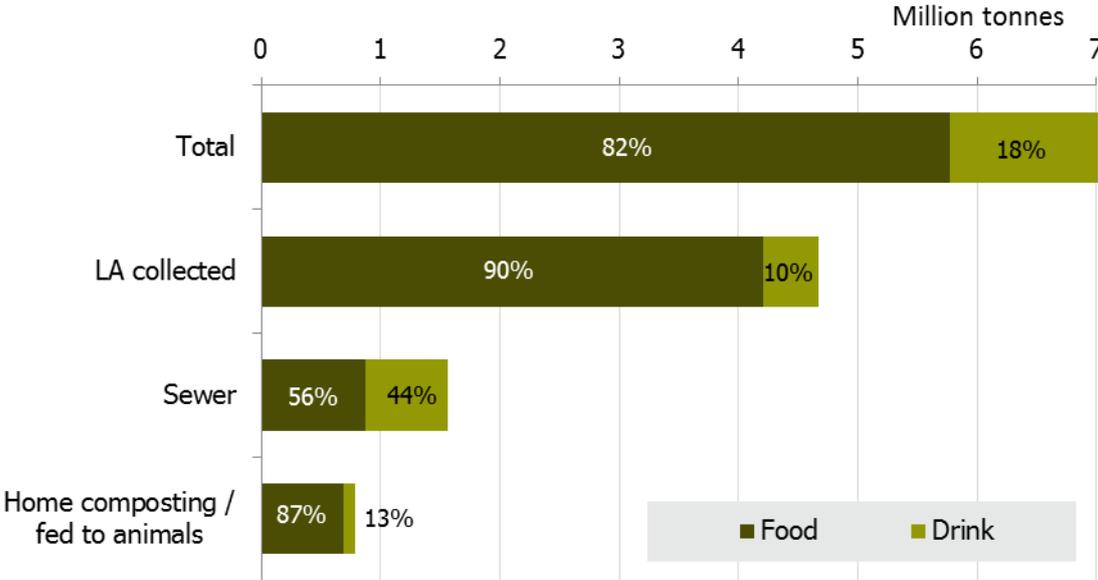
<sup>9</sup> The 2012 Family Food Survey was not published at the time of writing this report.

**Where the food and drink waste goes (see Figure D)**

Two thirds (4.7 million tonnes) of household food and drink waste was collected by local authorities in 2012. Of this, most was collected in kerbside ‘residual’ or general waste, although more than half a million tonnes (around 11% of that collected) was in targeted collections of food waste, meaning it could be treated to generate energy and useful digestate or compost<sup>10</sup>.

Around a fifth was disposed of via the sewer (1.6 million tonnes; the kitchen sink and other drains), with drinks and dairy products making up more than half of this. The remainder was either composted at home (0.51 million tonnes) or fed to animals (0.28 million tonnes).

**Figure D:** Weight of household waste in 2012 by disposal route, split by food and drink



**What it costs us**

For the average household, the price of the avoidable food and drink waste was around £9 per week, equivalent to £470 per year. This compares to an average weekly food and drink expenditure of £66 per household per week in 2011<sup>11</sup>. Therefore, avoidable food and drink waste accounted for approximately 14% of the shopping budget.

The higher the number of people in a household, the greater the amount of food waste generated, although the increase was not proportional, i.e. an average four-person household wastes less than four times the average single-occupancy household.

The cost of wasting food and drink, therefore, increased with household size, and is £700 per year (almost £60 a month) for the average household with children. This relationship – that households with more people in them find themselves wasting more food and drink – held, irrespective of whether the people in the household were adults or children (i.e. in

<sup>10</sup> For more details, please see Synthesis of Food Waste Compositional Data 2012 (§4.1).

<sup>11</sup> The 2012 Family Food Survey was not published at the time of writing this report.

terms of overall amounts of food thrown away there was no significant difference between adults and children).

One-person households threw away, on average, over 40% more avoidable food and drink waste than the overall amount per person in the UK, worth £290 a year compared to the UK average of £200 per person.

### Types of avoidable food waste (see Figures E and F)

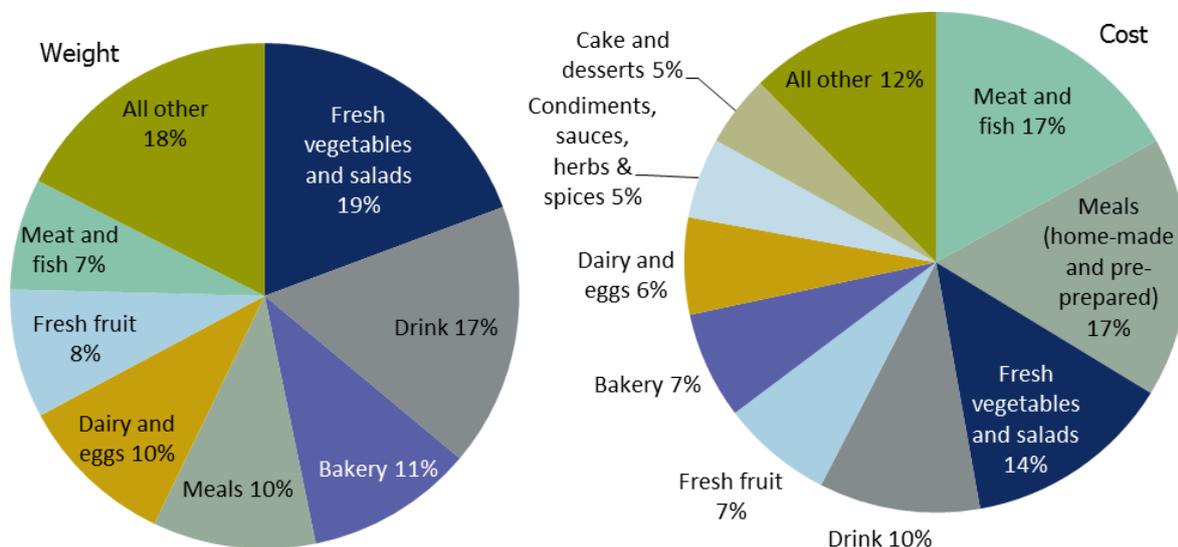
By weight, the largest contributions to avoidable food waste were from:

- Fresh vegetables and salads (19%; 810,000 tonnes).
- Drink (17%; 710,000 tonnes).
- Bakery (11%; 450,000 tonnes).
- Home-made and pre-prepared meals (10%; 440,000 tonnes).
- Dairy and eggs (10%; 420,000 tonnes).

By cost, the largest food groups wasted were:

- Meat and fish (17%; £2.1 billion).
- Home-made and pre-prepared meals (17%; £2.1 billion).
- Fresh vegetables and salad (14%; £1.7 billion).
- Drink (10%; £1.3 billion).
- Fresh fruit (7%; £900 million).

**Figure E:** Proportions of avoidable food and drink waste by food group: weight (left) and cost (right)



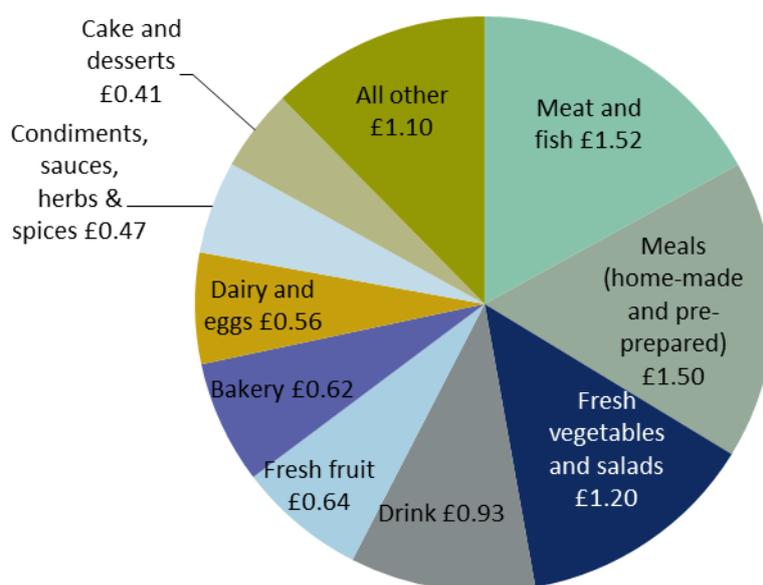
- Fresh fruit, vegetable and salads combined, amounted to 1.2 million tonnes, worth £2.6 billion.
- More than 13 billion '5 a day' portions of fruit and vegetables were thrown away in 2012<sup>12</sup>, enough to provide more than 7 million people with their '5 a day' for a year.

<sup>12</sup> As per the accepted definition of what contributes to '5 a day', fresh fruit and vegetables are included (except for potatoes) alongside processed fruit, vegetables fruit juices and smoothies.

The top ten food types thrown away within the avoidable food waste were, by weight:

1. Standard bread
2. Fresh potatoes
3. Milk
4. Meals (home-made and pre-prepared)
5. Carbonated soft drinks
6. Fruit juice and smoothies
7. Poultry meat
8. Pork meat
9. Cakes
10. Processed potatoes (e.g. chips)

**Figure F:** Cost of avoidable food and drink waste per household per week, by food group



*Figures give waste in £ per household per week*

## Environmental impact

The greenhouse gas emissions associated with avoidable food and drink waste from UK homes accounted for approximately 17 million tonnes of CO<sub>2</sub> equivalent. The carbon saving of preventing all avoidable food waste in 2012 is equivalent to taking one in four cars off the road.

Land is required to produce food and drink that is subsequently thrown away by UK households. For the first time, an estimate has been made of these land requirements: 19,000 square kilometres or an area about 91% the size of Wales.

## Reasons for throwing away food that could have been eaten<sup>13</sup> (Figures G and H)

Just under half of avoidable food and drink waste (worth £5.6 billion) was classified as 'not used in time': thrown away because it had either gone off or passed the date on the packaging. This included large amounts of bread, milk and fresh potatoes.

A further 31% (worth £4.1 billion) was classified as 'cooked, prepared or served too much': this included food and drink that had been left over after preparation or serving, such as carbonated soft drinks, home-made and pre-prepared meals, and cooked potatoes.

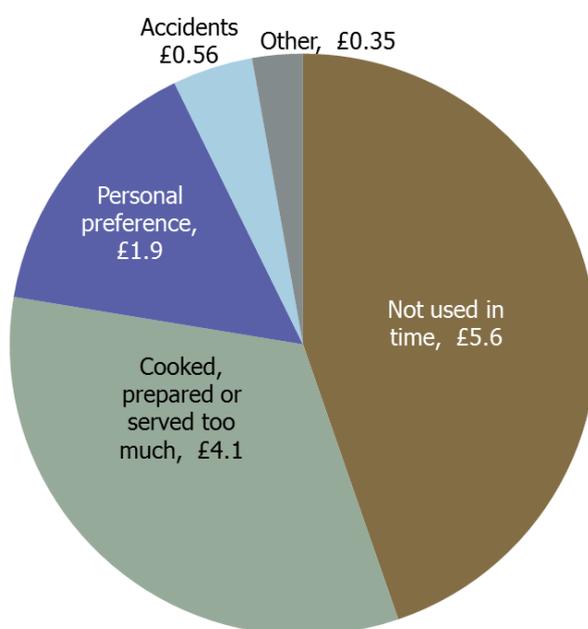
Approximately 80% of food and drink is wasted because it either wasn't used in time, or too much was cooked, prepared or served, so addressing these issues will deliver the greatest benefits.

The remaining reasons are linked to personal preferences including health reasons and not liking certain foods (£1.9 billion), and accidents, including 'food dropped on the floor' and 'failure of a freezer' (£560 million).

The reasons for disposal vary considerably by food group. For the following categories, most was wasted because it was not used in time: fresh vegetables and salads, bakery, dairy and eggs, and fruit. For example, avoidable fresh vegetable and salad wasted because it was not used in time cost £1.1 billion, approximately two-thirds of the total cost of fresh vegetables and salads thrown away.

In contrast, drinks and meal waste had high levels of waste from leftovers: too much was prepared, cooked or served.

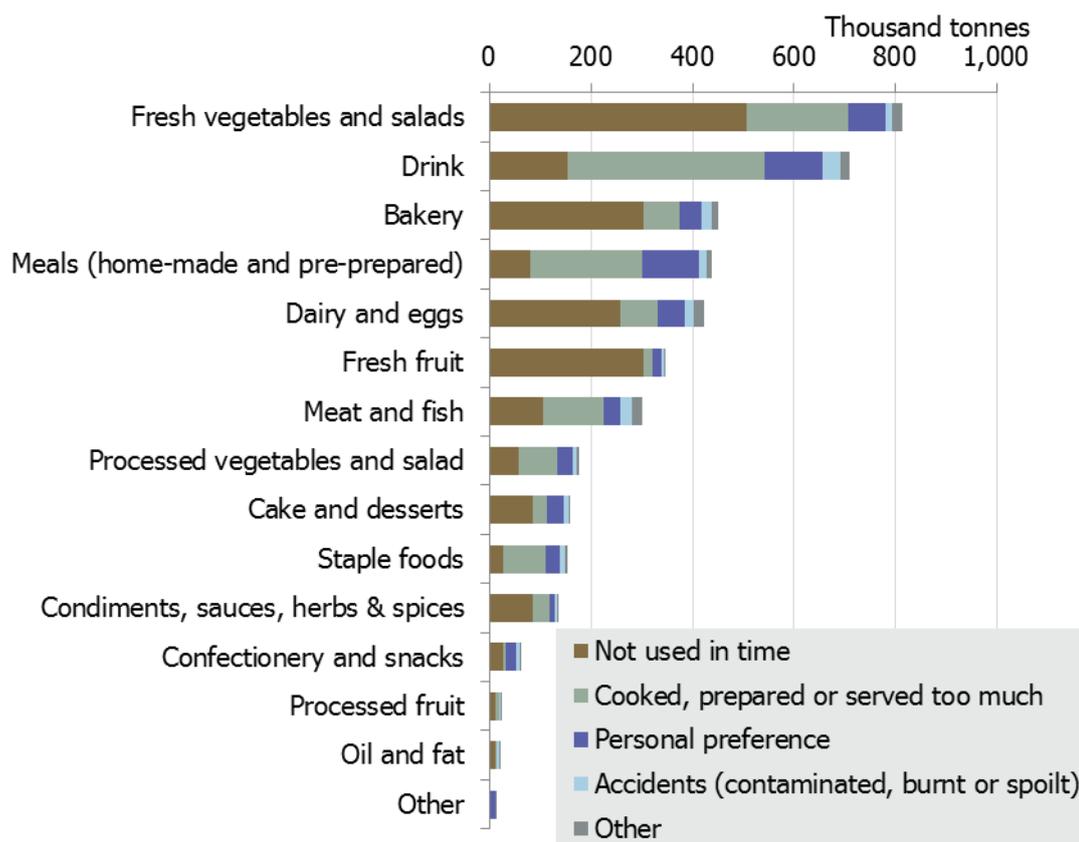
**Figure G:** Cost of avoidable household waste by food and drink in 2012, split by reason for disposal



*Figures within chart state waste in billions of pounds*

<sup>13</sup> Two additional categories of 'reasons' were added in the 2012 analysis ('personal preference' and 'accidents') meaning it is not possible to make direct comparisons in this section with the 2007 results.

**Figure H:** Weight of avoidable food and drink waste by food group, split by reason for disposal<sup>14</sup>



Alongside other research, such as the recent evaluation of the positive impact of a six-month LFHW campaign in West London<sup>15</sup> (which indicated up to a 14% reduction in avoidable food waste), this work demonstrates that change is possible: households can reduce the amount of food and drink waste they generate considerably. This may be as a direct result of engagement campaigns, in response to how food is sold and is packaged, or linked to food price inflation and other economic factors. New research by WRAP investigating the influences on food waste and food purchases will be published in winter 2013.

A range of behaviours (buying appropriate amounts, storing food under the optimal conditions, portion control, using the freezer more effectively and making the most of leftovers etc.) and technical innovations (range of pack sizes available, improved storage and freezing guidance, clearer date labelling, increased shelf-life, packaging innovations etc.) will have contributed to the reductions seen in many categories, supported by LFHW and other campaigns through a wide range of national and local initiatives.

Further analysis is in progress to understand why there were smaller, or no, reductions in other categories, and what more can be done to help reduce the waste of these types of food. For fresh vegetables and salad waste this is important as it makes up almost 20% (by weight) of the avoidable household food and drink waste. Buying the right amounts, storing produce correctly (in particular making better use of packaging, as highlighted by LFHW and Fresher for Longer<sup>16</sup>), understanding 'best before' dates and what can be done with 'tired'

<sup>14</sup> Staple foods include breakfast cereals, pasta, rice, couscous, etc.

<sup>15</sup> <http://www.wrap.org.uk/content/west-london-food-waste-campaign>

<sup>16</sup> <http://www.wrap.org.uk/fresherforlonger>; <http://england.lovefoodhatwaste.com/content/fresher-longer-0>

vegetables can all make a big difference. Similarly, retailers and brands are looking at how changing pack sizes, promotions, date labelling and shelf-life can make it easier for people to waste less.

For fresh meat and fish this is also important, due to its high value (financial, environmental and ethical). Buying the right amounts, understanding 'use by' dates and making more use of the freezer (whole packs or part contents; raw and cooked meat) can all make a big difference. Similarly, retailers and brands have a role to play, looking at pack sizes, date labelling, freezing guidance and shelf-life (e.g. through innovative packaging).

The results presented here are consistent with those found in the recent evaluation of the LFHW campaign<sup>17</sup>, where the majority of the reduction in avoidable household food and drink waste occurred in 'cooked food', with no significant change found for meat and fish, or fresh fruit and vegetables.

Importantly, there is more to do in all the categories of food waste and no one area has improved so much that further action would not deliver significant benefits.

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<sup>17</sup> <http://www.wrap.org.uk/content/west-london-food-waste-campaign>

## **What happens next?**

This report has demonstrated that there have been substantial reductions in the amount of household food and drink waste generated in the UK between 2007 and 2012, and has highlighted the magnitude of the opportunity remaining. It has provided detailed data on the types of food and drink wasted in 2012, and the reasons for its disposal.

Further analysis, in progress by WRAP, includes developing a better understanding of the amount and types of food and drink waste for different types of household, and the relationship between food and drink waste and the responses to household interviews (e.g. relating to specific attitudes and behaviours) that were conducted as part of this research. Such information will help understand the reasons why the amount of food and drink waste has fallen so substantially, and why reductions differed between categories (which is likely to reflect the different challenges faced in terms of changing behaviours and products). All of this information will help us continue to develop and target more tailored messages, guidance and solutions for different groups of people.

Detailed data on specific types of food waste will also be obtained: for instance, at the product level, how much is thrown away in the original packaging, what the dates were on this packaging, and what proportion of the pack was wasted. From the diary research, it will also be possible to determine the weight of each instance of waste: this helps identify if a lot of material is being thrown away in small amounts, or as relatively few (but large) amounts. This information will help the food industry optimise products, packaging and labelling to reduce the likelihood of a product being wasted.

There is also a need to understand how this information fits with purchasing data (e.g. Defra's Family Food survey) and consumption data (e.g. the National Diet and Nutrition Survey). Preliminary analysis suggests that the amount of food and drink brought into the home per person has declined; this is qualitatively consistent with the decrease in waste levels<sup>18</sup>. However, further analysis would be beneficial to understand how changes in population, levels of eating outside the home, and changes in diet are influencing purchases, consumption and waste.

This information will further develop our understanding of food waste specifically, as well as how it fits with other food- and waste-related issues. This deeper understanding will aid prioritisation of action to reduce food and drink waste, helping to tackle the issue in a targeted, cost effective and appropriate way. This, together with other analyses, may help forecast levels of household food and drink waste in the future, and determine how far it might be possible to further reduce it. Understanding what types of food and drink are found in different waste streams and how this might change over time, will be of interest to those involved in the management of food waste, as different types of waste could affect both processability and yield (for example in terms of energy generated) of any treatment.

WRAP and LFHW will be updating their guidance and tools for consumers and resources for partners in the light of this research, and the planned further analysis. Links to all of WRAP's previous research on food and drink waste, and resources available for partners can be found at: [www.wrap.org.uk/waste-resource-listing](http://www.wrap.org.uk/waste-resource-listing).

These new insights will also form the basis of discussions with Governments, local authorities, retailers, food brands and manufacturers to maximise the impact of our collective actions in the future.

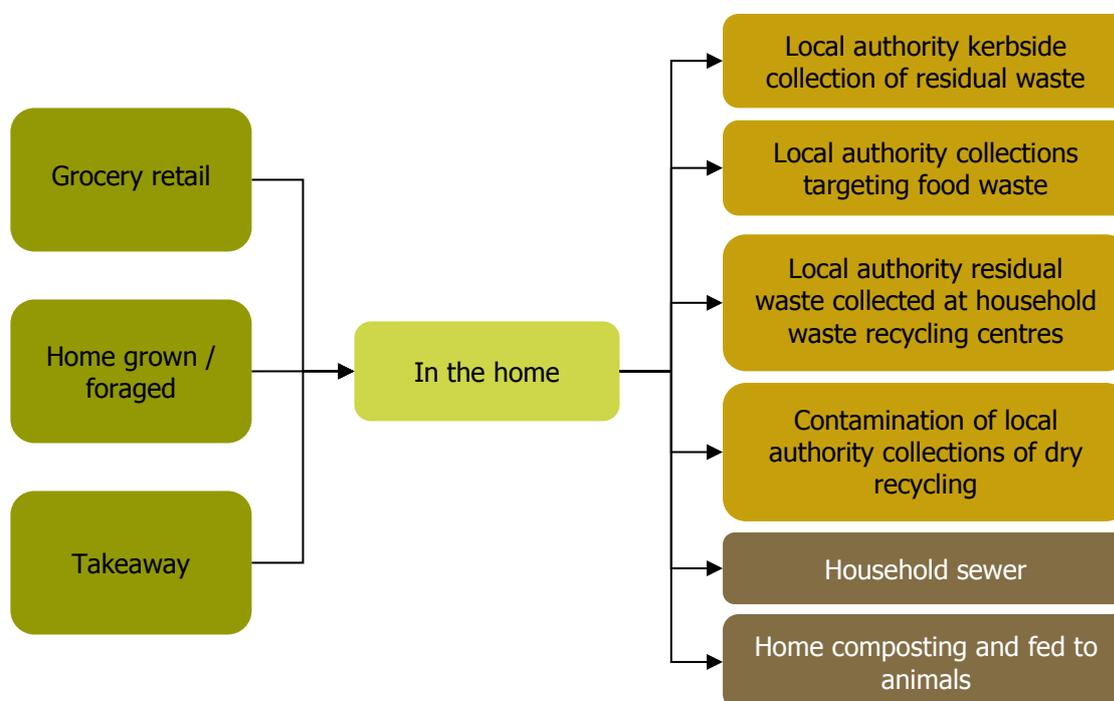
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<sup>18</sup> 2012 food purchase data was not available at the time of writing this report.

## Background and methodological details

The estimates in the main report cover the routes illustrated in Figure I, but exclude waste collected from offices, catering establishments, litter, and street sweepings. It also excludes food and drink waste from agriculture, food processors and manufacturers, retailers and wholesalers. All data is for the UK as a whole.

**Figure I:** Schematic of sources and disposal routes of household food and drink waste



The estimates for household food and drink waste are derived from three main pieces of research:

- **Synthesis of Food Waste Compositional Data 2012:** collates information from recent waste audits commissioned by local authorities and WasteDataFlow (a reporting system for waste collected by local authorities in the UK) to obtain an estimate of household food and drink waste collected by local authorities.
- **Detailed waste compositional analysis:** research quantifying the weight and types of food and drink waste from approximately 1,800 consenting households (conducted in 2013).
- **Kitchen Diary 2012 research:** use of diary keeping to record waste from all disposal routes from the home. Diary keepers also recorded why each item was thrown away.

The details of these pieces of research and how the information was synthesised to generate the results in this report are detailed in a *Methods Annex Report*, published alongside this report<sup>19</sup>. Further details of the Synthesis study are published in a separate report alongside the *Methods Annex*. The figures in the main report are generally comparable to those of a previous report, *Household Food and Drink Waste in the UK*<sup>20</sup> (published in 2009), which restates 2007 estimates.

<sup>19</sup> <http://www.wrap.org.uk/household-food-waste>

<sup>20</sup> <http://www.wrap.org.uk/sites/files/wrap/Household%20food%20and%20drink%20waste%20in%20the%20UK%20-%20report.pdf>

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