Final Report

Household food waste: restated data for 2007-2015

This report restates existing estimates for the amounts of food waste produced by UK households between 2007 and 2015. The information has been restated to align it with new international standards that WRAP helped to develop.

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Executive summary

This report restates previous estimates of the quantity and types of food and drink waste[1] generated by UK households. Detailed information is presented for 2012 (the last year with sufficiently detailed fieldwork), alongside estimates of the total food waste for 2007, 2010, 2014 and 2015. 2015 is the latest year for which an estimate of UK household food waste has been calculated[2].

No new fieldwork or data collection has been conducted for this report. It presents previously published data which has been reinterpreted using the most recent international definitions and classifications relating to food waste.

Consumer research has been undertaken however, to understand the degree to which different parts of food items are considered edible by the UK population. An approach has been developed to use these insights to estimate the proportion of household food waste that should be classified as inedible parts as opposed to food that could have been eaten. To the authors' knowledge, the method is the first of its kind. It is hoped that this approach could be reproduced and developed so that it forms the basis of a standardised methodology that can be applied internationally.

Background and rationale

Recent initiatives, including the Sustainable Development Goal 12.3, have led to a movement for cooperation and communication to reduce food waste globally. This is represented in the *Food Loss and Waste Accounting and Reporting Standard* (FLWS)[3], a standard designed to inform and motivate reporting entities to quantify and reduce their food waste. As a leader in this field and a contributing organisation to the FLWS, WRAP has decided to align its reporting more closely to the Standard.

In practice, for UK household food waste, this decision required only a small change in classification and reporting. Previously, WRAP had reported food waste in terms of 'avoidability' and in three fractions. However, the framework of the FLWS refers to just two fractions: wasted food and its associated inedible parts (e.g. bones, rinds, stones). This report is a reclassification of our existing data in line with this framework.

Reviewing the household estimates also provided the opportunity to make WRAP's reporting more consistent across the supply chain, which has led to another minor adjustment to the figures.

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[1] *For brevity, this report will henceforth refer to food waste, understanding that this includes wasted drink.*

[2] *Updated estimates will be published in 2019, 2022 and 2026 as part of reporting on progress against the Courtauld Commitment 2025 targets.*

[3] *Food Loss and Waste Accounting and Reporting Standard*. (2016) [online] available at: www.flwprotocol.org

Method

The first change is that food fed to animals (but purchased for human consumption) is no longer classified as household food waste, aligning with how animal feed is classified in other stages of the supply chain.

Next, items found in 'food' waste previously classified as avoidable, possibly avoidable or unavoidable have now been reclassified as wasted food or inedible parts. This required an assessment of which elements of the waste are considered to be food and which inedible parts. It also required a further decision on the percentages of whole items in each classification (e.g. how much of a whole banana is skin [the inedible part] and how much flesh [the food]).

Further small changes have been made to calculating the relationship between reasons for discarding food and the cost of food waste.

Changes to results

The above changes have resulted in the following:

- The total amount of UK household food waste is slightly lower after restating than before. For instance, in 2015, the amount of food waste previously reported[4] was 7.3 million tonnes; after restating (this report) it was 7.1 million tonnes.
- The difference due to restating (c. 280,000 tonnes) is due to the omission of food (originally purchased for human consumption) that is fed to animals.

Given the omission of food fed to animals, the *proportions* of the total food waste going to the other discard routes increased slightly. The percentages for 2015 are:

- local authority collected food waste accounted for 69%: which is made up of residual (58%), collections targeting food waste (9%), and other (2%),
- sewer disposal 23%, and
- home composting 7%.[5]

The biggest change relating to the restating of the results is around 'edibility' – the new classification uses two categories, which replaces the method based on avoidability (three categories). The new categories are:

- **Wasted food** (also referred to as **edible parts**) – products (or parts of products) intended for human consumption.
- **Inedible parts** – components associated with a food that are not usually consumed by humans in the UK. Examples of inedible parts associated with food could include bones, rinds, and pits/stones. 'Inedible parts' do not include packaging.

The total of these two components is defined as food waste:

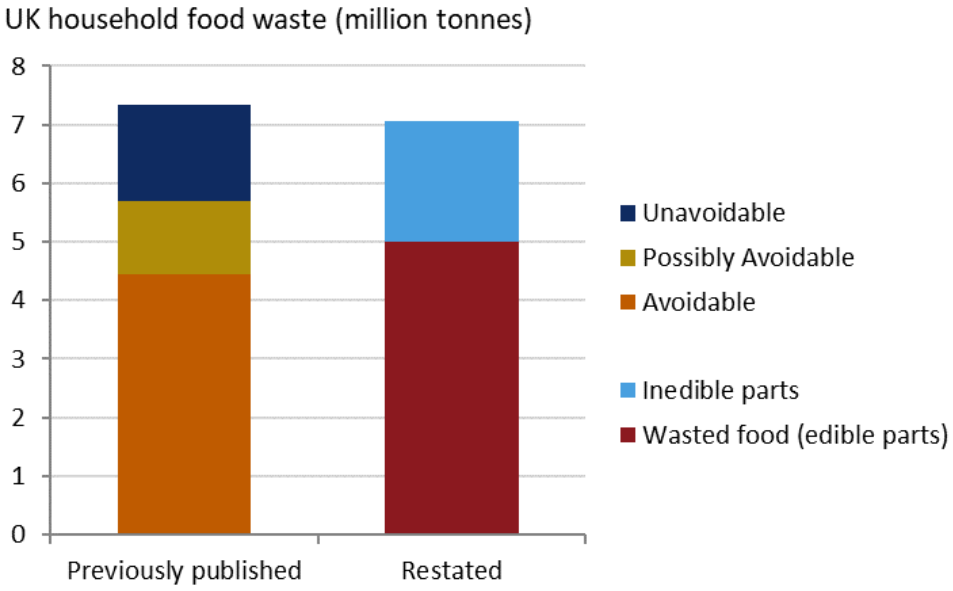
$$Food\ waste = Wasted\ food\ (edible\ parts) + Inedible\ parts$$

[4] *Household Food Waste in the UK, 2015* (WRAP, 2017)
http://www.wrap.org.uk/sites/files/wrap/Household_food_waste_in_the_UK_2015_Report.pdf

[5] *Percentages do not add up to 100 due to rounding convention.*

The amount of wasted food (e.g. five million tonnes in 2015) is greater than the previously stated amount of avoidable food waste (4.4 million tonnes in 2015) – Figure ES1. This is because some food waste previously classified as possibly avoidable (e.g. bread crusts and end slices) is now classified as wasted food (edible parts).

Figure ES1: Comparison of household food waste in the UK for 2015, as previously published and restated (tonnes)



The amount of wasted food is less than the sum of avoidable and possibly avoidable food waste. This is for two main reasons:

- Some possibly avoidable waste was classified as inedible parts (e.g. bay leaves, carrot ends).
- Items containing edible and inedible parts are now split into these two categories, whereas previously they were classified according to the majority part, usually avoidable. For example, a banana discarded whole was previously classified as avoidable (the majority part), whereas now the weight of the banana is split between food (the flesh) and inedible parts (skin / peel).

Table ES1: Comparison of household food waste in the UK for 2015, as previously published and restated (tonnes)

	Previously published	Restated (this report)	% difference
Avoidable	4.4 million tonnes	n/a	n/a
Possibly avoidable	1.3 million tonnes	n/a	n/a
Unavoidable	1.6 million tonnes	n/a	n/a
Wasted food (edible parts)	n/a	5.0 million tonnes	n/a
Inedible parts	n/a	2.1 million tonnes	n/a
Total (weight)	7.3 million	7.1 million tonnes	–4%
Total (cost)	£13.0 billion	£14.9 billion	+14%

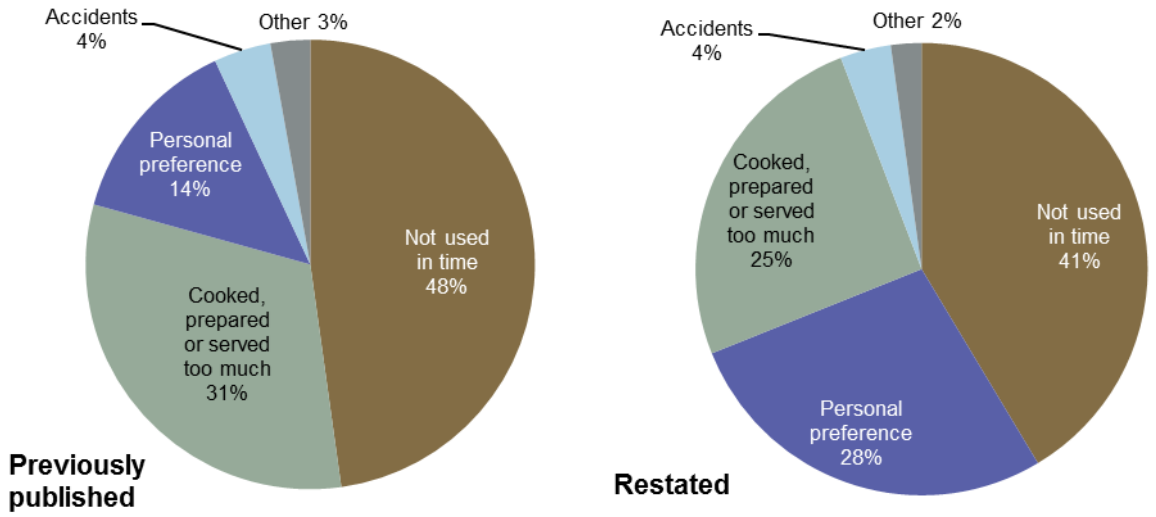
Table ES2: Comparison of household food waste in the UK for 2015, as previously published and restated (per capita)

	Previously published	Restated (this report)	% difference
Avoidable	68 kg	n/a	n/a
Possibly avoidable	19 kg	n/a	n/a
Unavoidable	25 kg	n/a	n/a
Wasted food (edible parts)	n/a	77 kg	n/a
Inedible parts	n/a	32 kg	n/a
Total (weight)	113 kg	108 kg	–4%
Total (cost)	£200	£230	+14%

When considering the cost and environmental impact of wasted food (rather than avoidable waste as considered previously), there have been small but significant increases. For example, the total cost of household food waste in the UK in 2015 was £14.9 billion (restated) compared to £13.0 billion as previously published. Similarly, the greenhouse gas emissions associated with UK HHFW in 2015 are estimated at 22 million tonnes CO_2 eq., compared to the previous figure of 19 million tonnes CO_2 eq. These increases primarily correspond to calculations now based on the greater weight of wasted food (edible parts) as opposed to avoidable food waste as calculated previously.

One change stemming from the change in classification of food waste is that a higher proportion of food is wasted due to personal preference under the new definition compared to the original definition (Figure ES2). This is due to the items previously classified as possibly avoidable that are now classified as edible parts; for most of these, the reason for discarding given in the kitchen diaries was related to personal preference. Before restating, personal preference was the third most important reason why food was thrown away and accounted for 14% of avoidable food waste; it is now second, accounting for 28% of wasted food. Food wasted because it was not used in time was still the largest proportion by both weight (41%) and cost (43%).

Figure ES2: Comparison of reasons for discarding household food waste in the UK, as previously published and restated (percentage by weight)



Practical considerations resulting from the changes

One key question stemming from this work is: "should those attempting to influence the amount of household food waste in the UK do anything differently because of these restated results?"

Considering the most wasted items in 2012 before and after the restating, only two food types in the original top 20 are no longer present: bananas and onions, mainly due to the way in which whole items comprising food and inedible parts are treated in the analysis. These are replaced by oil and lettuce, both of which have had possibly avoidable material reclassified as food (Figure ES3).

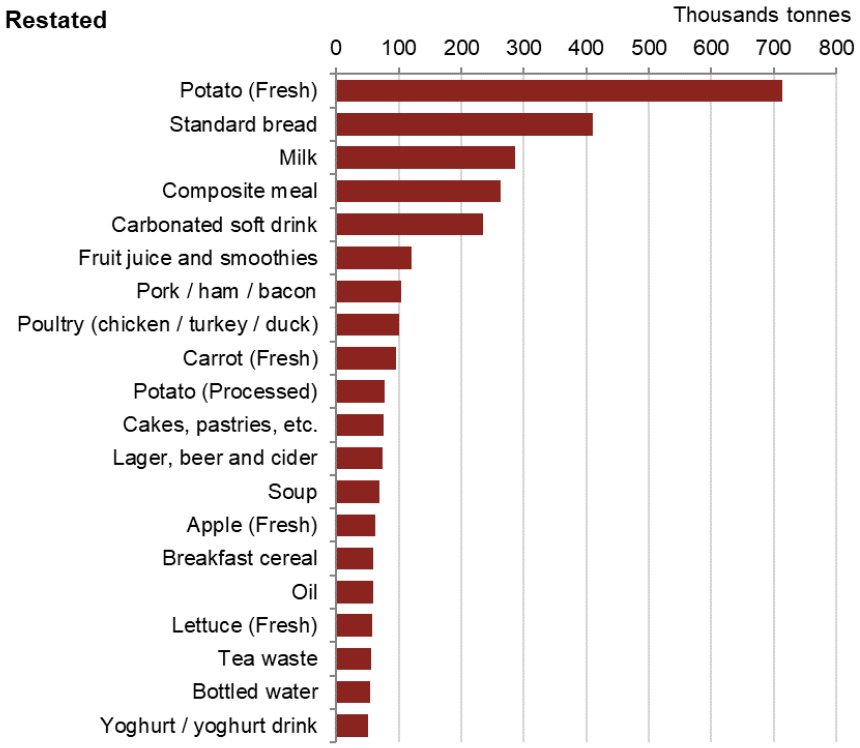
Some items have changed position – fresh potato is now the number one item by weight, due to the reclassification of potato skin / peel from possibly avoidable to edible food that has been wasted. It is now the number one food type by some margin. For a similar reason, carrots have also moved up from 13th position to ninth.

Although weight is not the only metric that should be used to prioritise food waste – cost, environmental impact and nutritional value should be considered in different circumstances, these rankings are calculated from weight data. Therefore, this analysis shows that priority food types have remained largely unchanged because of this restating process.

Despite the similarity in the ranking of most wasted items after the change in definition, as stated above, a higher proportion of food is wasted due to personal preference under the new definition. This is because previously less emphasis was given to possibly avoidable food waste (e.g. bread crusts and potato peel) which some people prefer not to eat; personal preference was a smaller component of the avoidable fraction used in headline figures previously. Crusts and potato skins are now considered edible food waste and so the preference of some people not to eat them features as a more common reason for edible food being wasted. Therefore, the new analysis suggests that

influencing this type of wasted food is more important than previously thought. This is a challenging area to tackle, but potentially warrants greater attention in the future.

Figure ES3: Top 20 food types thrown away in 2012, by weight. Data for wasted food (i.e. edible parts) only.



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Glossary

- **Discard route** – the method by which household food waste is removed from the home after it has been discarded by the households' occupants. Previously referred to as "disposal route", now changed to reflect that not all actions of discarding food in the home result in disposal; home composting and anaerobic digestion are productive uses of food waste.

- **Edible parts** – see (wasted) food.

- **Edibility** – The distinction between whether an item of food waste is considered as edible parts (i.e. wasted food) or inedible parts. This does not refer to the state of the item of waste at the point of discarding.

- **Food waste** – equal to the sum of edible and inedible parts. Household food waste is the material that leaves the home for the following processes: composting, anaerobic digestion, incineration, disposal to sewer, or landfill. Food waste excludes material subject to waste prevention activities, namely redistribution for human consumption or fed to animals.

- **Inedible parts** – Components associated with a food that, in a particular food supply chain, are not intended to be consumed by humans. Examples of inedible parts associated with food could include bones, rinds, and pits/stones. "Inedible parts" do not include packaging.

- **Local authority collected waste** – in this report, this refers to the waste streams collected by, or on behalf of, the local authorities from households; those containing food waste include kerbside residual waste (the 'general' bin) and collections targeting food waste (either separate or mixed with garden waste), with minor contributions from residual waste from household waste recycling centres and contamination of kerbside dry recycling.

- **Sewer** – one of the major household discard routes of food waste in this report, including material disposed of via the sink, toilet or other inlet to the sewer system.

- **(Wasted) food** (also referred to as **edible parts**) – products (or parts of products) intended for human consumption. This includes material which is still suitable for consumption when it is disposed of (i.e. would be regarded as 'edible') and that which may no longer be suitable for consumption at the point of discarding (for example due to it passing a 'use by' date or being spoiled). It excludes inedible parts.

Acronyms

- **Defra** – UK Department of Environment, Food and Rural Affairs
- **FLWS** – Food Loss and Waste Accounting and Reporting Standard
- **HHFW** – Household food waste
- **LA** – Local Authority
- **WRAP** – Waste & Resources Action Programme
- **WRI** – World Resources Institute

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1.0 Introduction

1.1 Context and rationale for this report

This report restates estimates of the quantity and types of food waste generated by UK households. Detailed information is presented for 2012 (the last year with sufficiently detailed fieldwork), alongside estimates of the total food waste for 2007, 2010, 2014 and 2015. The original estimates were published in:

- *Household Food and Drink Waste in the UK*[6] [2007].
- *Household Food and Drink Waste in the UK 2012*[7].
- *Household Food and Drink Waste in the UK 2015*[8].

Recent initiatives, including the Sustainable Development Goal 12.3, have led to a movement for cooperation and communication to reduce food waste globally. This is represented in the *Food Loss and Waste Accounting and Reporting Standard* (FLWS)[9], a standard designed to inform and motivate reporting entities to reduce their food waste. As a leader in this field and a contributing organisation to the FLWS, WRAP has decided to align its reporting more closely to the Standard.

In practice, for UK household food waste, this decision required only a small change in classification and reporting of this waste. Previously, WRAP had reported food waste in terms of 'avoidability'. Items of waste were avoidable (largely or wholly edible), unavoidable (largely inedible), or 'possibly avoidable', which was used for items that divided opinion (i.e. parts of items that are eaten in some circumstance, or by some people, but not others, for example potato peelings).

However, the FLWS recommends that food waste is classified into two fractions: wasted food or associated inedible parts. This report is a reclassification of our existing data in line with this recommendation.

Reviewing the household estimates also provided the opportunity to make WRAP's reporting more consistent across the supply chain. Therefore, we decided to remove from the definition of food waste items of food that are fed to animals, in line with WRAP estimates for food waste in the supply chain.

1.2 Structure of this report

The restated figures for UK household food waste are presented below in headline for 2007, 2010, 2012, 2014 and 2015. More detailed information on types of food wasted is presented for 2012 only. The report is written as a companion for the corresponding previous publications listed in Section 1.1 above and is structured to reflect this.

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[6] WRAP. (2009a). *Household Food and Drink Waste in the UK.* [online] available at: http://www.wrap.org.uk/sites/files/wrap/Household%20food%20and%20drink%20waste%20in%20the%20UK%20-%20report.pdf.

[7] WRAP. (2013a). *Household Food and Drink Waste in the United Kingdom 2012*. [online] available at: http://www.wrap.org.uk/sites/files/wrap/hhfdw-2012-main.pdf.pdf
Detail on the how those estimates were obtained can be found in the Annex to the 2012 report: Methods used for Household Food and Drink Waste in the UK 2012.

[8] WRAP. (2017). *Household Food Waste in the UK, 2015*. [online] available at: http://www.wrap.org.uk/sites/files/wrap/Household_food_waste_in_the_UK_2015_Report.pdf.

[9] Food Loss + Waste Protocol. (2016). *Food Loss and Waste Accounting and Reporting Standard*. [online] available at: https://www.wri.org/sites/default/files/REP_FLW_Standard.pdf.

Beyond the context given above, the background to the changes made to the UK household food waste estimates is summarised in Section 2.1. The remainder of Chapter 2.0 considers how food waste was classified into wasted food and inedible parts, the overall adjustments made to the methodology used to calculate UK household food waste estimates previously and some notes on how information is reported.

Chapter 3.0 presents the main differences to results based on the changes in methodology. Detailed time series results for total food waste can be found in Chapter 4.0, along with results in terms of reasons for discarding[10], proportions of purchases wasted, the cost and environment impact of food waste for 2012 and 2015 (where possible).

Chapter 5.0 breaks down the results in more detail by food group for 2012.

[10] WRAP has previously referred to the act of discarding food from/in the home as 'disposal'. However, to better align with the FLWS and because not all food discarded is disposed of, the authors have used 'discard' instead.

2.0 Methodology

This chapter contains details of the methods used for estimating the amount of household food waste (HHFW) in the UK. It is divided into four sections:

- Changes to definitions and classification for UK household food waste that precipitated the work to restate HHFW estimates (section 2.1)
- The methods used for 2007 and 2012, for which there is detailed information from waste compositional analysis and kitchen diaries (section 2.2)
- The method used for other years (2010, 2014 and 2015): for these years, there is information about the amount of local-authority collected food waste; for other discard routes, the estimates have been developed through modelling (section 2.3)
- Some notes on reporting conventions used in this publication (section 2.4)

2.1 Changes to UK HHFW definitions and classification

Adopting the FLWS has required adjustments to the way WRAP defines and reports on household food waste in the UK. The following sections outline the background behind these changes, their implementation and the impact on how WRAP calculates annual figures.

2.1.1 Omission of food fed to animals

The first change is that food fed to animals (but purchased for human consumption) is no longer classified as household food waste, aligning with other stages in the supply chain. This includes food fed to pets, wild animals such as birds, or animals kept for food-related purposes (e.g. chickens for eggs). This change is relatively straightforward; the estimate of household food waste is already broken down by the waste's destination, with one destination being fed to animals. This change requires the removal from the estimate of food waste associated with this destination. For completeness however, the amounts associated with this are reported separately in Appendix A.

2.1.2 Overview of food waste classification

As discussed above, WRAP previously classified household food waste into three categories according its 'avoidability', defined in *Household Food and Drink Waste in the UK 2012*[11]:

- **Avoidable**: food and drink thrown away because it is no longer wanted or has been allowed to go past its best. The vast majority of avoidable food is composed of material that was, at some point prior to discarding, edible, even though a proportion is not edible at the time of discarding due to deterioration (e.g. gone mouldy)[12]. In contrast to 'possibly avoidable' (see below), the category of 'avoidable' includes foods or parts of food that are considered edible by the majority of people.

[11] WRAP. (2013a). Household Food and Drink Waste in the United Kingdom 2012. [online] available at: http://www.wrap.org.uk/sites/files/wrap/hhfdw-2012-main.pdf.pdf

[12] *There are two exceptions to this rule: a) inedible items that are thrown away unused (e.g. unused tea bags), and b) the unavoidable fraction of whole items thrown away (e.g. the banana skin of a whole banana) - this material was all classified as avoidable, rather than split into the avoidable (banana flesh) and unavoidable fractions (banana peel). One can argue that in both cases that the waste was avoidable, but it is not material that was edible.*

- **Possibly avoidable**: food and drink that some people eat and others do not (e.g. bread crusts and potato skins). As with 'avoidable' waste, 'possibly avoidable' waste is composed of material that was, at some point prior to discarding, edible.
- **Unavoidable**: waste arising from food and drink preparation that is not, and has not been, edible under normal circumstances[13]. This includes egg shells, pineapple skin, apple cores, meat bones, tea bags, and coffee grounds.

The new definition contains just two categories – wasted food (also referred to as edible parts) and the associated inedible parts. This means a change from three categories to two. This presents an opportunity to assess what should be considered as food and what is considered the associated inedible parts. This is discussed in Section 2.1.3.

There is another change that stems from this new classification: whole items are now treated differently. In the past, a whole item thrown away (e.g. a banana) was classified in its entirety as avoidable.

However, this approach does not fit with the new categories. For the example of the banana, the flesh should be classified as food (i.e. an edible part) and the peel as an inedible part, irrespective of whether these two parts are thrown away together or separately. This means that, for items thrown away containing both edible and inedible parts, an estimate of the proportion of each needs to be made (e.g. the proportion of a whole banana that is flesh and that which is peel). The FLWS provides guidance in its Appendix B on a range of sources that could be used for these proportions.

The new terminology that WRAP is adopting is reproduced below for easy reference.

Food waste: Food and the inedible parts of food removed from the food supply chain (or household) to be recovered or disposed of (including - composted, anaerobic digestion, incineration, disposal to sewer or landfill). This definition excludes waste prevention activities, namely redistribution for human consumption, or diverted to feed animals[14].

> **Wasted food** (also referred to as **edible parts**): products (or parts of products) intended for human consumption. This includes material which is still suitable for consumption when it is disposed of (i.e. would be regarded as 'edible') and that which may no longer be suitable for consumption at the point of discarding (e.g. for example due to it passing a 'use by' date or being spoiled). It excludes inedible parts.
>
> **Inedible parts**: Components associated with a food that are not intended for human consumption. Examples of inedible parts associated with food could include bones, rinds, and pits/stones. "Inedible parts" do not include packaging. What is considered inedible varies among users (e.g., chicken feet are consumed in some food supply chains but not others), changes over time, and is influenced by a range

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[13] This definition takes a pragmatic view as strictly speaking, most material classified as unavoidable could be ingested – drinks can be made from egg shells, stock from animal bones, marmalade from citrus peel, and pickle from melon rind. Therefore, inedible is defined as unpalatable to the vast majority of the population without substantial preparation.

[14] The FUSIONS project, through extensive consultation, published a food waste 'definitional framework' and definition which is largely consistent with this definition, in terms of covering both food and inedible parts and the relevant destinations.

of variables including culture, socio-economic factors, availability, price, technological advances, international trade, and geography.

Therefore, these three terms are related according to the equation below:

$$Food\ waste = Wasted\ food\ (edible\ parts) + Inedible\ parts$$

However, these definitions do not provide an objective method for determining whether a particular part of an item should be classified as an edible or inedible part. Section 6.4 of the FLWS provides guidance on categorising material types and a few potential approaches are suggested.

One rule of thumb for classification – intended for classification within the supply chain – is whether the product is sold or not. This is difficult to apply in the case of household food waste as it is at the end of the supply chain: where food is usually consumed or discarded (rather than being sold).

Another option is to align FLWS definition to existing frameworks. However, in the case of household food waste, there are few, if any, existing frameworks. For instance, during the drafting of the recent FUSIONS manual for food waste quantification[15], no such frameworks were identified for households, despite extensive searching and discussion with relevant experts. The only material found was WRAP's previous classification from *Household Food and Drink Waste in the UK 2012*[16], which forms an appendix in the FUSIONS manual.

The FLWS also discusses cultural factors as determinants for what is considered 'intended for human consumption'. For previous WRAP reports on household food waste, the authors attempted to align the classification of avoidability with cultural practices using their own judgement of what was typically eaten in the UK.

Given the above discussion, using cultural norms as the basis for classification was the most promising option. Attempts were made to develop a set of formal criteria that could be applied to an item to determine whether it was considered food or an inedible part, but these were either highly subjective or required prior knowledge of what people in the UK ate or considered edible/inedible.

Therefore, an approach was developed that asked, via a questionnaire survey, the views of the UK public on which items they ate and which they considered 'edible' (i.e. food) or 'inedible'. This provided a process to better align the classification with cultural norms in the UK. This process is described in the next section.

This means that the definition of what is considered food or an inedible part is informed by UK culture and eating habits. It does *not* describe what is ingestible and/or digestible:

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[15] Tostivint, C. et al. (2016). *FUSIONS: Food waste quantification manual to monitor food waste amounts and progression*. [online] available at: http://www.eu-fusions.org/phocadownload/Publications/Food%20waste%20quantification%20manual%20to%20monitor%20food%20waste%20amounts%20and%20progression.pdf

[16] WRAP. (2013a). Household Food and Drink Waste in the United Kingdom 2012. [online] available at: http://www.wrap.org.uk/sites/files/wrap/hhfdw-2012-main.pdf.pdf

with sufficient processing, all items thrown away could be made into something ingestible and some would be digestible in part or in whole.

2.1.3 Method adopted for classifying food and associated inedible parts

This section contains details on how an item was classified as either food or an associated inedible part, using a survey-based method developed during this project.

For a given item, there is likely to be a spectrum of options as to its 'edibility'. Some items may be almost universally regarded as food (e.g. bread crusts) while others may be almost universally regarded as an inedible part associated with a type of food (e.g. egg shells). In between, there are items that some people will consider as inedible, while others will not. To make this classification, a line needs to be drawn somewhere on this spectrum, ideally in a transparent and reproducible way. Making a classification in this way will mean that there will be some people who believe that some items are being misclassified. For this reason, the authors have drawn on the views of a sample of the UK population and, where possible, gone with the majority view.

Two questions were developed to inform the classification of food items. The first asks which items / parts of items people actually eat, and the second about which items they consider edible and which inedible, whether or not they eat them themselves.

The two questions were asked about sixteen different parts of items (e.g. apple peel, parsnip peel). These items were chosen because a) they represented a substantial amount of waste as previously determined from waste compositional analysis and diary research, b) their 'edibility' was judged to be 'borderline' by the authors, and c) they could be used as proxies for other items.

During internal pilots of the questionnaire it was found that including bones in these questions led to confusion. People found it difficult to categorise bones if they usually made stock with them, a process in which a fraction of the material is incorporated into the stock. For this reason, bones were omitted from these two questions. Two additional questions were created, focusing on if people used bones to make stock and the degree to which they did this. The final survey questions are found in Appendix B.

The questionnaire survey was conducted by a polling company (Populus) using an on-line poll between 20th and 22nd September 2017 and was answered by a sample of 1,092 adults. Quotas were set on age, gender and region, based on the 2012 National Readership Survey (a random probability face-to-face survey conducted annually with 34,000 adults). The data was weighted to the known profile of the UK using age, gender, government office region, social grade, taken a foreign holiday in the last 3 years, tenure, number of cars in the household and working status.

Information from the two questions was used to determine whether or not these sixteen items were considered 'edible' or inedible. The classification reflects what people state that they eat as well as what they would generally consider edible. The results show a considerable difference between the responses to the two questions for some items. There are some items (e.g. orange peel) that few people eat, but more than half consider 'edible' (at least under some circumstances). By using both questions, this

means that both of these differing pieces of information influence the results, making a balanced, composite measure.

A score was assigned to the answers given to each question based on the response (e.g. 1 for "always", 1/3 for "occasionally") and average taken across the respondents' answers for each item to obtain a score for each item for each question. For a given item, the average score was calculated for the two questions, providing a single value to reflect its perceived edibility from the UK population. Items that scored above 0.5 were classified as 'edible' (i.e. food); items scoring below 0.5 were classified as 'inedible parts'. More detail on this method can be found in Appendix C.

Of the items in the questionnaire – the following items were classified as edible (i.e. food):

- Crusts of bread slice
- End slices of loaf
- Apple skin
- Cooked chicken skin
- Potato skin
- Bacon rind
- Broccoli stalk
- Cauliflower stalk
- Outer cabbage leaves
- Carrot skin

The following were classified as inedible parts:

- Apple core
- Orange peel (including the zest)
- Cabbage - stem & hard centre
- Parsnip skin
- Oil drained from a fish tin

The question on bones revealed that the majority of people (72%) did not use them to make stock. Of those who did, not all bones coming into the household were used for stock – probably around half given the responses to the questions. Since the overwhelming majority of bones were not used for making stock, and only a small fraction of their weight was incorporated into the stock, bones have also been classified as inedible parts.

Using the information described above, it was possible to determine which of the parts of items the UK public considered inedible parts for a range of items, not just those asked about in the survey. For items not asked about in the survey, a similar item was selected as a proxy where possible. For example, parsnip peel was considered similar enough to swede peel (i.e. the peel of a root vegetable, often cooked in a similar way and with a similar type of peel) to be used as a proxy.

Rules of thumb were developed to cover situations where no similar proxy was available or where it might not make sense to use one (Table 1). These rules were based on the purpose and use of the item. For example, used oil could have been from deep frying

(where the purpose of the oil had been fulfilled once used for frying). This case was then compared with similar use cases in the survey. In the example of used oil, it was classified as like oil drain from fish tins, which had been classed as inedible parts by the survey participants representing the UK public. This led to used oil being classified as an inedible part.

Table 1: Rules of thumb for determining inedible parts

Rule	Examples
Only a small amount of weight (mass) is extracted by processing/cooking	*Boiling bones (for stock), brewing tea leaves, unchewed gum*
Used as a storage medium for its primary purpose	*Brine, pickling vinegar, oil in fish tins*
Fulfilled its primary function before discarding	*Cooking oil, chewed gum*
Seasonal produce prepared in a specific way according to many recipes	*Outer leaves and ends of Brussels sprouts*

A full list of items considered food and associated inedible parts can be found in Appendix D.

While there have been other studies assessing cultural definitions of edibility, to the best of the authors' knowledge, this process has never been applied to food waste measurement in as comprehensive a manner as below. It is hoped that the method presented in this report could be reproduced – and possibly improved – so that it forms the basis of a standardised methodology that can be applied internationally. This would also allow comparison of cultural norms relating to 'edibility' in a range of countries.

2.1.4 Breakdown of items containing edible and inedible parts

When considering an item of waste that contained both edible and inedible parts, a method was needed to determine approximately how much of it should be assigned to each category. A hierarchy of sources was used to determine this. Each contains a percentage for the edible weight of a wide range of common foods:

A. Food Standards Agency. (2002). *McCance and Widdowson's The Composition of Foods, Sixth summary edition*. Cambridge: Royal Society of Chemistry.
B. Lynch, F.T. (2011). *The Book of Yields: Accuracy in Food Costing and Purchasing, Eighth edition*. Hobeken, New Jersey: Wiley.
C. US Department of Agriculture, Agricultural Research Service, Nutrient Data Laboratory. (2015). *USDA National Nutrient Database for Standard Reference. Release 28*. Slightly revised May 2016. [online] available at: https://www.ars.usda.gov/northeast-area/beltsville-md/beltsville-human-nutrition-research-center/nutrient-data-laboratory/docs/usda-national-nutrient-database-for-standard-reference/ [Accessed 11/12/2017]

Source A was used directly in 65% of decisions, B in 12% and C in 3%. In the remaining cases judgements were based on previous decisions or a composite of the sources where needed (e.g. calculating the amount of meat on a carcass as a percentage of its overall weight).

Where a meat or fish carcass was cited in the waste compositional analysis data, there was often accompanying data on approximately how much meat was still on that carcass. A calculation was applied based on the percentage of meat on the bone, the full weight of the animal pre-cooking and the weight of the bones of that animal. Corrections were not made for changes resulting from the cooking process.

Moving down the hierarchy was mostly a matter of availability of evidence in each source; if the first source did not have the item of food, the next was consulted. However, for certain items it was judged that the value in the first available source was not applicable to the instances of waste in question and should not be used. For example, source A gave a percentage edible for a peeled carrot. Since the survey suggested carrot peel is considered food, source B was used for the edible percentage of a whole carrot.

2.2 Methodology for 2007 and 2012

The rest of the methodology used to calculate results in 2007 and 2012 is the same as described in the Methods Annex of *Household Food and Drink Waste in the UK 2012*[17] (hereafter referred to as the "Methods Annex Report" and the "the original report" respectively for convenience). There are a few differences that have arisen from the reclassification of food waste categories to wasted food and inedible parts. Key points both on the specific parts of the overall methodology and on the differences from previous reports are drawn out in the summary below.

2.2.1 Sources of information

The 2007 estimates of household food and drink waste are derived from the following sources:

- **Synthesis of waste data:** unpublished estimate for 2007 applying the fraction of total waste that is food and drink from Defra's waste composition review[18] to WasteDataFlow information to obtain an estimate of household food and drink waste collected by local authorities.

- ***Detailed waste compositional analysis*[19]:** research commissioned by WRAP to quantify the weight and types of food and drink waste collected by 11 Local Authorities from areas covering over 2,000 households, conducted in 2007.

- ***Down the Drain*[20]:** use of diary keeping recording food waste discarded by sink or other routes to sewer. Research covered 300 participants and took place in 2008.

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[17] WRAP. (2013b). *Methods used for Household Food and Drink Waste in the UK 2012, Annex (v2).* [online] available at: http://www.wrap.org.uk/sites/files/wrap/Methods%20Annex%20Report%20v2.pdf.

[18] Defra. (2009). *Waste composition: A Review of Municipal Waste Component Analyses*. [online] available at: http://randd.defra.gov.uk/Default.aspx?Module=More&Location=None&ProjectID=15133.

[19] WRAP. (2008). Available on request. Superseded after additional sink and sewer research was conducted by, WRAP. (2009a). *Household Food and Drink Waste in the UK.* [online] available at: http://www.wrap.org.uk/sites/files/wrap/Household%20food%20and%20drink%20waste%20in%20the%20UK%20-%20report.pdf.

[20] *WRAP. (2009b). Down the Drain. [online] available at: http://www.wrap.org.uk/sites/files/wrap/Down%20the%20drain%20-%20report.pdf.*

- **Kitchen Diary 2007 research**[21]: use of diary keeping recording waste from all discard routes from the home (including poured down the kitchen sink or home composted). Diary keepers also recorded why each item was thrown away.

How these pieces of research are combined is detailed in Table 2. For each element of the results, the most appropriate source for that information has been used. The format continues in a subsequent table for the 2012 estimate.

Table 2: Summary of information used to obtain estimates of food waste for 2007

Discard route	Amount of food wasted	Type of food wasted	Reason for waste
Local authority collected waste	*Synthesis of waste data*	*Detailed waste compositional analysis*	*Kitchen Diary*
Household sewer e.g. kitchen sink	*Down the Drain*	*Down the Drain*	*Kitchen Diary*
Home composted	*Kitchen Diary*	*Kitchen Diary*	*Kitchen Diary*

The 2012 estimates of household food waste are derived from three main pieces of research:

- ***Synthesis of Food Waste Compositional Data 2012***[22]**:** collates information from waste audits commissioned by local authorities and waste data submitted to WasteDataFlow to obtain an estimate of household food waste collected by local authorities.

- **Detailed waste compositional analysis**[23]**:** research quantifying the weight and types of food waste from approximately 1,800 consenting households (conducted in 2013).

- **Kitchen Diary 2012 research**[24]: use of diary keeping recording waste from all discard routes from the home (including poured down the kitchen sink or home composted). Diary keepers also recorded why each item was thrown away.

Table 3: Summary of information used to obtain estimates of food waste for 2012

Discard route	Amount of food wasted	Type of food wasted	Reason for waste
Local authority collected waste	*Synthesis of Food Waste Compositional Data 2012*	Detailed waste compositional analysis	*Kitchen Diary 2012*
Household sewer e.g. kitchen sink	Derived from *Down the Drain*	Derived from *Down the Drain*	*Kitchen Diary 2012*
Home composted	*Kitchen Diary 2012*	*Kitchen Diary 2012*	*Kitchen Diary 2012*

[21] *WRAP. (2007). Unpublished.*
[22] *WRAP. (2013c). Synthesis of Food Waste Compositional Data. [online] available at: http://www.wrap.org.uk/sites/files/wrap/hhfdw-synthesis-food-waste-composition-data.pdf.*
[23] *WRAP. (2013). Unpublished.*
[24] *WRAP. (2012). Unpublished.*

Information on the estimates for UK household food waste in 2010, 2014 and 2015 is in section 2.3.

2.2.2 Discard routes of household food waste

For the purposes of this report, the following are classified as discard routes for household food waste, as illustrated in Figure 1:

- Waste streams collected by (or on behalf of) local authorities from households:
    - Residual waste collected at the kerbside (i.e. the general bin).
    - Collections by local authorities that target food waste (either separate food waste collections or mixed garden and food waste collections).
    - Contamination of 'dry' kerbside recycling collections (e.g. glass, paper).
    - Residual waste collected at household waste recycling centres.
- The sewer (mostly down the kitchen sink); and
- Home composting.

As mentioned above, food fed to animals is no longer considered as food waste.

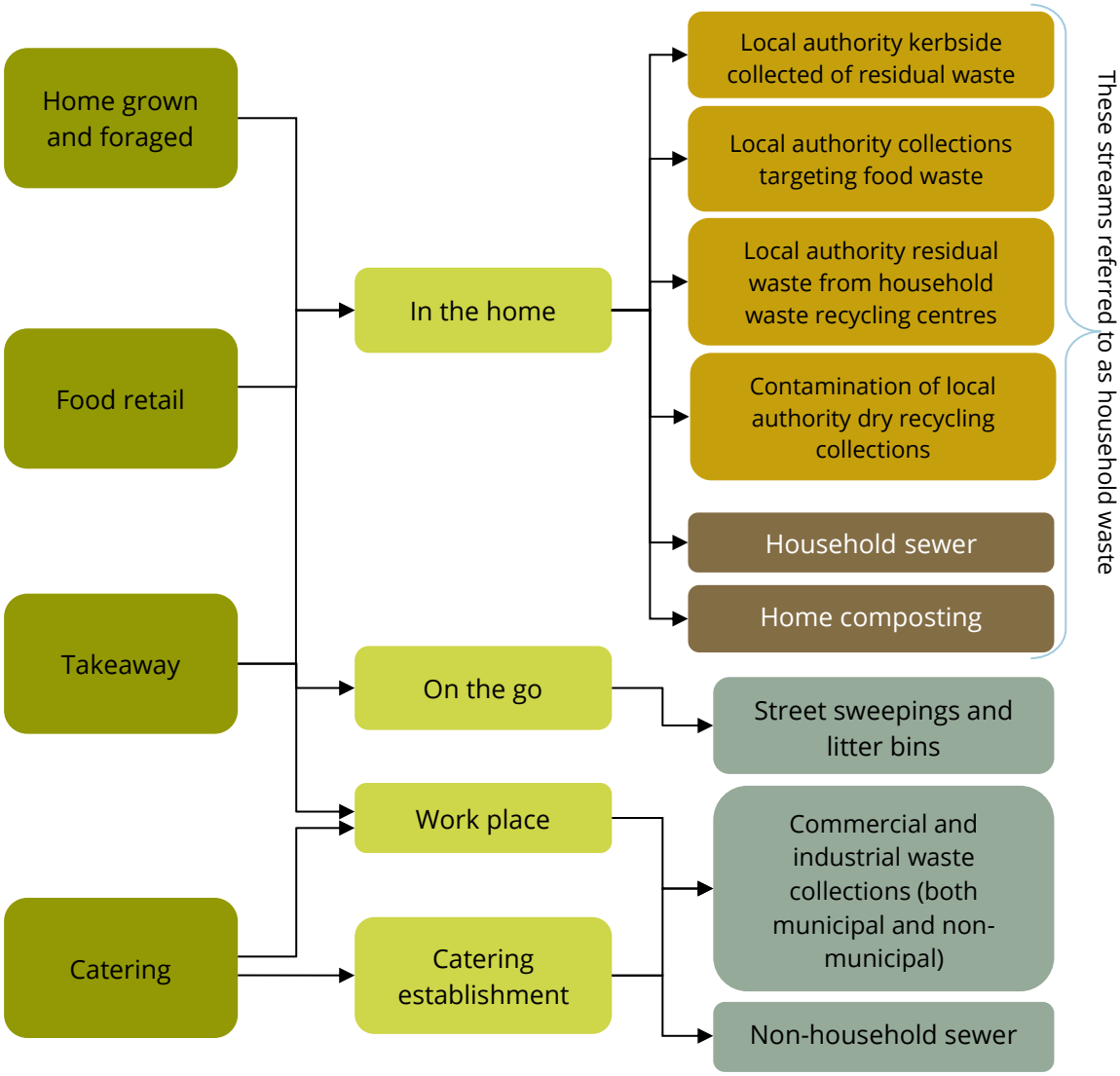
This definition means that food and drink is included in the estimates provided it enters the home: retail, takeaways, gifts and home-grown or foraged foods. Food waste discarded outside the home – via street sweepings and litter bins, commercial waste streams and commercial sewers – has been excluded from the estimates.

There may be some waste that comes into the home associated with consumption outside of the home (and vice versa), for example doggy bags from restaurants. However, it is likely that these latter flows are negligible in comparison to those in Figure 1, and, for this reason, an attempt to disaggregate them/quantify them has not been made for this report.

As with the research for the original report, an estimate of water added to food in the home is made for items thrown away via the sewer such as squash, tea and coffee. This quantity of water is excluded from the main estimates presented. In addition, adjustment has been made for seasonality in food waste arisings. More information on these methods can be found in Chapter 11 of the Methods Annex Report[25].

[25] *WRAP. (2013b). Methods used for Household Food and Drink Waste in the UK 2012, Annex Report (v2). [online] available at: http://www.wrap.org.uk/sites/files/wrap/Methods%20Annex%20Report%20v2.pdf.*

Figure 1: Schematic of major flows of food and drink and associated waste routes



Adapted and modified from *Household Food and Drink Waste in the UK 2012*

2.2.3 Reasons for discarding

Wasted food is classified into broad reasons according to why it was discarded. The information for classification is taken from the reasons given in the 2012 kitchen diaries. The broad reasons are listed below and are the same as used in previous reports:

- **Not used in time:** food that has been thrown away because it has gone off (mouldy, mushy or rotten) or because it has passed a date label (e.g. 'use by' or 'best before').
- **Cooked, prepared or served too much:** food and drink that has been cooked, prepared or served in the home and subsequently discarded. This category could also be referred to as 'leftovers'.
- **Personal preference:** food and drink not eaten due to allergies, other health reasons, wanting to feed animals with that food, or simply not wanting to eat this particular food or part of a food item.
- **Accidents:** food that has been contaminated, burnt or otherwise spoilt.
- **All other reasons:** e.g. cupboard clear out, dregs at the bottom of a cup.

The main change since *Household Food and Drink Waste in the UK 2012* is that some material previously classified as 'possibly avoidable' is now classified as food. These items were categorised according to the reasons for discarding, as stated in the diary.

2.2.4 Percentage of purchases that are wasted

Estimates have been made of the percentage of food brought into the home (mainly via purchases) that are thrown away. The data for food brought into the home comes from the Family Food datasets. The methodology is largely unchanged and more details can be found in *Methods Annex Report* Chapter 10[26]. The results are given in Section 4.3 of this report.

2.2.5 Cost of food waste

The cost of purchasing the food that becomes wasted food is estimated in Section 4.4. The methods used for estimating the cost of different food types are described in Chapter 8 of the *Methods Annex Report*[27], with a few minor improvements.

When the cost calculations were previously performed, cost data for 2012 was not available from the Family Food dataset. Data for 2011 was used, adjusted for inflation (CPI) between 2011 and 2012. This recalculation uses cost data for 2012 from the Family Food dataset. The costs of certain food categories where there were no available data in the 2012 report were also revisited, and data sources added where appropriate.

For the 163 food types covering wasted food, the restated 2012 price (calculated as above) varied by more than 10% from their previous values for 25 of the food types. Of those, 16 were increases, 2 decreases and 7 new values (and therefore notable increases).

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[26] *WRAP. (2013b). Methods used for Household Food and Drink Waste in the UK 2012, Annex Report (v2). [online] available at: http://www.wrap.org.uk/sites/files/wrap/Methods%20Annex%20Report%20v2.pdf.*

[27] *Ibid.*

Where there are changes in the weight of food as a result of processing in the home, for a given amount of food waste, the equivalent amount of food 'as purchased' was calculated. This was undertaken in a similar way to the original report. The weight of certain food types (e.g. pasta) changes substantially when cooked. Therefore, it was necessary to determine the amount of the wasted food that had been cooked after purchase for those types. The method for determining this has been updated for this report.

In the original report, the method used to determine if an item was cooked after purchase was derived from the food waste diary data. If the reason for discarding an item was "cooked, prepared or served too much", the item was considered cooked. For this report, it was decided that the waste compositional analysis data would give a more accurate estimate. Therefore, the weight of waste that had been coded as "cooked at home" or "cooked from an unknown source" (i.e. uncooked when purchased) in the waste compositional analysis data was used to determine the proportion of cooked food waste for a given food type.

A further change concerned accounting for the weight of inedible parts in the costs used to calculate the price of wasted food. In the original report, the cost of 100g of an item was directly applied to the weight of the food waste as it would have been when purchased. This was largely consistent with how whole items were classified using the 'avoidability' classification. However, whole items are now split into food and their inedible parts, and the cost needs to be allocated to the wasted food only.

For this recalculation, it was assumed that the price of a whole item is for the food only (e.g. the flesh). This implies that there is negligible value attached to the inedible part (e.g. the bone). This reflects the fact that most people do not use the inedible part; indeed, there is usually a cost associated with collecting and processing this waste (either to the household, the local authority or the water treatment company).

Given the above, the price of a food type was divided (per 100 grammes as purchased) by the percentage of that food type that is wasted food (using percentages derived from the process described in Section 2.1.4). This gave the price per 100 grammes of wasted food and led to costs of a further 35 types of food increasing by more than 5%. This price of food (per 100 grammes of wasted food) was then multiplied by the weight of the wasted food (as purchased) to give the total price of wasted food.

2.2.6 Environmental impact of food waste

The methodology for calculating the greenhouse gas emissions associated with food waste is presented in Chapter 9 of the *Methods Annex Report*[28] and the estimate for the environmental burden associated with wasted food is presented in Section 4.5. The emissions cover the relevant elements of the life-cycle of food and drink including: agriculture, manufacture, packaging, distribution, retail, transport to the home, storage and preparation in the home, and waste treatment and disposal. An assessment has also been made of the amount of land required to produce the food wasted by UK

[28] *WRAP. (2013b). Methods used for Household Food and Drink Waste in the UK 2012, Annex Report (v2). [online] available at: http://www.wrap.org.uk/sites/files/wrap/Methods%20Annex%20Report%20v2.pdf.*

households. No changes were made to the method other than calculating the impact for the weight of wasted food (i.e. edible parts) rather than, as was previously done, avoidable waste.

In addition to the greenhouse gas emissions, there are other environmental impacts and resource issues relating to food and drink waste including water use, eutrophication of water bodies, and depletion of soils. These have not been calculated as part of this report. However, the information on the different types of food and drink wasted in the UK could be used as the basis for such a calculation. In a similar manner, a calculation on the nutrients, including energy, within the food waste could also be made.

2.3 Methodology for 2010, 2014 and 2015

This section describes the methods used for estimating HHFW in 2010, 2014 and 2015: i.e. years for which there is data about local-authority-collected HHFW from studies synthesising existing local-authority data, but for which there is an absence of detailed waste compositional studies or kitchen-diary research. The methods used are similar to those previously used in WRAP (2017)[29].

Similar to 2007 and 2012, the amount of HHFW collected by local authorities (in residual waste, collections targeting food waste and contamination of dry recycling) comes from 'synthesis' studies, as outlined in the WRAP 2017 report. This element is consistent with estimates for 2007 and 2012.

However, there is less information for discarding to sewer and home composting. For sewer waste, estimates for 2010, 2014 and 2015 have been calculated using the same method used for 2012 and outlined in *Methods Annex Report*[30]. The original data source was kitchen diaries, in which participants recorded the amount of food and drink discarded down the drain. For these years, it was assumed that the amount of food waste going down the sewer changed in line with the trends seen in food waste within waste streams collected by local authorities (residual and any collections targeting food waste). This assumes that the trends in the amount of food waste are similar for foods commonly being collected by local authorities compared to foods that are usually discarded down the sewer. It also assumes that there has been no substantial shift favouring one discard route over the other.

Home composting is a relatively minor route for discarding food waste. For 2014 and 2015, it was assumed that the same amount per person of food waste went to home composting as in 2012 (8.0 kg / person / year). The 2012 estimate is based on kitchen diaries from that year, research that involved 948 households. As discussed in the WRAP 2017 report, there has been no evidence of change in the amount going to home composting. For 2010, a linear interpolation was used between the estimate for 2007 and 2012. This resulted in an estimate of 7.9 kg / person / year.

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[29] WRAP. (2017). *Household Food Waste in the UK, 2015,* Appendix A. [online] available at: http://www.wrap.org.uk/sites/files/wrap/Household_food_waste_in_the_UK_2015_Report.pdf

[30] *See* Sections 2.3 and 3.2 of WRAP. (2013b). *Methods used for Household Food and Drink Waste in the UK 2012*. [online] available at: http://www.wrap.org.uk/sites/files/wrap/Methods%20Annex%20Report%20v2.pdf.

There is no data for 2010, 2014 or 2015 on the proportion of HHFW that is wasted food (i.e. edible parts). However, total levels of HHFW were similar in 2012, 2014 and 2015 on a per person basis. Therefore, the 2014 and 2015 estimates of household food waste assume that the amount of discarded inedible parts *per person* remained constant (at 31.7 kg / person / year), leading to an increasing *total* amount of inedible parts discarded reflecting population growth. For 2010, a linear interpolation between 2007 and 2012 was used resulting in an estimate for discarded inedible parts of 31.8 kg / person / year in 2010.

2.4 Notes on reporting information

Information for an individual food group is presented in Chapter 5.0. The chapter is ordered by each group's contribution to the total amount of food waste, starting with the highest, namely vegetables and salad. Section 5.8 includes the food groups with minor contributions to the total. The chapters on vegetables and salad (Section 5.1) and fruit (Section 5.3) contain a combined analysis of both fresh and processed items.

Not all food and drink types are reported separately. Where the estimate for a food type is of relatively poor precision[31], the amount of waste is added to a category named, for example, 'all other bakery'. The food types that are not reported separately are highlighted in the first table of Sections 5.1 to 5.8. As they are included in an 'all other …' category, this process has no effect on the total waste reported for each food group, or the headline results.

Given the uncertainty around estimates of the waste of individual food groups and food types, information in the following chapters is reported to two significant figures. For estimates where the relative error is close to the threshold for inclusions, these estimates are more uncertain than the two significant figures imply. For brevity, most results are reported without an associated confidence interval; however, the *Methods Annex Report*[32] presents confidence intervals for the key results. In tables and figures reporting food waste, the sum of certain columns can be inconsistent with the total quoted in the final row; this is due to rounding. Likewise, for certain rows where the total quoted in the final column is inconsistent with the sum of that row.

All amounts of less than 1,000 tonnes have been denoted as '<1,000' in the tables. This includes categories for which no waste was found in the research; given that the surveys covered a sample of households – rather than all households in the UK – absence from the survey does not necessarily imply that the arisings in the UK are zero, only that they are likely to be low.

For costs of wasted food of less than £1 million in tables of reasons for discarding food, the expression '<£1' (million) has been used. This includes reasons that were not mentioned in the diary research. As above, given that the diaries covered a sample of

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[31] Food types are included if the confidence intervals in both this report and the previous report (Household Food and Drink Waste in the UK) were less than 40% of the respective estimate (i.e. for a food type with an estimate of 100,000 tonnes, it was reported separately if the confidence interval was less than ±40,000 tonnes). This criterion for inclusion of a food type is discussed further in the Methods Annex Report (Section 13.3).

[32] WRAP. (2013b). Methods used for Household Food and Drink Waste in the UK 2012, Annex Report (v2). [online] available at: http://www.wrap.org.uk/sites/files/wrap/Methods%20Annex%20Report%20v2.pdf.

households – rather than all households in the UK – absence from the diary does not necessarily imply that the waste arising for that reason in the UK is zero, only that it is likely to be low.

3.0 Results – changes due to restating

This section outlines some of the major differences between previously published results and those in this report – i.e. those that have been restated.

3.1 Total arisings

The total amount of UK household food waste is slightly lower after restating than before. For instance, in 2015, the amount of food waste previously reported[33] was 7.3 million tonnes; after restating it was 7.1 million tonnes. The difference is due to the omission of food (originally purchased for human consumption) that is fed to animals (280,000 tonnes in total).

The omission of food that is fed to animals impacts the food groups differently. Two-thirds of the food fed to animals is in three categories: bakery, meat and fish, and fresh vegetables and salad. This explains the lower figures in each of these categories.

Table 4 shows the effect that restating the totals has had on the change in total food waste generated by UK households between 2007 and 2015.

Table 4: Total food waste and avoidable food waste/wasted food (edible parts) in 2007 and 2015 before and after restating

	Previous				Restated			
	Weight			% change	Weight			% change
	2007	2015	Change		2007	2015	Change	
UK total (million tonnes)								
Avoidable food waste/wasted food (edible parts)	5.3	4.4	-0.9	-17%	6.1	5.0	-1.1	-18%
Total food waste	8.3	7.3	-1.0	-12%	8.1	7.1	-1.0	-13%
Per capital (kg)								
Avoidable food waste/wasted food (edible parts)	88	68	-19	-22%	100	77	-23	-23%
Total food waste	136	113	-23	-17%	132	108	-24	-18%

[33] WRAP. (2017). *Household Food Waste in the UK, 2015*. [online] available at: http://www.wrap.org.uk/sites/files/wrap/Household_food_waste_in_the_UK_2015_Report.pdf.

3.2 Discard routes

Given the omission of food fed to animals, the proportions of the total food waste going to the other discard routes increased slightly. The percentages for 2015 are:

- local authority collected food waste accounted for 69%, which is made up of residual (58%), collections targeting food waste (9%) and other (2%);
- sewer disposal 23%;
- home composting 7%.

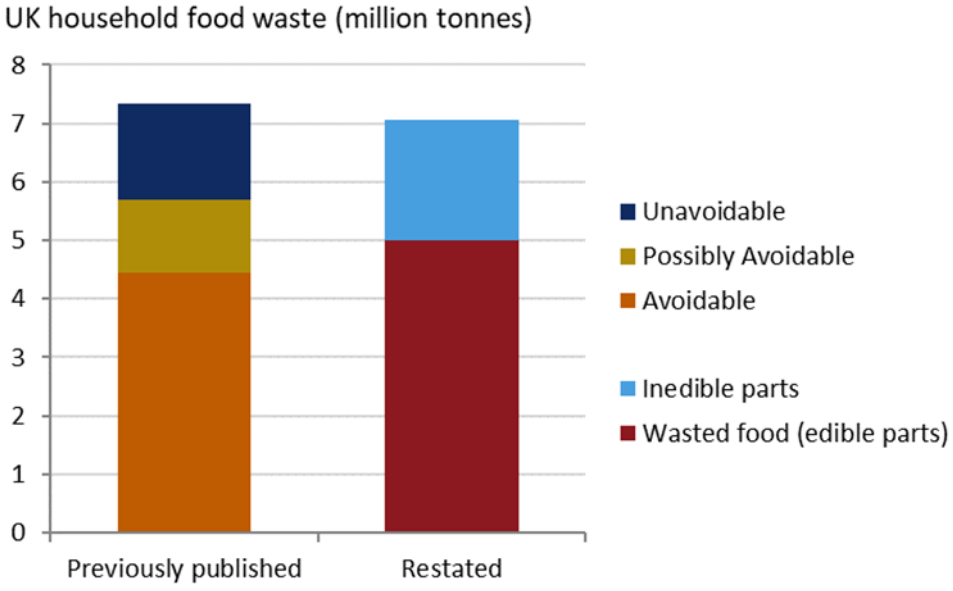
3.3 Classification – food and inedible parts

The biggest change associated with restating food-waste data focuses on the classification of edible and inedible parts. The new classification uses two categories, replacing the method based on avoidability (three categories).

A comparison of the results is shown in Figure 2. The amount of wasted food is greater than the previously stated amount of avoidable food waste because some items found in possibly avoidable food waste are now classified as food. Two notable examples are:

- Bread (both standard and speciality), in which crusts and end slices are classified as food (i.e. edible parts); previously they were classified as possibly avoidable.
- Fresh potatoes, where the whole potato is classified as food (i.e. edible); prior to restating, the skin / peel was also classified as possibly avoidable.

Figure 2: Comparison of household food waste in the UK for 2015, as previously published and restated (tonnes)



However, the amount of wasted food is less than the sum of avoidable and possibly avoidable food waste. This is for two main reasons:

- Some possibly avoidable waste was classified as inedible parts, most notably drainings from cans of food (e.g. tins of fish) and semi-solid waste, which is made up of waste in the waste compositional analysis that was 'unpickable', including heavily decomposed food and semi-solid waste from meals.
- Items containing food and inedible parts are now split into the two categories, whereas previously they were classified according to the majority part (usually avoidable). This has had a substantial effect for many items, most notably those

in the fresh vegetables and salad, fresh fruit, and meat and fish categories. In general, the weight of inedible parts is higher than the unavoidable food waste prior to restating. Examples are given in Table 5.

Table 5: Examples of food types where splitting whole items into fractions of food and inedible parts has influenced the results

Food type	Split prior to restating			New split	
	Avoidable	Possibly avoidable	Unavoidable	Wasted food	Inedible parts
Banana	22%	-	78%	15%	85%
Melon	31%	-	69%	22%	78%
Orange	41%	-	59%	30%	70%
Pepper	50%	-	50%	45%	55%
Poultry	38%	8%	54%	40%	60%
Pork / ham / bacon	70%	14%	16%	82%	18%
Fish & shellfish	82%	5%	13%	72%	28%

3.4 Estimates of cost and environmental impact

Previously, the estimates for the amount of money spent on food that becomes wasted and the environmental impact of food waste were calculated for avoidable food waste. For the restated estimates, these are now calculated for wasted food. As the amount of wasted food is greater than the amount of avoidable food waste, the estimates for cost and environmental impact have also increased.

For example, the restated total cost of household food waste in the UK in 2015 was £14.9 billion compared to £13.0 billion as previously published. Similarly, the greenhouse gas emissions associated with UK HHFW in 2015 are estimated at 22 million tonnes CO_2 eq., compared to the previous figure of 19 million tonnes CO_2 eq.

3.5 Reasons for discarding

One result of changing the classification method for food waste is that there is now more food waste classified as discarded due to personal preference. This is due to items previously classified as possibly avoidable that are now classified as food; for most of these, the reason for discarding given in the kitchen diaries was related to personal preference.

Before restating, personal preference was the third most important reason why food was thrown away and accounted for 14% of avoidable food waste by weight; it is now second, accounting for 28% of wasted food. Food wasted because it was not used in time was still the largest proportion by weight (41%).

3.6 Practical considerations for prioritisation

This work raises the question of whether those attempting to influence the amount of household food waste in the UK should do anything differently considering the restated results. To help answer this question regarding what foods to focus on, a comparison of the top 20 food types by weight is presented in Figure 3. This compares the avoidable HHFW as previously published with the wasted food of the recalculated figures.

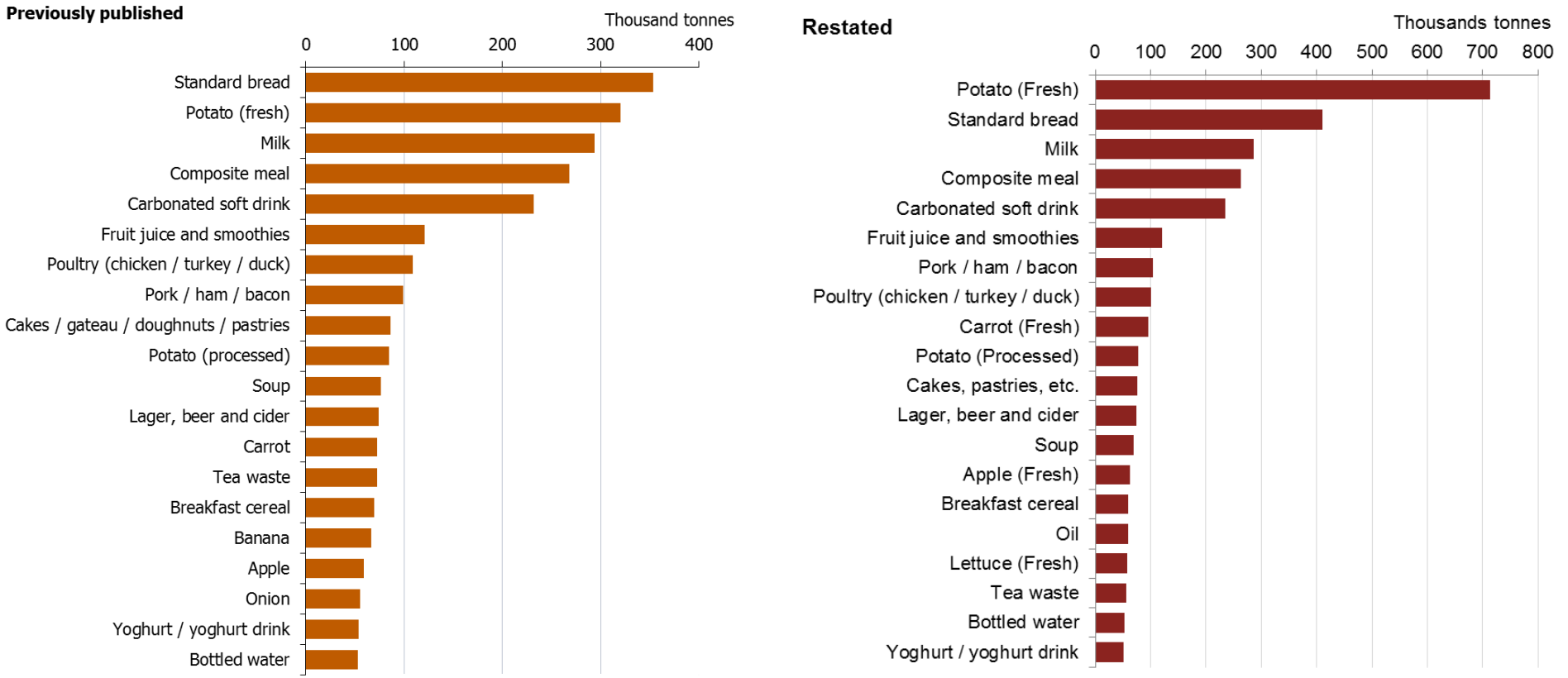
This comparison shows remarkable similarity between the items found in each top 20. Only two food types in the original top 20 are no longer present – bananas and onions, mainly due to the way in which whole items comprising food and inedible parts are treated in the analysis. These are replaced by oil and lettuce, both of which have had possibly avoidable material reclassified as food.

Some items have changed position – fresh potatoes are now the number one item by weight, due to the reclassification of potato skin / peel from possibly avoidable to wasted food. It is now the number one food type by some margin. For a similar reason, carrots have also moved up from 13th position to 9th.

Weight is not the only metric that should be used to prioritise food waste – cost, environmental impact and nutritional value may also be useful to take into account, depending on the circumstances. However, these are calculated from weight data which remain the primary metric of interest.

This analysis shows that priority food types have remained largely unchanged as a result of this restating process. However, the change relating to reasons for discarding suggests that people's decision-making around rejecting food that they do not like is more important than previous WRAP research suggested. This is a challenging area to tackle but potentially warrants more attention in the future.

Figure 3: Comparison of top 20 food types wasted by weight, left = avoidable food waste (previously published), right = wasted food (restated)



4.0 Detailed Results

This chapter describes the restated estimates for UK household food waste. It starts with the total amount of food waste, focusing on trends over time. This includes information on the discard routes from the home and how much of the material is food, as opposed to inedible parts associated with food. This is followed by detailed results for each food group.

As described in Section 2.4, some figures in this chapter are not rounded to 2 significant figures like the rest of the report. There are also occasions where the rounding convention leads to totals that are different from the sum of their parts as written.

4.1 Total household food waste in the UK

There was a substantial reduction in HHFW from 8.1 million tonnes in 2007 to 6.8 million tonnes in 2010 (Figure 4), as previously reported by WRAP. Thereafter, levels of HHFW have not varied substantially. The restated estimate of HHFW for 2015 is 7.1 million tonnes.

These figures are all slightly lower than previously published due to the omission of food fed to animals. Approximately 200,000 to 300,000 tonnes of food and associated inedible parts is fed to animals from UK households each year.

The estimate of the amount of wasted food has also declined from 6.1 million tonnes in 2007 (76% of the total) to 4.9 million tonnes in 2010 (71%). By 2015, the estimated amount of wasted food generated by UK households was 5.0 million tonnes (still 71%).

Figure 4: Total household food waste in the UK, 2007-2015, split by edibility (tonnes)

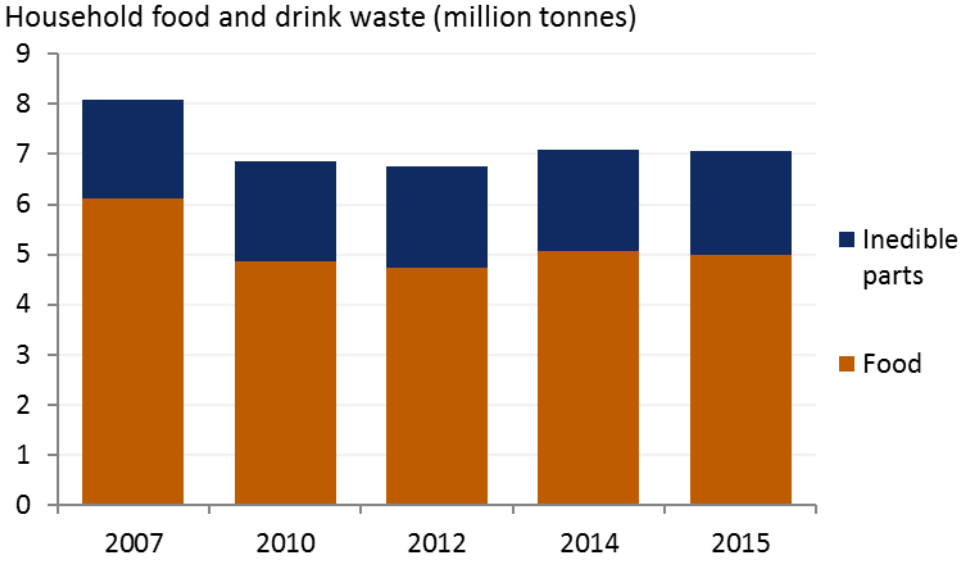


Figure 5 shows the same information expressed as the average amount of HHFW per person per year. In 2015, the average amount of HHFW was 108 kg per year, compared to 132 kg per year in 2007, a reduction of 18%. This is a greater percentage reduction than for the total amount of HHFW, as the population of the UK increased by approximately 6% over this time period. In 2015, 77 kg/person/year of HHFW was food

and 32 kg/person/year was associated inedible parts. This information can also be found in Table 6.

Figure 5: Average amount per person of HHFW in the UK, 2007-2015, split by edibility

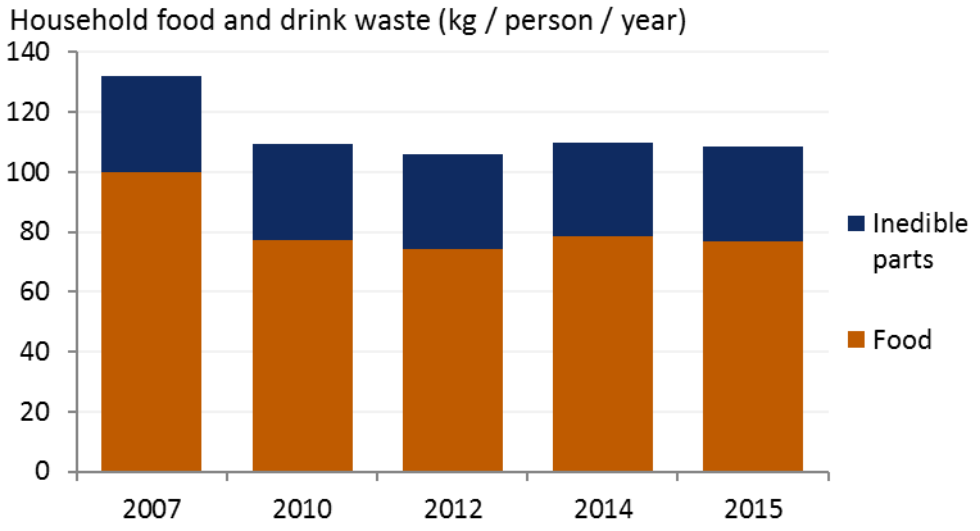


Table 6: Estimates of HHFW from 2007 to 2015, million tonnes and kg / person / year

	2007	2010	2012	2014	2015
Total (million tonnes)					
Wasted Food	*6.1*	*4.9*	*4.7*	*5.1*	*5.0*
Inedible Parts	*2.0*	*2.0*	*2.0*	*2.0*	*2.1*
HHFW Total	**8.1**	**6.8**	**6.7**	**7.1**	**7.1**
Average (kg / person / year)					
Wasted Food	*100*	*77*	*74*	*78*	*77*
Inedible Parts	*32*	*32*	*32*	*32*	*32*
HHFW Total	**132**	**109**	**106**	**110**	**108**

The sum of certain columns is inconsistent with the total quoted in the final row due to rounding.

Figure 6 and Figure 7 show the same data, split by the route by which it leaves the home (the discard route). This shows that, for all years, the amount collected by local authorities (LAs) – including residual waste and collections targeting food waste – were the largest proportion. In 2015, these routes accounted for 69%, which is made up of residual (58%), collections targeting food waste (9%), and other (2%). The remaining food waste was split between discarding to the sewer/down the drain (23%) and home composting (7%).

The largest contribution to the reduction in household food waste between 2007 and 2010 was from that collected by LAs (Table 7).

Figure 6: Total household food and drink waste in the UK, 2007-2015, split by discard route (tonnes)

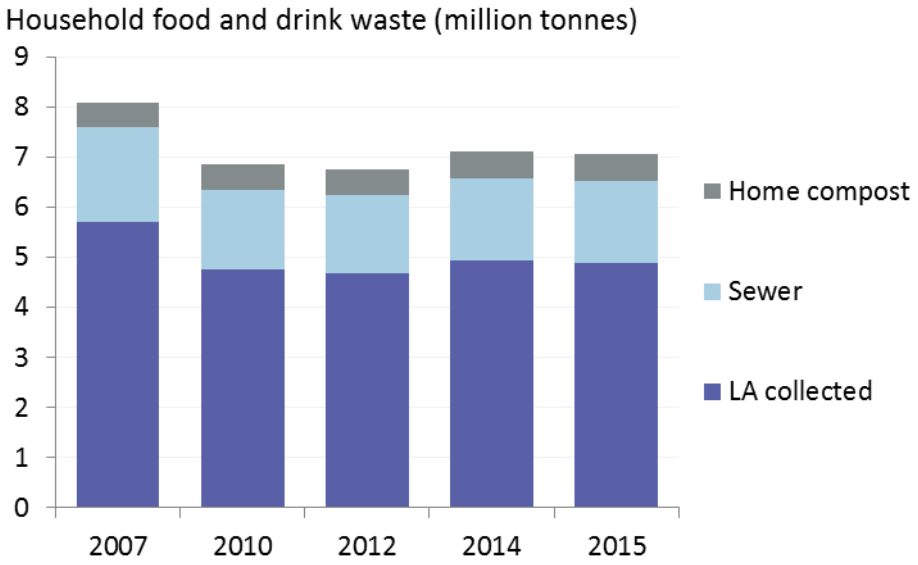


Figure 7: Average amount per person of HHFW in the UK, 2007-2015, split by discard route

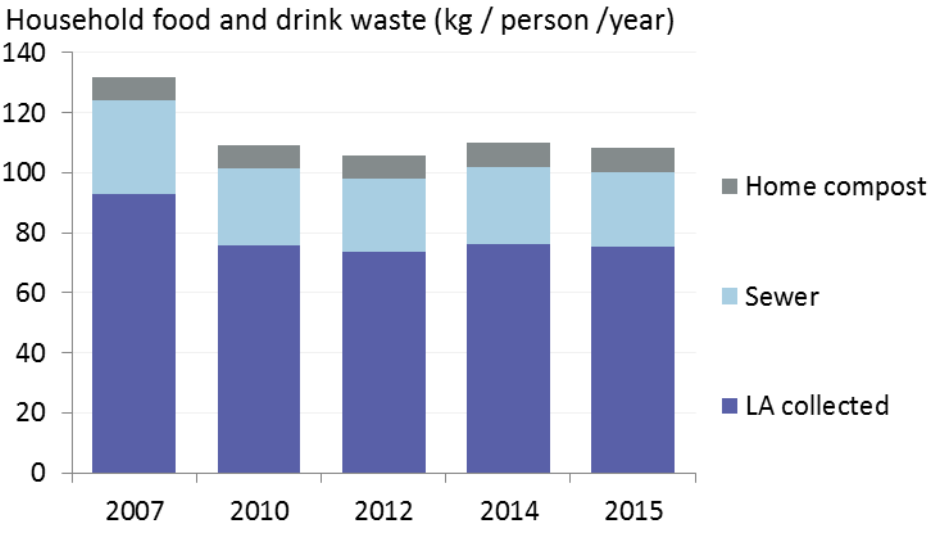


Table 7: Estimates of HHFW from 2007 to 2015, split by discard route, million tonnes and kg / person / year

	2007	2010	2012	2014	2015
Total (million tonnes)					
LA collected	5.7	4.8	4.7	4.9	4.9
Sewer	1.9	1.6	1.6	1.6	1.6
Home compost	0.48	0.50	0.51	0.51	0.52
HHFW Total	**8.1**	**6.8**	**6.7**	**7.1**	**7.1**
Average (kg / person / year)					
LA collected	93	76	73	76	75
Sewer	31	25	25	26	25
Home compost	7.9	7.9	8.0	8.0	8.0
HHFW Total	**132**	**109**	**106**	**110**	**108**

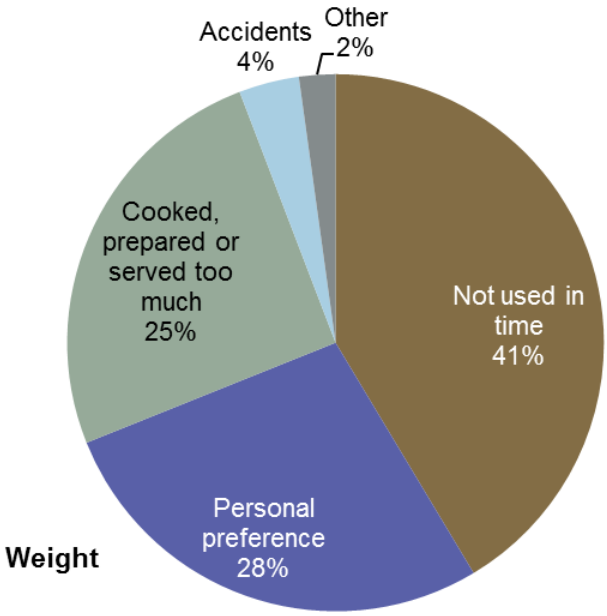
4.2 Reasons for discarding (2012)

Food wasted by households was further subdivided by the reason for discarding as stated in the *Kitchen Diary 2012* research[34].

By weight, 41% of food wasted by households in 2012 was classified as 'not used in time': thrown away because it had either gone off or passed the date on the packaging (Figure 8). A further 28% was linked to personal preferences including health reasons and not liking certain foods. 25% was classified as 'cooked, prepared or served too much': this included food and drink that had been left over after preparation or serving. Accidents – including food dropped on the floor and failure of a freezer – accounted for 4%.

[34] *WRAP. (2012). Unpublished.*

Figure 8: Proportion of 2012 wasted food from households split by reasons for discarding, by weight



By cost, the figures are similar – not used in time accounts for 43% of the cost of foods purchased but not eaten. However, cooked, prepared or served too much (26%) accounts for a larger proportion of the total cost of HHFW than personal preference (25%).

Figure 9: Proportion of 2012 wasted food from households split by reasons for discarding, by cost

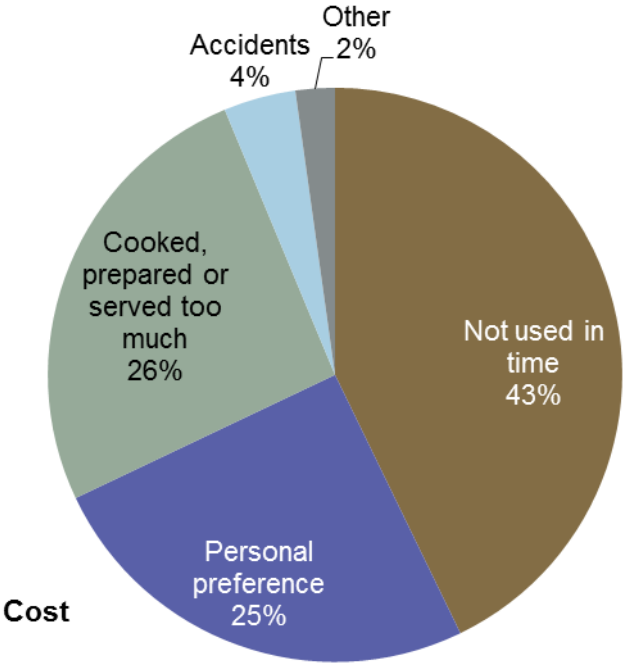


Table 8: Breakdown of wasted food from households by reason for discarding in 2012, by weight and cost

Metric	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Weight (tonnes)	2,000,000	1,300,000	1,200,000	170,000	100,000
Cost (£ million)	£6,000	£3,500	£3,600	£570	£310

4.3 Proportions of purchases wasted (2012)

This section presents results on the proportion of purchases that became waste in 2012. This involves calculating the equivalent amount of purchases for given types of waste, where possible taking into account changes that occur in the home to food.

Table 9 shows these results at a headline level, illustrating that approximately 35.8 million tonnes of food and drink are purchased each year[35] and the equivalent of 17.7% of these purchases end up as waste. This is made up of food (13.3%) and inedible parts (4.4%) food waste.

Table 9: Proportion of purchases becoming waste (2012)

	Weight (tonnes)	% of purchases
Purchases	35,800,000	100.0%
Waste (equivalent purchases):		
Food	4,751,000	13.3%
Inedible parts	1,579,000	4.4%
Total waste	6,300,000[36]	17.7%

As found in previous analyses, the proportion of food wasted (excluding drink; Table 10) was slightly higher than for all food and drink (Table 9). For waste from just food (excluding drinks), the total waste represented 20.5% of purchases, with wasted food accounting for 15.1% of purchases. For drink alone, 8.5% of purchases became waste: 7.2% 'food' and 1.3% 'inedible parts'.

[35] *This figure is using a different method to that found on page 60 of Methods used for Household Food and Drink Waste in the UK 2012. The main difference between these two figures is that previously the diluted weight of concentrated drinks was used; for the current estimate, the undiluted (as purchased) weight of these drinks is quoted. The figure here is consistent with Household Food and Drink Waste: A product focus.*

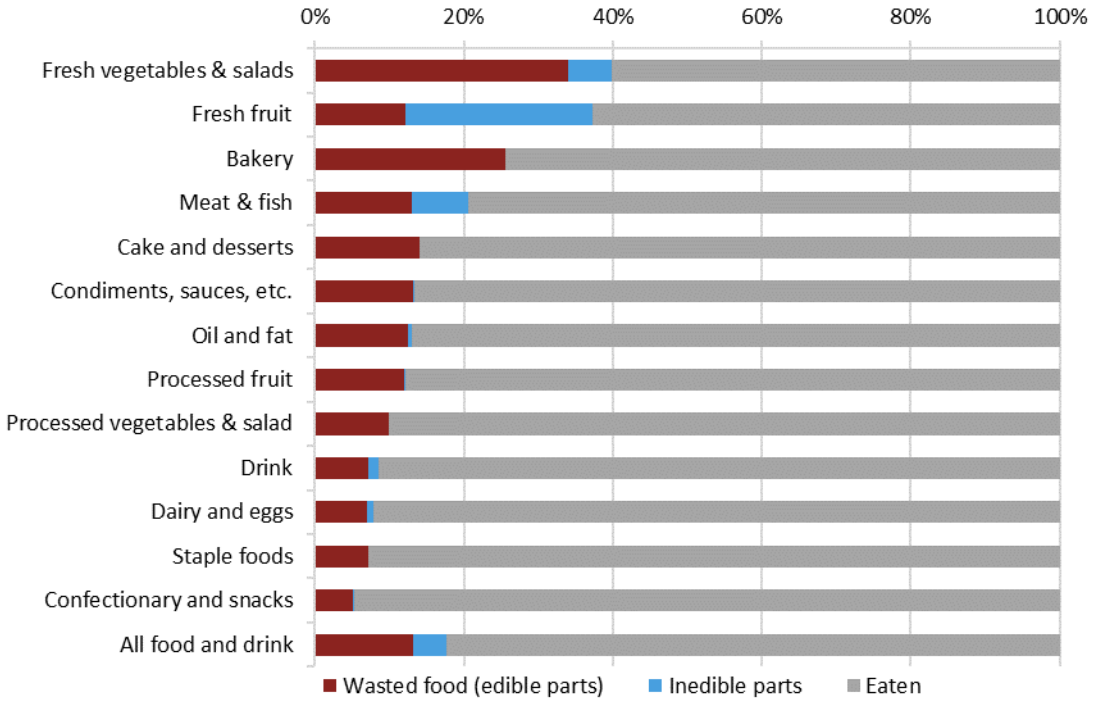
[36] *As stated in Section 2.2.4, the weight of certain food changes when cooked and the figure here is for the equivalent weight of that wasted food when it was purchased, hence the discrepancy from the total waste figure given in other sections.*

Table 10: Proportion of food only purchases becoming waste (2012)

	Weight (tonnes)	% of purchases
Purchases	27,400,000	100%
Waste (equivalent purchases):		
Wasted food	4,140,000	15.1%
Inedible parts	1,470,000	5.4%
Total waste	5,610,000	20.5%

The proportion of purchases wasted varied considerably by food group (Figure 10). For instance, 40% of fresh vegetable and salad purchases were thrown away, with 34% of purchases becoming wasted food. In contrast, only 5% of confectionery was not eaten.

Figure 10: Proportion of purchases wasted by weight for different food groups, showing edibility of the waste (2012)



Note – Results for 'meals' and 'other' are strongly influenced by changes to food in the home and are omitted; some of the estimates may be slight over- or under-estimates; see Section 5.1.2 of HHFDW: A Product Focus for more details.

The above estimates contained in figures and tables are for 2012 as stated, using a bottom up approach to calculation for each food type based on detailed waste data. Data required to carry out the equivalent analysis for 2015 is unavailable.

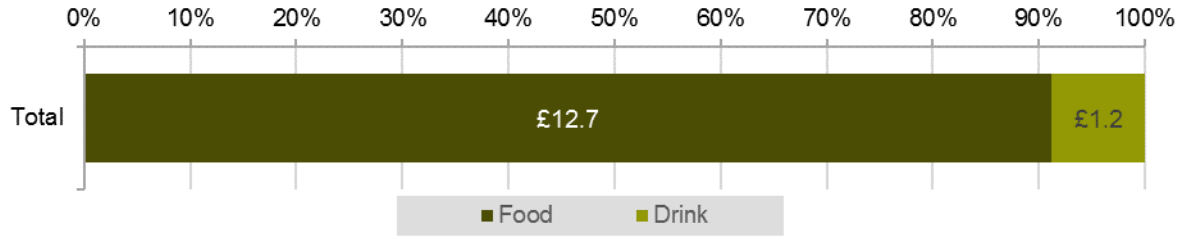
4.4 Cost of food waste

The cost to households of wasted food has been estimated from food prices for 2012, i.e. the cost to purchase food that was subsequently thrown away. It does not include the cost associated with preparing food and drink in the home (e.g. gas or electricity for cooking), travelling to and from the supermarket, or disposal costs incurred by local

authorities. The cost was only calculated for wasted food and drink as it is assumed that there is no cost to consumers for inedible parts of food.

The total financial cost of wasted food and drink to householders in 2012 was £14.0 billion (to three significant figures[37]), or £520 per household or £220 per person. For the average family, it was £770. This wasted food represents 17% of expenditure on food and drink brought into the home.

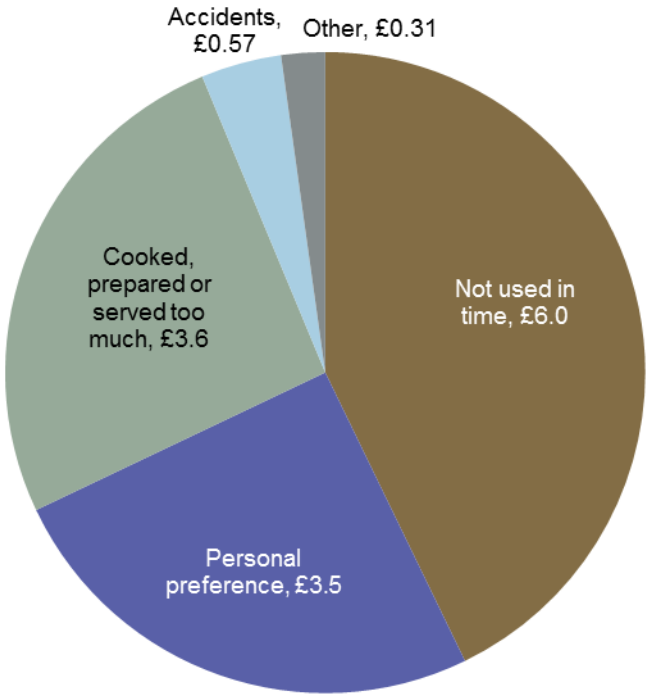
Figure 11: Cost of wasted food, split by food and drink (£ billion)



Figures within bars state waste in £ billions

Around 90% of the cost of wasted food and drink was associated with food only, as opposed to drink (Figure 11). Of the wasted food and drink, £6.0 billion was associated with material not used in time, £3.6 billion with leftover food (cooked, prepared or served too much) and £3.5 with personal preference (Figure 12).

Figure 12: Cost of food and drink wasted by households, by reason for discarding (£ billion)



[37] *This cost is presented to 3 significant figures, different from the convention of 2 significant figures used for the other figures in this report (to ensure comparability with the Executive Summary and other related materials where the headline estimate is and has been used).*

The cost of HHFW was also calculated for 2015 for all wasted food. The restated total cost of household food waste in the UK in 2015 was £14.9 billion (compared to £13.0 billion as previously published). This equates to £230 per person, £540 per household and £810 per family.

4.5 Environmental impact

The greenhouse gas emissions associated with wasted food and drink in the UK accounted for approximately 19 million tonnes of CO_2 equivalent in 2012. In 2015, they accounted for approximately 22 million tonnes of CO_2 equivalent mostly due to a change in the carbon factor used[38]. The figures include contributions from the relevant elements of the food and drink system: agriculture, manufacture, packaging, distribution, retail, transport to the home, storage and preparation in the home, and waste treatment and disposal[39].

To put the figures in context, the total greenhouse gas emissions relating to consumption in the UK (as opposed to emissions produced within the geographical bounds of the UK) amounted to around 854 million tonnes in 2012[40]. Thus, food and drink wasted by households accounted for approximately 2% of this total.

Land is required both in the UK and abroad to produce the edible food and drink that is subsequently thrown away by UK households. An estimate has been made of these land requirements for wasted food in 2012: 19,000 square kilometres or an area about 90% the size of Wales.

The use of this land to generate food that is wasted increases demand for agricultural land worldwide, which can indirectly cause deforestation and other land-use changes. If the impact of this indirect land-use change on greenhouse gas emissions is considered, the estimates for greenhouse gas emissions associated with household food waste in 2012 increases from 19 million tonnes to 25 million tonnes of CO_2 equivalent.

As with 2015 estimates of wasted food as percentage of purchases, it is better to use 2012 estimates for requirement of and emissions associated with land used to produce food that is wasted; 2012 is the most recent granular food waste data available.

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[38] For the 2015 calculations, a top down calculation of greenhouse gas emissions per tonne of wasted food was used to avoid operating on the assumption that the proportions of waste for each food type and category had not changed between 2012 and 2015. In 2012, a bottom up calculation was made for the greenhouse gas generated from each food type. However, since it has been observed in previous calculations that a top down calculation results in a larger estimate than a bottom up calculation, the 2012 and 2015 environmental impact figures are not comparable.

[39] Details on how the greenhouse gas emissions are calculated are in Chapter 9 of the Methods Annex Report: WRAP. (2013b). Methods used for Household Food and Drink Waste in the UK 2012, Annex Report (v2). [online] available at: http://www.wrap.org.uk/sites/files/wrap/Methods%20Annex%20Report%20v2.pdf.

[40] Defra. (2012, updated 2017). *UK's Carbon Footprint 1997 to 2014*. [online] available at: https://www.gov.uk/government/statistics/uks-carbon-footprint.

5.0 2012 results for each food group (ordered by amount of total food waste or wasted food)

This chapter presents detailed estimates for amounts of waste produced of different food types and groups by UK households in 2012.

For detail on what each food group comprises, please refer to the original report[41] (Chapter 5) and Appendix D of this report.

As mentioned above, in tables and figures reporting food waste, the sum of certain columns can be inconsistent with the total quoted in the final row, likewise the sum of certain rows. This is due to the rounding convention adopted.

Table 11 shows the breakdown of food waste and the cost of wasted food per group.

Table 11: Food waste in 2012 by group, split by wasted food / inedible parts and the cost of wasted food

Food Type	Weight generated (tonnes)			Wasted food (£ million)
	Wasted food (edible parts)	Inedible parts	Total food waste	
Fresh vegetables and salads	1,300,000	230,000	1,600,000	£2,700
Drink	700,000	540,000	1,200,000	£1,200
Fresh fruit	300,000	620,000	920,000	£1,100
Meat and fish	300,000	210,000	510,000	£2,600
Bakery	500,000	<1,000	500,000	£870
Dairy and eggs	410,000	59,000	470,000	£750
Meals (home-made and pre-prepared)	420,000	<1,000	420,000	£1,800
All other food and drink	780,000	360,000	1,100,000	£2,900
Total food and drink	**4,700,000**	**2,000,000**	**6,700,000**	**£14,000**

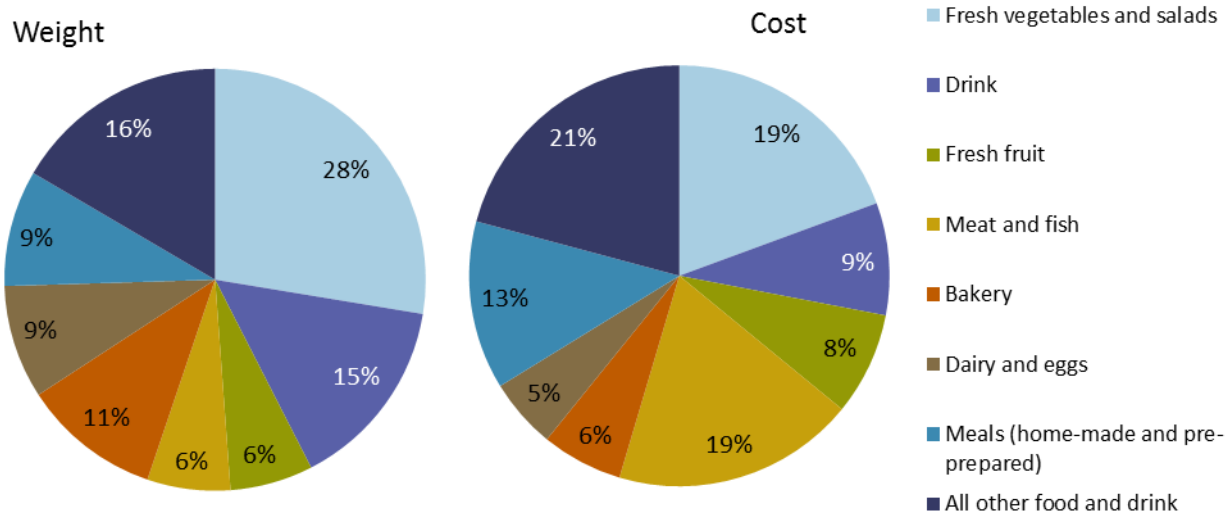
[41] *As above:* WRAP. (2013a). *Household Food and Drink Waste in the United Kingdom 2012*. [online] available at: http://www.wrap.org.uk/sites/files/wrap/hhfdw-2012-main.pdf.pdf.

The proportions of wasted food and drink (edible parts) by food group (weight) are:

- Fresh vegetables & salad – 28%
- Drinks – 15%
- Bakery – 11%
- Meals – 9%
- Dairy & eggs – 9%
- Fresh fruit – 6%
- Meat & fish – 6%

When compared against the proportions of wasted food and drink (edible parts) by cost, Figure 13, there are some significant differences. The higher cost of cakes and desserts per weight of item can be observed in the greater proportion of 'other waste' in the right section of the figure. Similarly, the greater proportion of meat and fish waste in the right section of the figure reflects a higher relative cost per weight when compared to a category like drink.

Figure 13: Proportions of wasted food and drink (edible parts) by food group: weight (left) and cost (right)



5.1 2012 Vegetables and Salad

The vegetables and salad category was split into 'fresh' and 'processed' to differentiate between those purchased in a fresh / uncut state, and those purchased preserved or pre-prepared. These foods are often prepared in the home to form part of a meal (for instance as a vegetable portion in a meal, or a vegetable curry). When disposed of as a separate item – including the peelings and other discarded parts from the preparation of the meal – the waste was classified as fresh vegetables and salad, whereas where it was combined with other ingredients, it was classified as a meal (Section 5.7).

5.1.1 Breakdown of fresh vegetables and salad by edibility

Each food type is considered in terms of whether it is wasted food (i.e. edible parts) or the associated inedible parts (as described in Section 2.1). Examples of wasted food from fresh vegetables and salad are lettuce leaves and parsnip flesh but also parts of food that had been classified as 'potentially avoidable' in the original report such as

potato peel and the outer leaves of a cabbage. Discarded inedible parts include, for example, the heart of a cabbage and onion skin.

Figure 14: Weight of fresh vegetable and salad waste in 2012 by type

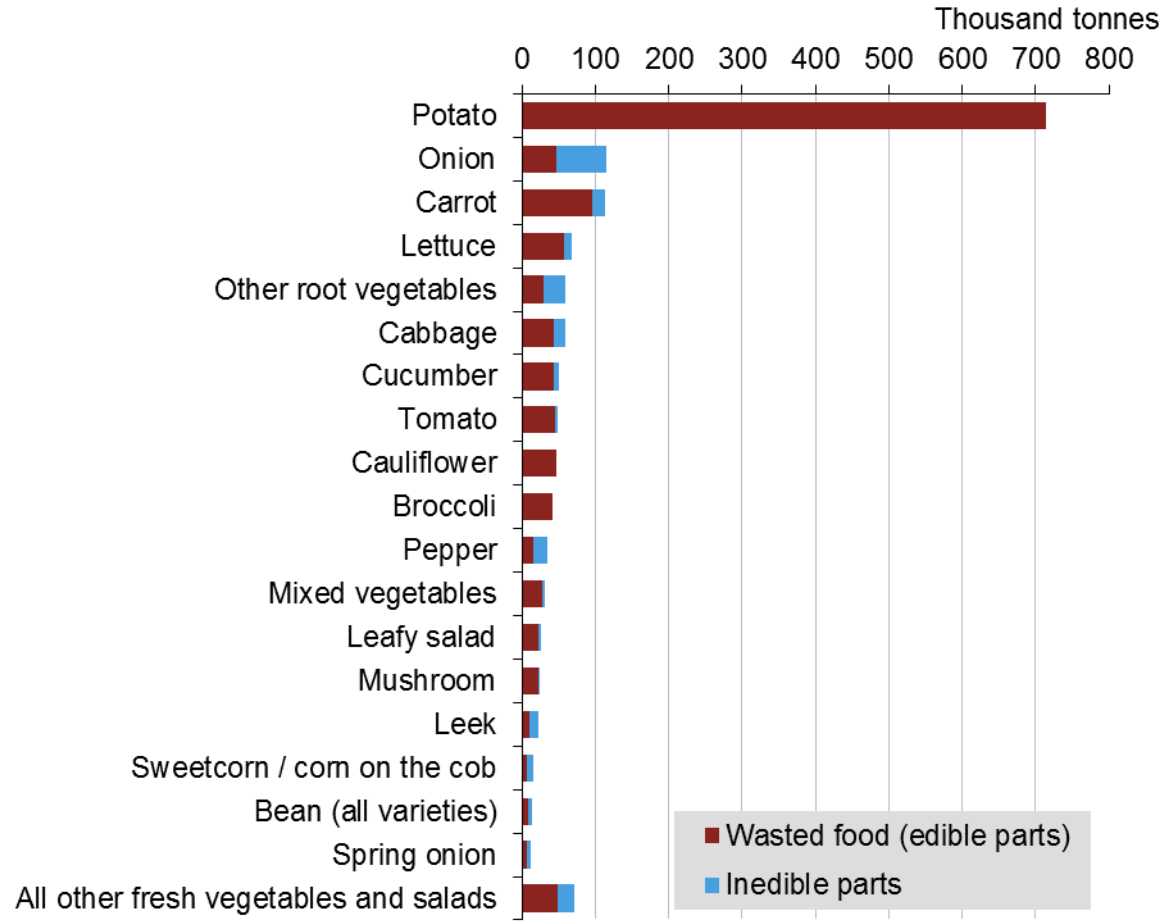


Figure 14 and Table 12 show the weight of fresh vegetable and salad waste by food type and edibility. The total amount of fresh vegetable and salad waste in 2012 was in the region of 1.6 million tonnes, of which approximately 80% (1.3 million tonnes) was food. The cost of the wasted food was in the region of £2.7 billion.

Table 12: Fresh vegetables and salad waste in 2012 by type, split by wasted food / inedible parts and the cost of wasted food

Food Type	Weight generated (tonnes)			Wasted food (£ million)
	Wasted food (edible parts)	Inedible parts	Total food waste	
Potato (fresh)	710,000	<1,000	710,000	£555
Onion (fresh)	47,000	68,000	120,000	£69
Carrot (fresh)	96,000	17,000	110,000	£102
Lettuce (fresh)	57,000	11,000	68,000	£402
Other root vegetables (fresh)	29,000	30,000	59,000	£57
Cabbage (fresh)	43,000	15,000	58,000	£65
Cucumber (fresh)	43,000	7,000	50,000	£77
Tomato (fresh)	46,000	3,000	48,000	£128
Cauliflower (fresh)	46,000	<1,000	46,000	£88
Broccoli (fresh)	41,000	<1,000	41,000	£219
Pepper (fresh)	16,000	19,000	35,000	£163
Mixed vegetables (fresh)	28,000	3,000	31,000	£94
Leafy salad (fresh)	22,000	3,000	25,000	£64
Mushroom (fresh)	22,000	<1,000	22,000	£73
Leek (fresh)	10,000	11,000	21,000	£67
Sweetcorn / corn on the cob (fresh)	7,000	9,000	16,000	£103
Bean (all varieties) (fresh)	8,000	4,000	13,000	£31
Spring onion (fresh)	6,000	5,000	11,000	£28
All other fresh vegetables and salads	49,000	22,000	71,000	£315
Total fresh vegetables and salads	**1,300,000**	**230,000**	**1,600,000**	**£2,700**

Columns or rows may not total due to rounding convention

5.1.2 Breakdown of fresh vegetables and salad waste by the reason for discarding (excluding inedible parts)

Figure 15 and Table 13 show the weight of wasted food from the fresh vegetable and salad category by the reason given for discarding it (as reported in the kitchen-diary). Food comprising fresh vegetable and salad wasted on account of personal preference weighed 610,000 tonnes, almost half the total wasted food in this category.

Table 14 shows the cost of wasted food by reason for discarding. Fresh vegetables and salad wasted because they were not used in time cost £1.3 billion, approximately half of the total cost of wasted food from the fresh vegetable and salad category. However, personal preference is also important; it accounts for a little over a third of the cost of wasted food from this category.

Figure 15: Weight of edible parts of fresh vegetable and salad waste by type, split by reason for discarding

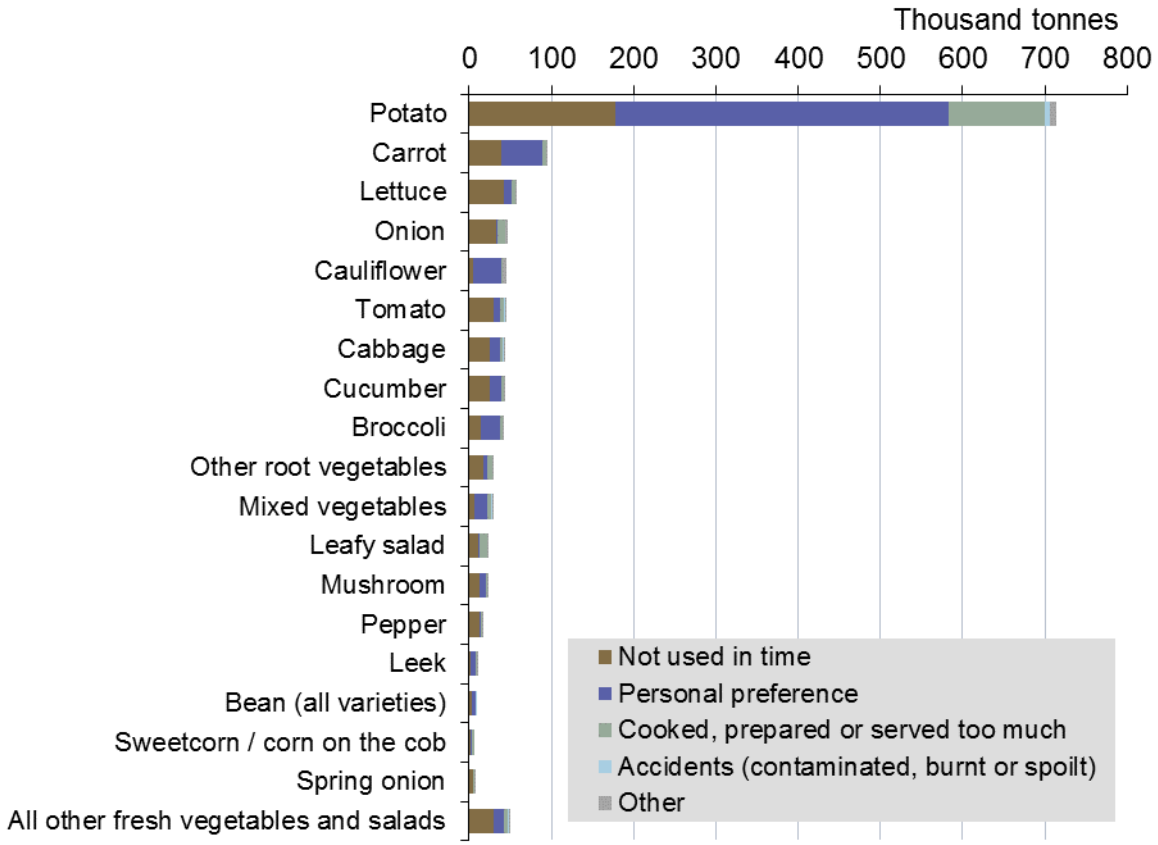


Table 13: Weight of edible parts of fresh vegetable and salad waste (tonnes) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Potato (fresh)	180,000	400,000	120,000	5,000	8,000
Carrot (fresh)	39,000	50,000	4,000	<1,000	2,000
Lettuce (fresh)	43,000	9,000	5,000	<1,000	<1,000
Onion (fresh)	32,000	2,000	9,000	<1,000	3,000
Cauliflower (fresh)	5,000	34,000	1,000	<1,000	5,000
Tomato (fresh)	29,000	9,000	5,000	2,000	1,000
Cabbage (fresh)	25,000	12,000	3,000	1,000	1,000
Cucumber (fresh)	26,000	14,000	2,000	<1,000	<1,000
Broccoli (fresh)	14,000	24,000	3,000	<1,000	<1,000
Other root vegetables (fresh)	17,000	5,000	6,000	<1,000	<1,000
Mixed vegetables (fresh)	7,000	16,000	4,000	1,000	<1,000
Leafy salad (fresh)	11,000	1,000	10,000	<1,000	<1,000
Mushroom (fresh)	13,000	8,000	<1,000	<1,000	<1,000
Pepper (fresh)	13,000	<1,000	2,000	<1,000	<1,000
Leek (fresh)	2,000	6,000	2,000	<1,000	<1,000
Bean (all varieties) (fresh)	Results omitted as too few diary entries to quantify accurately				
Sweetcorn / corn on the cob (fresh)	Results omitted as too few diary entries to quantify accurately				
Spring onion (fresh)	Results omitted as too few diary entries to quantify accurately				
All other fresh vegetables and salads	30,000	13,000	5,000	<1,000	<1,000
Total fresh vegetables and salads	**490,000**	**610,000**	**180,000**	**14,000**	**25,000**

Columns or rows may not total due to rounding convention.

Table 14: Cost of edible parts of fresh vegetable and salad waste (£ million) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Potato	£140	£310	£91	£4	£7
Carrot	£42	£53	£5	<£1	£2
Lettuce	£300	£61	£35	£1	£5
Onion	£48	£2	£14	£1	£4
Cauliflower	£10	£66	£2	<£1	£9
Tomato	£82	£24	£14	£4	£3
Cabbage	£38	£19	£4	£2	£2
Cucumber	£46	£26	£4	<£1	<£1
Broccoli	£73	£130	£15	<£1	<£1
Other root vegetables	£33	£10	£11	<£1	£2
Mixed vegetables	£23	£52	£13	£5	<£1
Leafy salad	£32	£3	£28	<£1	<£1
Mushroom	£42	£25	£3	£1	<£1
Pepper	£130	£4	£24	<£1	£1
Leek	£12	£39	£11	£2	£3
Bean (all varieties)	Results omitted as too few diary entries to quantify accurately				
Sweetcorn / corn on the cob	Results omitted as too few diary entries to quantify accurately				
Spring onion	Results omitted as too few diary entries to quantify accurately				
All other fresh vegetables and salads	£210	£68	£21	£7	£8
Total fresh vegetables and salads	**£1,300**	**£930**	**£360**	**£32**	**£49**

Columns or rows may not total due to rounding convention.

5.1.3 Breakdown of processed vegetables and salad by edibility

Figure 16 and Table 15 show the weight of processed vegetable and salad waste by food type and edibility. The total amount of processed vegetable and salad waste in 2012 was

in the region of 170,000 tonnes: almost all of this was food. The cost of the wasted food was in the region of £500 million.

Figure 16: Weight of processed vegetable and salad waste in 2012 by type

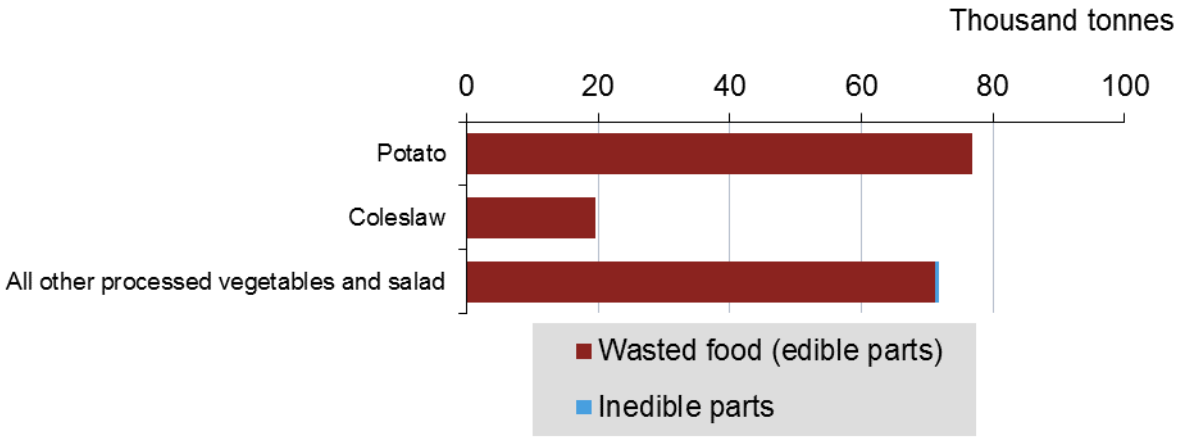


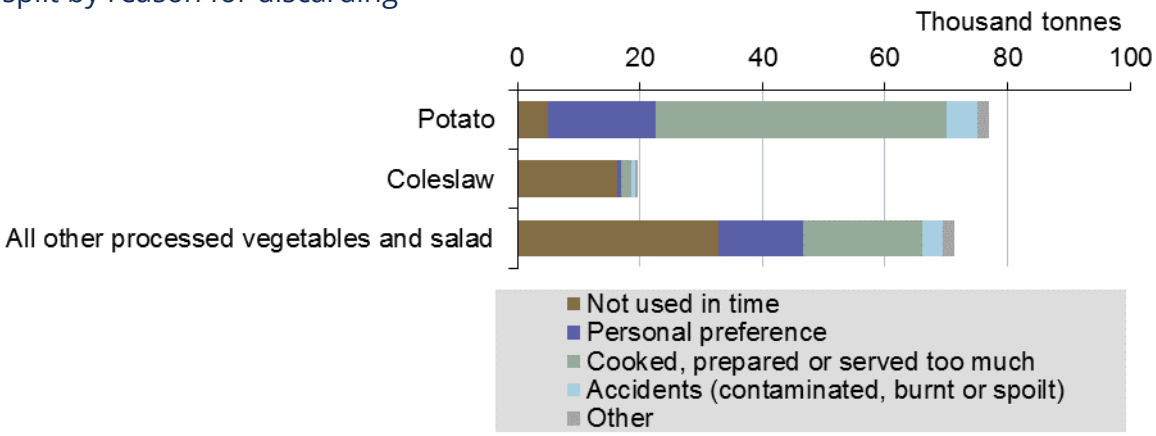
Table 15: Processed vegetables and salad waste in 2012 by type, split by wasted food / inedible parts and the cost of wasted food

Food Type	Weight generated (tonnes)			Wasted food (£ million)
	Wasted food (edible parts)	Inedible parts	Total food waste	
Potato	77,000	<1,000	77,000	£260
Coleslaw	20,000	<1,000	20,000	£39
All other processed vegetables and salad	71,000	<1,000	72,000	£200
Total processed vegetables and salads	**170,000**	**<1,000**	**170,000**	**£500**

Columns or rows may not total due to rounding convention.

5.1.4 Breakdown of processed vegetable and salad waste by reason for discarding (excluding inedible parts)

Figure 17: Weight of edible parts of processed vegetable and salad wasted food by type, split by reason for discarding



Columns or rows may not total due to rounding convention.

Table 16 and Table 17 show the weight and cost of processed vegetable and salad waste in 2012 by reason for discarding. For potatoes, cooking, preparing or serving too much was the main reason for discarding while other processed vegetables and salad were more often wasted because they were not used in time.

Table 16: Weight of edible parts of processed vegetable and salad waste (tonnes) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Potato	5,000	18,000	48,000	5,000	2,000
Coleslaw	16,000	<1,000	2,000	<1,000	<1,000
All other processed vegetables and salad	33,000	14,000	19,000	3,000	2,000
Total processed vegetables and salads	**54,000**	**32,000**	**69,000**	**9,000**	**4,000**

Columns or rows may not total due to rounding convention.

Table 17: Cost of edible parts of processed vegetable and salad waste (£ million) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Potato	£17	£60	£160	£17	£6
Coleslaw	£32	£1	£3	£1	£1

All other fresh vegetables and salads	£85	£48	£52	£6	£5
Total processed vegetables and salads	**£130**	**£110**	**£220**	**£24**	**£12**

Columns or rows may not total due to rounding convention.

5.2 2012 Drink

This category includes soft drinks, bottled water, milkshakes, juices, hot beverages and alcoholic drinks. Tap water added to items poured down the sink has been omitted from the results. Therefore, water used to make tea and coffee or to dilute squash has been subtracted from the data, as discussed in Chapter 8 of the *Methods Annex Report*[42]. Soups and milk are not included here because they are generally considered to be foodstuffs rather than drink, and are classified under meals (Section 5.7) and dairy and eggs (Section 5.6) respectively.

5.2.1 Breakdown of drink by edibility[43]

Drinks accounted for 1.2 million tonnes of waste. A little over 40% of this comprises inedible parts, mainly discarded used and unused tea bags and coffee grounds. The wasted food cost UK households £1.2 billion.

Tea that is 'wasted food' is made up of unused tea bags and materials associated with 'liquid' tea that has not been drunk; (for example milk and sugar); the water used to make the tea has been excluded.

[42] WRAP. (2013b). *Methods used for Household Food and Drink Waste in the UK 2012. Annex Report v2*. [online] available at: http://www.wrap.org.uk/sites/files/wrap/Methods%20Annex%20Report%20v2.pdf.

[43] *Liquids are not edible in a literal sense. The word is used here for consistency with the rest of the report as opposed to 'potability' or 'imbibability'.*

Figure 18: Weight of drink waste in 2012 by type

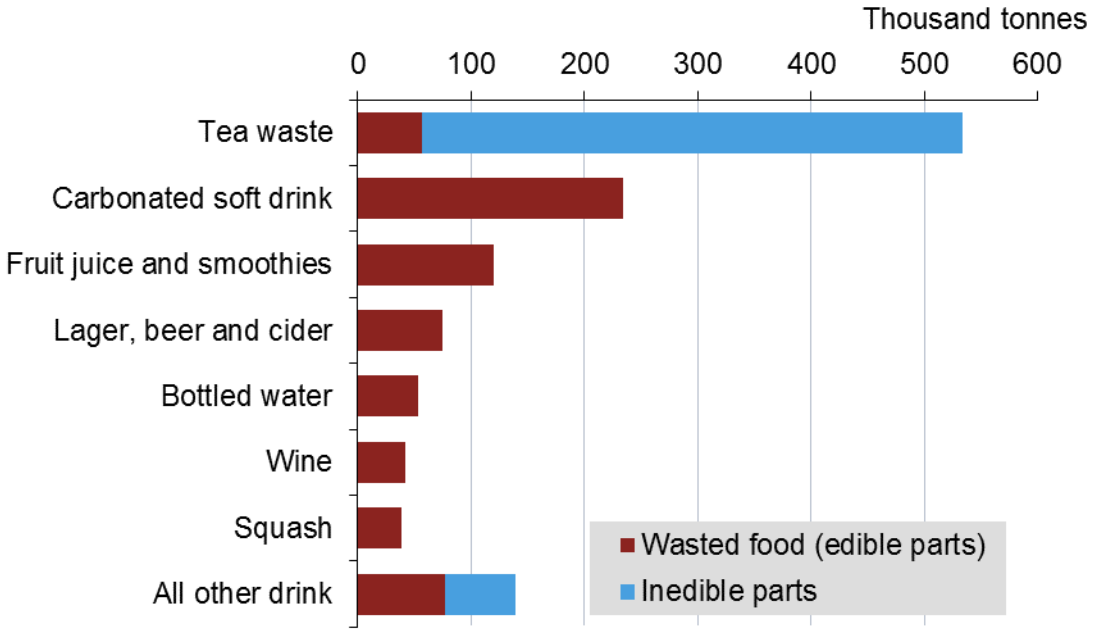


Table 18: Drink waste in 2012 by type, split by wasted food / inedible parts and the cost of wasted food

Food Type	Weight generated (tonnes)			Wasted food (£ million)
	Wasted food (edible parts)	Inedible parts	Total food waste	
Tea waste	56,000	480,000	530,000	£55
Carbonated soft drink	230,000	<1,000	230,000	£190
Fruit juice and smoothies	120,000	<1,000	120,000	£150
Lager, beer and cider	75,000	<1,000	75,000	£160
Bottled water	54,000	<1,000	54,000	£20
Wine	42,000	<1,000	42,000	£290
Squash	39,000	<1,000	39,000	£44
All other drink	77,000	63,000	140,000	£340
Total drink	**700,000**	**540,000**	**1,200,000**	**£1,200**

Columns or rows may not total due to rounding convention.

5.2.2 Breakdown of drink waste by reasons for discarding (excluding inedible parts)

Over half of the drinks were discarded of because too much was cooked, prepared or served[44] at a cost of £600 million. For carbonated soft drinks, this discard route accounted for almost three-quarters of the waste. However, for drinks with short shelf-lives (e.g. smoothies) or those that are consumed shortly after opening (lager, beer, cider and wine), a greater proportion was discarded because it was not used in time at a cost of £410 million. The relatively high cost of wine discarded for this reason increases the overall cost of this waste relative to the weight.

[44] *For drinks 'prepared or served too much' is obviously more relevant than 'cooked too much'.*

Figure 19: Weight of edible parts of drink waste by type, split by reason for discarding

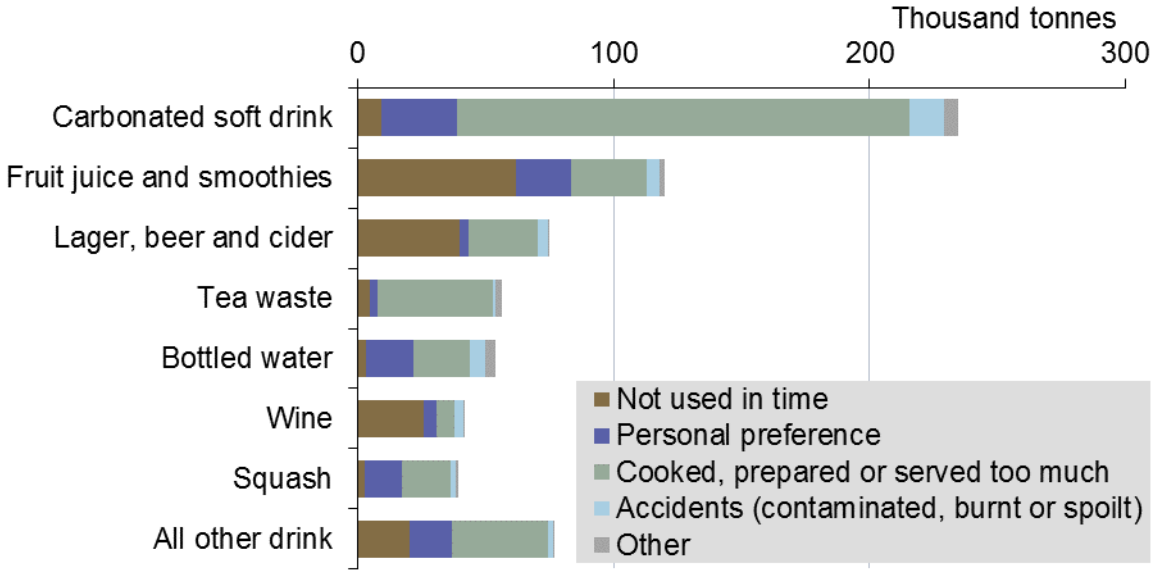


Table 19: Weight of edible parts of drink waste (tonnes) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Carbonated soft drink	9,000	29,000	180,000	14,000	5,000
Fruit juice and smoothies	62,000	21,000	30,000	5,000	2,000
Lager, beer and cider	39,000	4,000	27,000	4,000	<1,000
Tea waste	5,000	3,000	45,000	<1,000	3,000
Bottled water	3,000	19,000	22,000	6,000	4,000
Wine	26,000	5,000	7,000	3,000	<1,000
Squash	3,000	15,000	19,000	2,000	<1,000
All other drink	20,000	16,000	38,000	2,000	<1,000
Total drink	**170,000**	**110,000**	**360,000**	**37,000**	**16,000**

Columns or rows may not total due to rounding convention.

Table 20: Cost of edible parts of drink waste (£ million) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Carbonated soft drink	£8	£24	£150	£11	£4
Fruit juice and smoothies	£76	£26	£36	£6	£3
Lager, beer and cider	£84	£8	£57	£9	£1
Tea waste	£5	£3	£45	<£1	£3
Bottled water	£1	£7	£8	£2	£1
Wine	£180	£35	£49	£23	£5
Squash	£3	£16	£21	£3	<£1
All other drink	£55	£41	£240	£3	£3
Total drink	**£410**	**£160**	**£600**	**£57**	**£20**

Columns or rows may not total due to rounding convention.

5.3 2012 Fruit

In this report, fruit is categorised according to the culinary definition, rather than the botanical definition. Hence, many food stuffs that are botanically fruit but are eaten as salad or vegetables – such as tomatoes or squash – are classified under vegetables and salad (Section 5.1).

5.3.1 Breakdown of fruit by edibility

Approximately 940,000 tonnes of fruit waste were produced by households in the UK in 2012. Of this, only 20,000 were processed; the vast majority of fruit waste is fresh fruit. Around a third of the waste was food (edible parts), meaning that the majority comprises inedible parts such as banana peel (270,000 tonnes) and hard peel of other fruit. Apple and berry waste has the highest ratio of wasted food to discarded inedible parts.

Figure 20: Weight of fresh fruit waste in 2012 by type

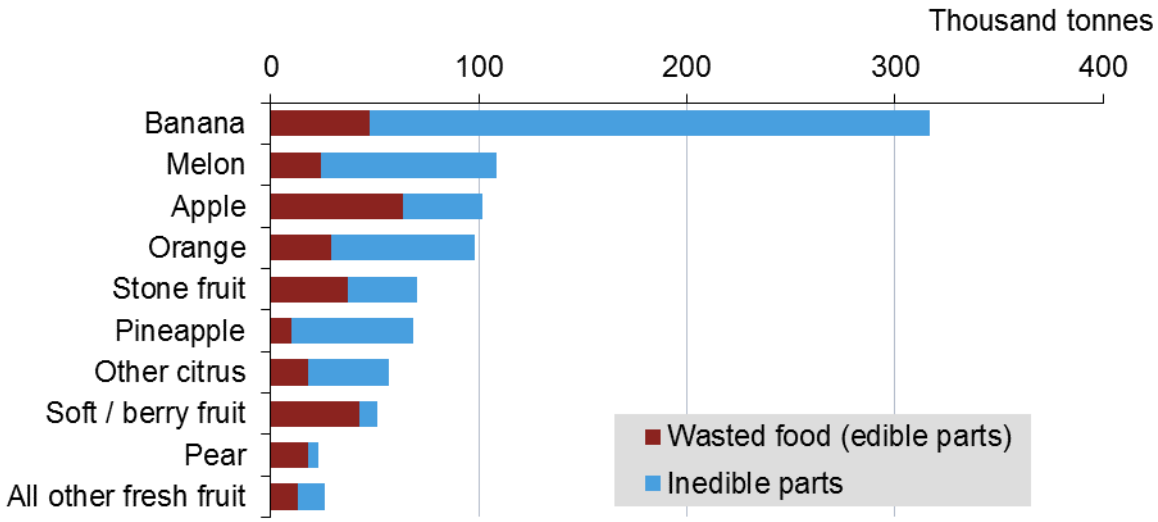


Table 21: The amount of fruit waste in 2012 by type, split by wasted food / inedible parts and the cost of wasted food

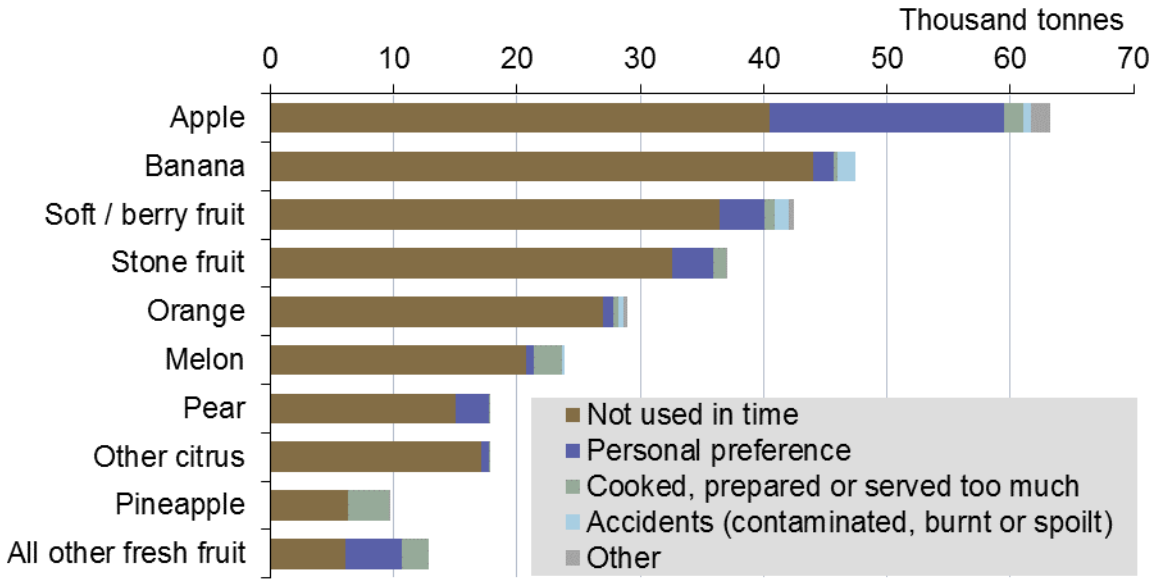
Food Type	Weight generated (tonnes)			Wasted food (£ million)
	Wasted food (edible parts)	Inedible parts	Total food waste	
Banana	47,000	270,000	320,000	£67
Melon	24,000	85,000	110,000	£59
Apple	63,000	38,000	100,000	£130
Orange	29,000	69,000	98,000	£56
Stone fruit	37,000	33,000	70,000	£140
Pineapple	10,000	59,000	68,000	£120
Other citrus	18,000	39,000	57,000	£52
Soft / berry fruit	42,000	9,000	51,000	£210
Pear	18,000	5,000	23,000	£33
All other fresh fruit	13,000	13,000	26,000	£200
Total fresh fruit	**300,000**	**620,000**	**920,000**	**£1,100**
Total processed fruit	**20,000**	**<1,000**	**20,000**	**£190**
Total fruit	**320,000**	**620,000**	**940,000**	**£1,200**

Columns or rows may not total due to rounding convention.

5.3.2 Breakdown of fruit waste by reasons for discarding (excluding inedible parts)

The vast majority of fresh and processed fruit was disposed of because it was not being used in time (e.g. it had gone rotten, mouldy or otherwise inedible). This is likely to be linked to the perishability of fruit and the large quantities that are often purchased. This could be further exacerbated by fruit being stored in sub-optimal conditions – in general, fruit will store for longer in the fridge[45].

Figure 21: Weight of edible parts of fruit waste by type, split by reason for discarding



Results for melon and pineapple omitted as too few instances of edible waste in the diary research to be able to quantify reasons for discarding accurately.

[45] *http://www.wrap.org.uk/content/helping-consumers-reduce-fruit-and-vegetable-waste*

Table 22: Weight of edible parts of fruit waste (tonnes) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Apple	40,000	19,000	2,000	<1,000	1,000
Banana	44,000	2,000	<1,000	1,000	<1,000
Soft / berry fruit	36,000	4,000	<1,000	1,000	<1,000
Stone fruit	33,000	3,000	<1,000	<1,000	<1,000
Orange	27,000	<1,000	<1,000	<1,000	<1,000
Melon	Results omitted as too little information to quantify				
Pear	15,000	3,000	<1,000	<1,000	<1,000
Other citrus	17,000	<1,000	<1,000	<1,000	<1,000
Pineapple	Results omitted as too little information to quantify				
All other fresh fruit	6,000	5,000	2,000	<1,000	<1,000
Total fresh fruit	**250,000**	**37,000**	**12,000**	**4,000**	**2,000**
Total processed fruit	**10,000**	**5,000**	**5,000**	**<1,000**	**<1,000**
Total fruit	**260,000**	**41,000**	**18,000**	**4,100**	**2,000**

Columns or rows may not total due to rounding convention.

Table 23: Cost of edible parts of fruit waste (£ million) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Apple	£81	£38	£3	£1	£3
Banana	£62	£2	<£1	£2	<£1
Soft / berry fruit	£180	£17	£4	£5	£2
Stone fruit	£120	£13	£4	<£1	<£1
Orange	£52	£2	<£1	<£1	<£1
Melon	Results omitted as too little information to quantify				
Pear	£28	£5	<£1	<£1	<£1
Other citrus	£50	£2	<£1	<£1	<£1
Pineapple	Results omitted as too little information to quantify				
All other fresh fruit	£100	£43	£53	<£1	<£1
Total fresh fruit	**£800**	**£120**	**£110**	**£10**	**£7**
Total processed fruit	**£85**	**£88**	**£12**	**£1**	**<£1**
Total fruit	**£890**	**£210**	**£130**	**£11**	**£7**

Columns or rows may not total due to rounding convention.

5.4 2012 Meat and Fish

This group includes carcass meats and processed meats, and all fish and shellfish, except those disposed of as part of a meal.

5.4.1 Breakdown of meat and fish by edibility

Meat and fish waste amounted to 510,000 tonnes in the UK in 2012, of which over half (300,000 tonnes) was food costing £2.6 billion.

Just over half the meat and fish waste was poultry (250,000 tonnes). Although when considering wasted food alone, pork/ham/bacon waste was roughly equivalent to poultry waste at around 100,000 tonnes each.

Figure 22: Weight of meat and fish waste in 2012 by type

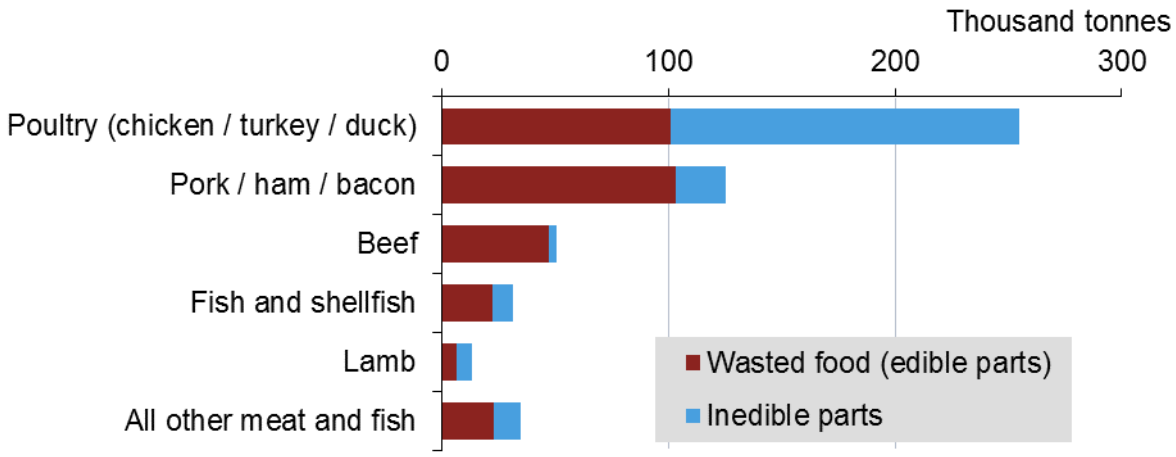


Table 24: Meat and fish waste in 2012 by type, split by wasted food / inedible parts and the cost of wasted food

Food Type	Weight generated (tonnes)			Wasted food (£ million)
	Wasted food (edible parts)	Inedible parts	Total food waste	
Poultry (chicken / turkey / duck)	100,000	150,000	250,000	£910
Pork / ham / bacon	100,000	22,000	130,000	£840
Beef	47,000	4,000	51,000	£400
Fish and shellfish	23,000	9,000	31,000	£260
Lamb	7,000	7,000	14,000	£80
All other meat and fish	23,000	12,000	35,000	£150
Total meat and fish	**300,000**	**210,000**	**510,000**	**£2,600**

Columns or rows may not total due to rounding convention.

5.4.2 Breakdown of meat and fish waste by reasons for discarding (excluding inedible parts)

Of meat and fish waste, around 90% of the wasted food was discarded for three reasons: not used in time, personal preference and cooked, prepared or served too much. The amounts discarded for these three reasons are of a similar quantity. There is a large proportionate increase in meat and fish waste discarded due to personal preference relative to the quantities of avoidable waste reported in the original report. This is as a result of the classification of skin and fat as food in this report.

Figure 23: Weight of edible parts of meat and fish waste by type, split by reason for discarding

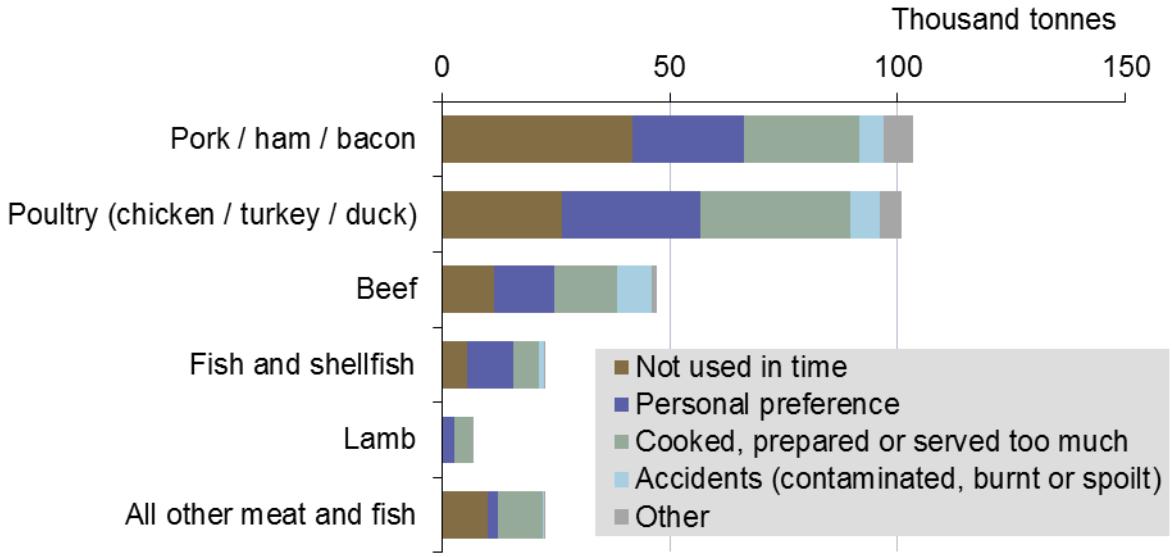


Table 25: Weight of edible parts of meat and fish waste (tonnes) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Pork / ham / bacon	42,000	24,000	25,000	5,000	6,000
Poultry (chicken / turkey / duck)	26,000	30,000	33,000	7,000	5,000
Beef	12,000	13,000	14,000	8,000	<1,000
Fish and shellfish	5,000	10,000	6,000	1,000	<1,000
Lamb	<1,000	3,000	4,000	<1,000	<1,000
All other meat and fish	10,000	2,000	10,000	<1,000	<1,000
Total meat and fish	**95,000**	**83,000**	**91,000**	**21,000**	**13,000**

Columns or rows may not total due to rounding convention.

Table 26: Cost of edible parts of meat and fish waste (£ million) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Pork / ham / bacon	£340	£200	£210	£43	£52
Poultry (chicken / turkey / duck)	£240	£270	£300	£60	£41
Beef	£98	£110	£120	£64	£8
Fish and shellfish	£63	£120	£64	£15	£2
Lamb	£2	£31	£45	<£1	£3
All other meat and fish	£70	£14	£66	£1	£4
Total meat and fish	**£810**	**£750**	**£790**	**£180**	**£110**

Columns or rows may not total due to rounding convention.

5.4.3 Further breakdown of poultry and pork by food subtype

Due to the high number of instances of poultry and pork waste in the research, it is possible to investigate these food types in greater detail whilst still maintaining an acceptable degree of confidence around the estimates.

Table 27: Poultry waste in 2012 by type, split by wasted food / inedible parts and the cost of wasted food

Food Type	Weight generated (tonnes)			Wasted food (£ million)
	Wasted food (edible parts)	Inedible parts	Total food waste	
Poultry - carcass meat / bones	86,000	150,000	240,000	£790
Poultry - poultry product	10,000	2,000	11,000	£88
Sliced poultry	5,000	<1,000	5,000	£32
All poultry	**100,000**	**150,000**	**250,000**	**£910**

Columns or rows may not total due to rounding convention.

The vast majority of poultry waste comes from carcass meat and bones, of which 86,000 tonnes were food at a cost of £790 million.

Table 28: Pork waste in 2012 by type, split by wasted food / inedible parts and the cost of wasted food

Food Type	Weight generated (tonnes)			Wasted food (£ million)
	Wasted food (edible parts)	Inedible parts	Total food waste	
Pork - Carcass meat / bones	27,000	21,000	48,000	£320
Pork - Sausages	28,000	<1,000	28,000	£130
Pork - bacon	21,000	<1,000	21,000	£140
Pork - Sliced ham	20,000	<1,000	20,000	£200
Pork - other	7,000	1,000	8,000	£40
Total pork	**100,000**	**22,000**	**130,000**	**£840**

Columns or rows may not total due to rounding convention.

UK households produced 130,000 tonnes of pork waste in 2012, of which a little over 80% was food at a cost of £840. Pork waste (excluding inedible parts) is split relatively evenly across the subtypes.

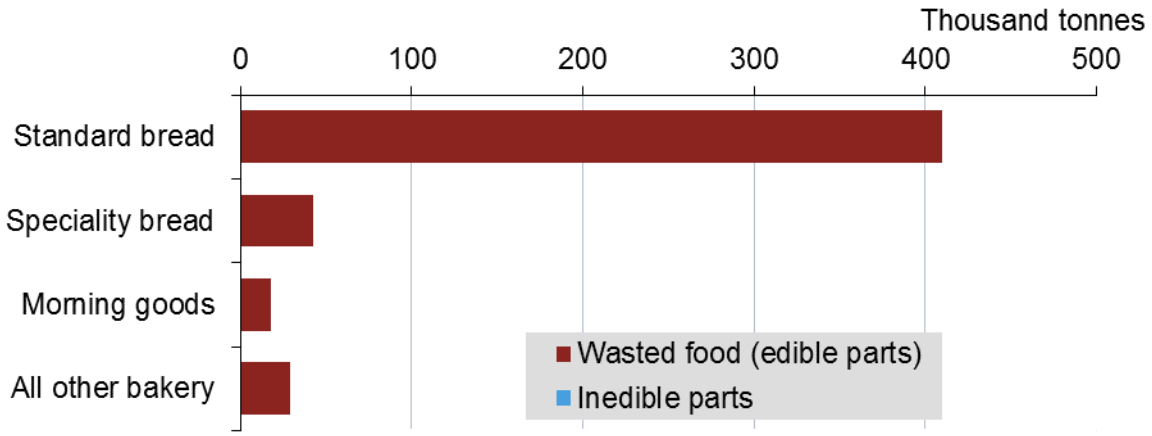
5.5 2012 Bakery

The only bakery not considered in this section is sweet bakery, which can be found in cakes and desserts (Section 5.8.1), and bread found in sandwiches, included in meals (Section 5.7).

5.5.1 Breakdown of bakery by edibility

All bakery waste produced by UK households in 2012 is considered to be food, totalling 500,000 tonnes and costing £870 million. Over 80% of this waste was standard bread[46].

Figure 24: Weight of bakery waste in 2012 by type



[46] *See Appendix D for what this comprises.*

Table 29: Bakery waste in 2012 by type, split by wasted food / inedible parts and the cost of wasted food

Food Type	Weight generated (tonnes)			Wasted food (£ million)
	Wasted food (edible parts)	Inedible parts	Total food waste	
Standard bread	410,000	<1,000	410,000	£570
Speciality bread	43,000	<1,000	43,000	£110
Morning goods	18,000	<1,000	18,000	£47
All other bakery	29,000	<1,000	29,000	£130
Total bakery	**500,000**	**<1,000**	**500,000**	**£870**

Columns or rows may not total due to rounding convention.

5.5.2 Breakdown of bakery waste by reasons for discarding (excluding inedible parts)

Over half of bakery waste produced by UK households in 2012 was due to it not being used in time. A quarter of the waste was due to personal preference, mainly comprising of bread crusts.

Figure 25: Weight of edible parts of bakery waste by type, split by reason for discarding

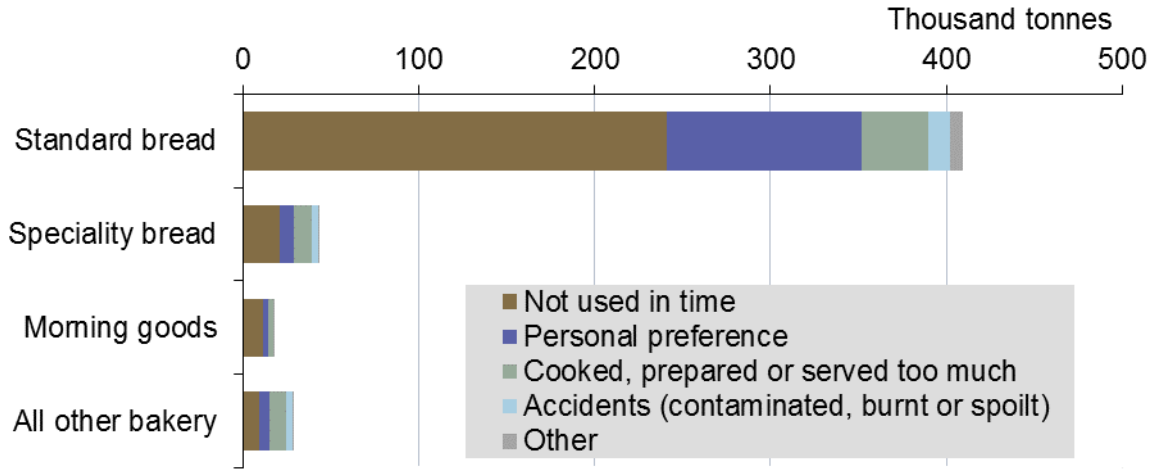


Table 30: Weight of edible parts of bakery waste (tonnes) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Standard bread	240,000	110,000	38,000	13,000	7,000
Speciality bread	21,000	8,000	11,000	3,000	<1,000
Morning goods	12,000	3,000	3,000	<1,000	<1,000
All other bakery	10,000	5,000	10,000	3,000	<1,000
Total bakery	**280,000**	**130,000**	**61,000**	**19,000**	**8,000**

Columns or rows may not total due to rounding convention.

Table 31: Cost of edible parts of bakery waste (£ million) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Standard bread	£340	£150	£53	£18	£10
Speciality bread	£55	£22	£28	£8	<£1
Morning goods	£31	£8	£7	£1	<£1
All other bakery	£46	£24	£45	£16	£2
Total bakery	**£470**	**£210**	**£130**	**£43**	**£13**

Columns or rows may not total due to rounding convention.

5.6 2012 Dairy and Eggs

This category includes the majority of non-meat animal products. Milkshakes and milk substitutes such as soya and rice milk are not included here; they can be found in the drinks group. Foods in this group are frequently used in the preparation of meals, and it is only when the foods themselves could be identified as separate items that they are reported here.

5.6.1 Breakdown of dairy and eggs by edibility

Of the 470,000 tonnes of dairy and egg waste produced by UK households in 2012, only egg shells were considered to be inedible parts, accounting for 59,000 tonnes. The remaining wasted food cost £750 million. Of the wasted food, milk accounted for over two thirds by weight and close to one third by cost.

Figure 26: Weight of dairy and egg waste in 2012 by type

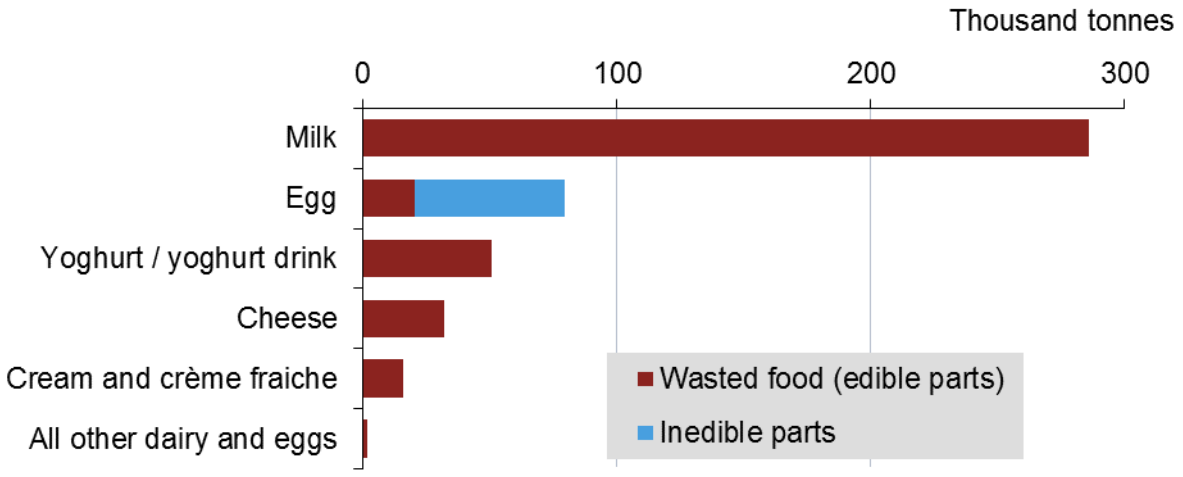


Table 32: Dairy and egg waste in 2012 by type, split by wasted food / inedible parts and the cost of wasted food

Food Type	Weight generated (tonnes)			Wasted food (£ million)
	Wasted food (edible parts)	Inedible parts	Total food waste	
Milk	290,000	<1,000	290,000	£270
Egg	21,000	59,000	79,000	£66
Yoghurt / yoghurt drink	51,000	<1,000	51,000	£130
Cheese	32,000	<1,000	32,000	£230
Cream and crème fraiche	16,000	<1,000	16,000	£55
All other dairy and eggs	2,000	<1,000	2,000	£4
Total dairy and eggs	**410,000**	**59,000**	**470,000**	**£750**

Columns or rows may not total due to rounding convention.

5.6.2 Breakdown of dairy and egg waste by reasons for discarding (excluding inedible parts)

The main reason for discarding wasted dairy and egg was not using it in time, making up around two thirds of the total waste for the category. UK households did however discard a notable amount of milk due to personal preference (45,000 tonnes) and preparing/serving too much (61,000 tonnes).

Figure 27: Weight of edible parts of dairy and egg waste by type, split by reason for discarding

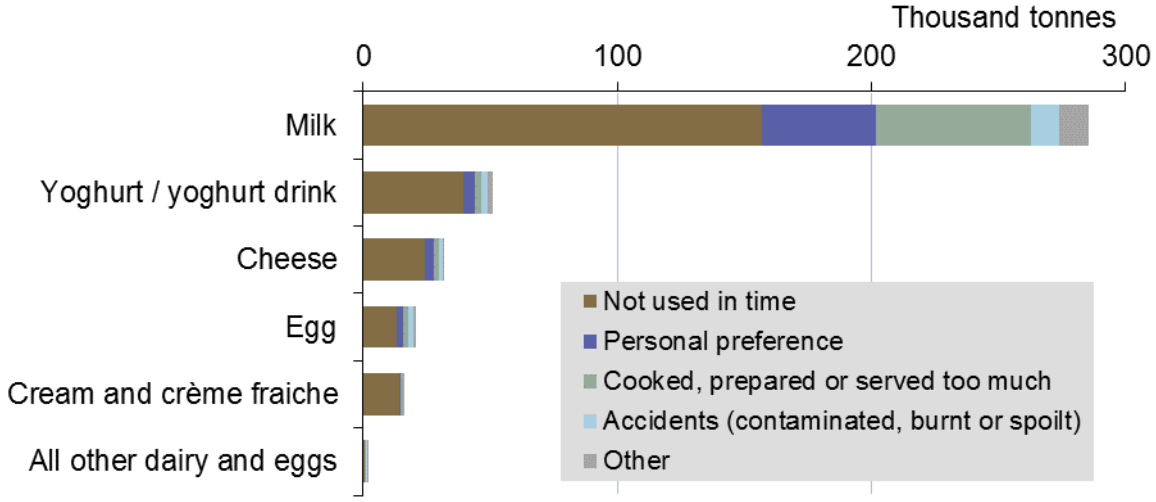


Table 33: Weight of edible parts of dairy and egg waste (tonnes) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Milk	160,000	45,000	61,000	12,000	12,000
Yoghurt / yoghurt drink	40,000	4,000	3,000	2,000	2,000
Cheese	24,000	4,000	2,000	1,000	<1,000
Egg	13,000	2,000	2,000	2,000	<1,000
Cream and crème fraiche	14,000	<1,000	<1,000	<1,000	1,000
All other dairy and eggs	<1,000	<1,000	<1,000	<1,000	<1,000
Total dairy and eggs	**250,000**	**56,000**	**69,000**	**17,000**	**16,000**

Columns or rows may not total due to rounding convention.

Table 34: Cost of edible parts of dairy and egg waste (£ million) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Milk	£150	£43	£58	£11	£11
Yoghurt / yoghurt drink	£100	£11	£7	£5	£5
Cheese	£170	£27	£15	£9	£5
Egg	£43	£7	£7	£6	£3
Cream and crème fraiche	£48	£1	£2	<£1	£4
All other dairy and eggs	£2	<£1	£1	£1	<£1
Total dairy and eggs	**£510**	**£89**	**£90**	**£33**	**£28**

Columns or rows may not total due to rounding convention.

5.7 2012 Home-made and Pre-prepared Meals

We eat a large proportion of our food in the form of meals, and the associated waste reported here only includes that which is discarded into the household waste stream. For foods that are often consumed outside the home such as sandwiches and takeaways there are likely to be additional arisings in non-household waste streams (e.g. litter bins and commercial, office waste).

This food group includes soups, composite meals (e.g. stews and curry), sandwiches, and composite savoury products (e.g. pasties), that can be eaten as a snack on their own or as part of a meal.

5.7.1 Breakdown of meals by edibility

Almost all of the 420,000 tonnes of meal waste produced by households in 2012 was food, costing £1,800 million. Over 60% of this is from composite meals.

Figure 28: Weight of meal waste in 2012 by type

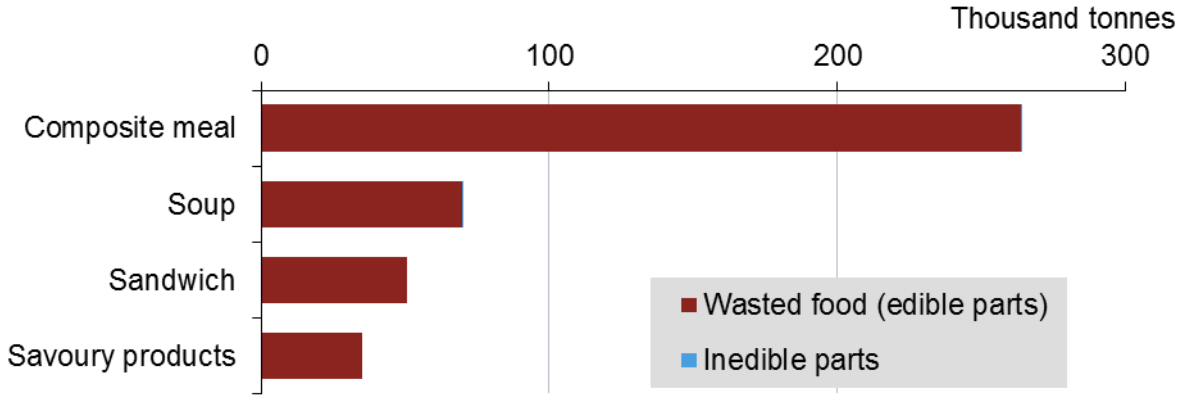


Table 35: Meal waste in 2012 by type, split by wasted food / inedible parts and the cost of wasted food

Food Type	Weight generated (tonnes)			Wasted food (£ million)
	Wasted food (edible parts)	Inedible parts	Total food waste	
Composite meal	260,000	<1,000	260,000	£1,200
Soup	70,000	<1,000	70,000	£130
Sandwich	51,000	<1,000	51,000	£260
Savoury products	35,000	<1,000	35,000	£170
Total meals	**420,000**	**<1,000**	**420,000**	**£1,800**

Columns or rows may not total due to rounding convention.

5.7.2 Breakdown of meal waste by reasons for discarding (excluding inedible parts)

Personal preference and cooking, preparing and serving too much at meal time account for 75% of meal waste produced by UK households in 2012. The different meal types in this category display roughly similar distributions of waste across each reason for discarding.

Figure 29: Weight of edible parts of meal waste by type, split by reason for discarding

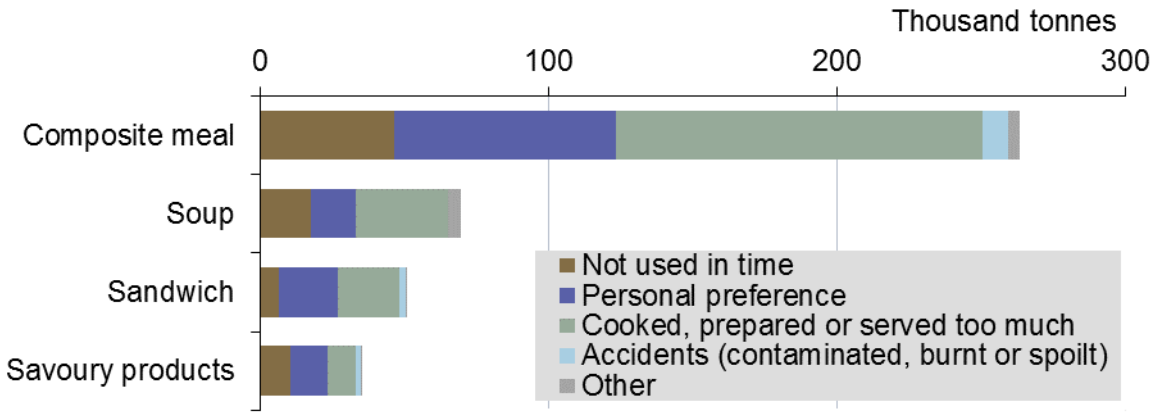


Table 36: Weight of edible parts of meal waste (tonnes) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Composite meal	46,000	77,000	130,000	9,000	4,000
Soup	18,000	15,000	32,000	<1,000	4,000
Sandwich	7,000	20,000	22,000	2,000	<1,000
Savoury products	11,000	13,000	10,000	2,000	<1,000
Total meals	**81,000**	**130,000**	**190,000**	**12,000**	**9,000**

Columns or rows may not total due to rounding convention.

Table 37: Cost of edible parts of meal waste (£ million) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Composite meal	£210	£350	£580	£40	£19
Soup	£33	£28	£59	<£1	£8
Sandwich	£34	£100	£110	£10	£1
Savoury products	£51	£61	£47	£8	£3
Total meals	**£330**	**£550**	**£800**	**£58**	**£31**

Columns or rows may not total due to rounding convention.

5.7.3 Breakdown of meal waste by pre-prepared and home-made

The meals are sub-divided into those purchased pre-prepared and home-made, with the pre-prepared category including ready meals and takeaways. It was not always possible to identify whether food was pre-prepared or home-made; food waste was assumed to be home-made unless it could be identified as pre-prepared.

UK households produced 270,000 tonnes of home-made meal waste at a cost of £940 million and 150,000 tonnes of pre-prepared meal waste at a cost of £830 million in 2012.

Table 38: Meal waste in 2012 by type, split by wasted food / inedible parts and the cost of wasted food

Food Type	Weight generated (tonnes)			Wasted food (£ million)
	Wasted food (edible parts)	Inedible parts	Total food waste	
Home-made	270,000	<1,000	270,000	£940
Pre-prepared	150,000	<1,000	150,000	£830
All meals	**420,000**	**<1,000**	**420,000**	**£1,800**

Columns or rows may not total due to rounding convention.

5.8 2012 Results for food groups with minor contributions

This chapter contains the food groups which each contribute less than 5% to the total amount of household food and drink waste, alongside the 'other' category. The inclusion of food types within these categories is based on the cut-off rule described in the *Methods Annex Report*[47]. In light of this, and the fewer instances of food and drink waste recorded for these food groups, the breakdown of information to the level of food type is limited. Many of the potential tables in this chapter are omitted or, if included, contain less information than preceding sections.

5.8.1 Cakes and Desserts

This group includes all sweet items that could be consumed at the end of a meal, but many of the items are also consumed as snacks. Further categories relating to confectionery and snacks are shown in Section 5.8.5.

UK households produced 140,000 tonnes of cake and dessert waste in 2012, of which all was food and cost £540 million. Over half of this waste was due to it not being used in time.

[47] WRAP. (2013b). *Methods used for Household Food and Drink Waste in the UK 2012. Annex Report v2*. [online] available at: http://www.wrap.org.uk/sites/files/wrap/Methods%20Annex%20Report%20v2.pdf.

Table 39: Cake and dessert waste in 2012 by type, split by wasted food / inedible parts and the cost of wasted food

Food Type	Weight generated (tonnes)			Wasted food (£ million)
	Wasted food (edible parts)	Inedible parts	Total food waste	
Cakes / gateau / doughnuts / pastries	75,000	<1,000	75,000	£350
All other cake and desserts	69,000	<1,000	69,000	£190
Total cake and desserts	**140,000**	**<1,000**	**140,000**	**£540**

Columns or rows may not total due to rounding convention.

Table 40: Weight of edible parts of cake and dessert waste (tonnes) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Cakes / gateau / doughnuts / pastries	43,000	19,000	8,000	4,000	1,000
All other cake and desserts	34,000	11,000	19,000	5,000	<1,000
Total cake and dessert	**77,000**	**30,000**	**26,000**	**8,000**	**2,000**

Columns or rows may not total due to rounding convention.

5.8.2 Staple Foods

Staple foods are starchy foods made from wheat, rice, other grains and vegetables that we eat as a source of carbohydrate. This food group does not contain bread or potatoes as these are classified as bakery and vegetables respectively.

UK households produced 140,000 tonnes of staple food waste in 2012, of which all was food and cost £320 million. Over half of this waste was due to cooking, preparing or serving too much.

Table 41: Staple food waste in 2012 by type, split by wasted food / inedible parts and the cost of wasted food

Food Type	Weight generated (tonnes)			Wasted food (£ million)
	Wasted food (edible parts)	Inedible parts	Total food waste	
Breakfast cereal	60,000	<1,000	60,000	£200
Rice	41,000	<1,000	41,000	£73
Pasta	31,000	<1,000	31,000	£45
All other staple foods	10,000	<1,000	10,000	£10
Total staple foods	**140,000**	**<1,000**	**140,000**	**£320**

Columns or rows may not total due to rounding convention.

Table 42: Weight of edible parts of staple food waste (tonnes) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Breakfast cereal	12,000	20,000	23,000	3,000	1,000
Rice	5,000	<1,000	31,000	4,000	<1,000
Pasta	4,000	3,000	22,000	<1,000	<1,000
All other staple foods	7,000	<1,000	1,000	1,000	<1,000
Total staple foods	**27,000**	**25,000**	**78,000**	**10,000**	**2,000**

Columns or rows may not total due to rounding convention.

5.8.3 Condiments, Sauces, Herbs & Spices

Items in this group are usually added to other foods in small amounts in order to impart flavours.

UK households produced 140,000 tonnes of condiment, sauce, herb and spice waste in 2012. Almost all of this was food, costing £630 million. Close to a third of the waste was cook in sauce and approaching two thirds of the total wasted food was produced due to not being used in time.

Table 43: Condiment, sauce, herb and spice waste in 2012 by type, split by wasted food / inedible parts and the cost of wasted food

Food Type	Weight generated (tonnes)			Wasted food (£ million)
	Wasted food (edible parts)	Inedible parts	Total food waste	
Cook in sauce	41,000	<1,000	41,000	£130
Gravy	9,000	<1,000	9,000	£94
All other condiments, sauces, herbs & spices	83,000	2,000	84,000	£410
Total condiments, sauces, herbs & spices	**130,000**	**2,000**	**140,000**	**£630**

Columns or rows may not total due to rounding convention.

Table 44: Weight of edible parts of condiment, sauce, herb and spice waste (tonnes) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Cook in sauce	29,000	3,000	8,000	<1,000	<1,000
Gravy	<1,000	<1,000	8,000	<1,000	<1,000
All other condiments, sauces, herbs & spices	56,000	8,000	12,000	5,000	2,000
Total condiments, sauces, herbs & spices	**86,000**	**12,000**	**27,000**	**5,000**	**3,000**

Columns or rows may not total due to rounding convention.

5.8.4 Oil and Fat

This group excludes fats (and juices) generated by the cooking of meats in the home; also excluded is oil drained from tins of fish, olives, etc.

UK households produced 73,000 tonnes of oil and fat waste in 2012. 70,000 tonnes of this was food and cost £170 million. Approaching three quarters of the wasted food was discarded due to not being used in time, mainly referring to oils.

Table 45: Oil and fat waste in 2012 by type, split by wasted food / inedible parts and the cost of wasted food

Food Type	Weight generated (tonnes)			Wasted food (£ million)
	Wasted food (edible parts)	Inedible parts	Total food waste	
Fat	11,000	<1,000	11,000	£32
All other (oil)	59,000	3,000	62,000	£130
Total oil and fat	**70,000**	**3,000**	**73,000**	**£170**

Columns or rows may not total due to rounding convention.

Table 46: Weight of edible parts of oil and fat waste (tonnes) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Total oil and fat	**56,000**	**<1,000**	**7,000**	**5,000**	**<1,000**

Results for the food types are omitted as too little information to quantify.

5.8.5 Confectionery and Snacks

All food waste in this category is recorded as food other than the shells from pistachios and other nuts, and chewing gum, which are classified as inedible parts.

A total of 61,000 tonnes of confectionery and snacks was thrown away by UK households in 2012. Nearly all of this was wasted food (59,000 tonnes) and cost £410 million. Close to half of the wasted food was discarded due to not being used in time.

Table 47: Confectionery and snack waste in 2012 by type, split by wasted food / inedible parts and the cost of wasted food

Food Type	Weight generated (tonnes)			Wasted food (£ million)
	Wasted food (edible parts)	Inedible parts	Total food waste	
Savoury snacks	21,000	1,000	22,000	£150
Sweet biscuits	18,000	<1,000	18,000	£84
Chocolate and sweets	18,000	<1,000	18,000	£160
All other confectionery and snacks	2,000	<1,000	2,000	£14
Total confectionery and snacks	**59,000**	**1,000**	**61,000**	**£410**

Columns or rows may not total due to rounding convention.

Table 48: Weight of edible parts of confectionery and snack waste (tonnes) in 2012 by type, split by reason for discarding

Food Type	Not used in time	Personal preference	Cooked, prepared or served too much	Accidents (contaminated, burnt or spoilt)	Other
Savoury snacks	6,000	10,000	3,000	2,000	<1,000
Sweet biscuits	7,000	5,000	1,000	3,000	2,000
Chocolate and sweets	13,000	3,000	<1,000	2,000	<1,000
All other confectionery and snacks	<1,000	<1,000	<1,000	<1,000	<1,000
Total confectionery and snacks	**27,000**	**18,000**	**5,000**	**7,000**	**2,000**

Columns or rows may not total due to rounding convention.

5.8.6 Other

This group includes unidentifiable food and drink waste and foods that do not fit into another category, e.g. baby food, liquids drained from cans and jars. Note that non-food items (medicines and pet food) have been removed from the dataset as they are not considered as human food.

This category largely contains mixed semi-solid food[48], which is considered to be an inedible part as a rule of thumb. The wasted food which is unidentifiable or from other mixed, canned and bottled food includes: drainings, baby food and other items such as food colouring.

UK households generated 390,000 tonnes of 'other' food waste in 2012. Almost 90% was classified as inedible parts.

Table 49: Other food waste in 2012 by type, split by wasted food / inedible parts and the cost of wasted food

Food Type	Weight generated (tonnes)			Wasted food (£ million)
	Wasted food (edible parts)	Inedible parts	Total food waste	
Mixed semi-solid food	1,000	250,000	250,000	£3
Drainings from canned food	20,000	97,000	120,000	£100
Remaining 'other'	21,000	<1,000	21,000	£76
Total 'other'	**43,000**	**350,000**	**390,000**	**£180**

Columns or rows may not total due to rounding convention.

[48] *This category has previously been reported as 'gunge'.*

There is insufficient wasted food to analyse the reasons for discarding for other food waste.

Appendix A: Amounts of food fed to animals

Food entering the household that is subsequently fed to animals is no longer classified as food waste. However, consistent with good practice, the amounts associated with this destination are presented in Table 50, as they may be useful in a range of circumstances.

Table 50: Food fed to animals by UK households in 2012, split by wasted food / inedible parts

Food Type	Weight generated (tonnes)		
	Wasted food (edible parts)	Inedible parts	Total
Bakery	78,000	<1,000	78,000
Meat and Fish	46,000	14,000	60,000
Fresh Vegetables and Salads	38,000	6,000	44,000
Meals (Home-Made and Pre-Prepared)	26,000	<1,000	26,000
Fresh Fruit	12,000	5,000	17,000
Dairy and Eggs	14,000	<1,000	14,000
Staple Foods	14,000	<1,000	14,000
Processed Vegetables and Salad	11,000	<1,000	11,000
Cake and Desserts	5,000	<1,000	5,000
Condiments, Sauces, Herbs & Spices	4,000	<1,000	4,000
Confectionery and Snacks	1,000	<1,000	1,000
Drink	<1,000	<1,000	<1,000
Processed Fruit	<1,000	<1,000	<1,000
Other	<1,000	<1,000	<1,000
Oil and Fat	<1,000	<1,000	<1,000
Total	**250,000**	**25,000**	**280,000**

Columns or rows may not total due to rounding convention.

Appendix B: Questionnaire questions

Preamble: A not-for-profit organisation that regularly reports on the amount of food thrown away in the UK is currently revising its definitions relating to food waste. To do this, it is finding out the opinions of the UK population.

Q1: Please look at the list of foods below. Which of these items do you eat, assuming they are appropriately cooked and in good condition?

Food item	I **always** eat this part of the item	I **often** eat this part of the item	I **occasionally** eat this part of the item	I **never** eat this part of the item	This is not relevant to me (for example, I don't buy this type of food)
Cooked chicken skin	□	□	□	□	□
Bacon rind / fat	□	□	□	□	□
Potato skin / peel	□	□	□	□	□
Carrot skin / peel	□	□	□	□	□
Parsnip skin / peel	□	□	□	□	□
Stalk of a head of broccoli	□	□	□	□	□
Stalk of a head of cauliflower	□	□	□	□	□
Outer leaves of a cabbage	□	□	□	□	□
Cabbage stem and hard centre	□	□	□	□	□
Apple core	□	□	□	□	□
Apple peel / skin	□	□	□	□	□
Zest from orange peel (the outer coloured part of the peel)	□	□	□	□	□
The rest of the orange peel (the white part)	□	□	□	□	□
End slices of a loaf of bread	□	□	□	□	□

Crusts of a slice of bread	□	□	□	□	□
Oil drained from a tin of fish	□	□	□	□	□

Q2: For the same list of foods, which of these items do you consider inedible and which could possibly be eaten, even if you don't eat them yourself? Again, please assume that the items are appropriately cooked and in good condition.

Food item	Edible under all circumstances	Usually edible	Usually inedible	Inedible under all circumstances	I have no opinion
Cooked chicken skin	□	□	□	□	□
Bacon rind / fat	□	□	□	□	□
Potato skin / peel	□	□	□	□	□
Carrot skin / peel	□	□	□	□	□
Parsnip skin / peel	□	□	□	□	□
Stalk of a head of broccoli	□	□	□	□	□
Stalk of a head of cauliflower	□	□	□	□	□
Outer leaves of a cabbage	□	□	□	□	□
Cabbage stem and hard centre	□	□	□	□	□
Apple core	□	□	□	□	□
Apple peel / skin	□	□	□	□	□
Zest from orange peel (the outer coloured part of the peel)	□	□	□	□	□
The rest of the orange peel (the white part)	□	□	□	□	□
End slices of a loaf of bread	□	□	□	□	□
Crusts of a slice of bread	□	□	□	□	□
Oil drained from a tin of fish	□	□	□	□	□

Q3: Do you make stock by boiling bones (e.g. chicken bones)?

- Yes
- No
- Don't know

Q4: (as if 'Yes' to Q3) You mentioned that you make stock by boiling bones. How often do you make stock?

- Every time that I have bones (for example, leftover from meat / carcases)
- More than half the time that I have bones
- About half the time that I have bones
- Less than half the time I have bones
- Rarely

Q5: How responsible are you for the preparation and cooking of food in your house, if at all?

- I have responsibility for all or most of it
- I have responsibility for about half of it
- I have responsibility for some, but less than half of it
- I'm not responsible for any of it

Appendix C: Classifying items using survey results

To determine the degree to which item is perceived as edible food or an inedible part, the results from each question were analysed through the following process:

A: Excluding anyone giving the final response option to each question: 'This is not relevant to me' for Q1, 'I have no opinion' for Q2.

B: For the remaining responses, a score is applied to each response option. For the first response option ('I always eat this part of the item' for Q1, 'Edible under all circumstances' for Q2), the score is 1. For the second response option, the score is 2/3rd, the third option 1/3rd and 0 for the forth option.

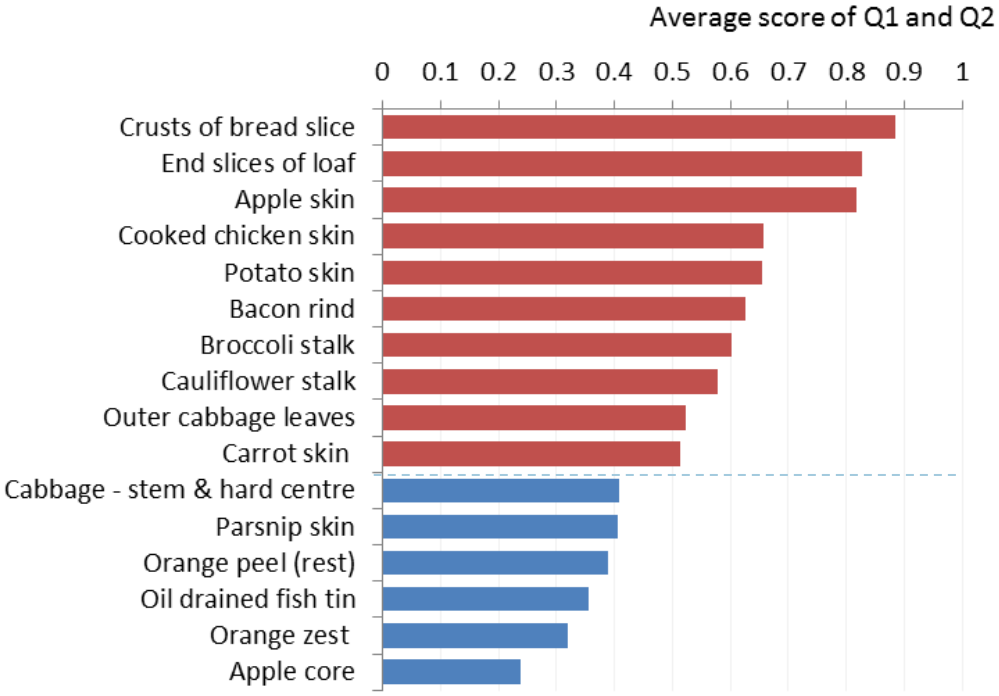
C: For each question, the average score is calculated for each item.

D: The scores for each item are averaged over the two questions to produce a single score. A high score indicates that an item is seen as edible, a low score is seen as inedible.

E: A threshold of 0.5 is applied – items with a score higher than this value are classified as food; items with a score below this are classified as inedible parts. The choice of this value as the threshold means that the classification reflects the majority view of the population.

It can be seen in Figure 30 that there is a natural break in the results around the 0.5 threshold; no item being classified as inedible scores above 0.41. In contrast, carrot skins and outer cabbage leaves are both very to the threshold (0.51 and 0.52 respectively).

Figure 30: Overall score using question 1 and 2 used to determine which items are classified as food and which as inedible parts



Appendix D: Classification of food, inedible parts and out of scope

The table below shows what is covered in each food category and within that, which parts of items are food or inedible parts. Shaded cells indicate categories with poor precision around the estimate (see Section 2.4). These categories have been reported as part of 'all other *food group*' in the tables presented in Chapter 5.0. Items/parts of item in **red** were asked about directly in the survey described in Section 2.1.2 and shown in Appendices A & B. Food categories are presented in the order of the equivalent sections in Chapter 5.0.

Food Type	Food	Inedible Part	Comment	Food	Inedible part	Comment	What it doesn't include
Vegetables							
	Fresh			**Processed**			
Aubergine	Aubergine, peel	Stem/end		Not found			
Baked beans		n/a		Baked beans			
Bean (all varieties)	Skin	Ends	Assumed runner beans when no more information on type of bean	Butter beans, chickpea, green, haricot, kidney beans, runner; canned, frozen			Drainings from the tin
Broccoli	Floret, stem, leaves		Leaves similar in nature to outer leaves of a cabbage	Frozen			
Cabbage	Cabbage, outer leaves	Hard stem/centre		Pickled			

Food Type	Food	Inedible Part	Comment	Food	Inedible part	Comment	What it doesn't include
Carrot	Carrot, peel	Tops		Frozen, pre-prepared, tinned			Drainings from the tin
Cauliflower	Cauliflower, outer leaves, stem		Leaves similar in nature to outer leaves of a cabbage	Pickled			
Celery	Celery, leaves	Ends, heart	Heart similar in nature to cabbage centre	Pre-prepared			
Coleslaw*	n/a			Coleslaw			
Courgette	Courgette, peel	Ends	Peel similar in nature to carrot peel, common year-round salad vegetable, but less likely to be dirty	Not found			
Cucumber	Cucumber, peel	Ends		Not found			
Hummus*	n/a			hummus			
Leafy salad	Mixed leafy salads, rocket, watercress/ cress	Stalks/ends		Not found			Lettuce as a single item
Leek	Leek, outer leaves, trimmings	Base/end	Outer leaves similar in nature to outer leaves of a cabbage	Not found			

Food Type	Food	Inedible Part	Comment	Food	Inedible part	Comment	What it doesn't include
Lettuce	Lettuce, outer leaves	Base/end	Outer leaves similar in nature to outer leaves of a cabbage	Not found			
Mixed vegetables	Mixed vegetables and peels, leaves, stir fry		Assumed peel is more (like) carrot peel than parsnip peel. Leaves assumed to be like outer leaves of a cabbage	Frozen, pre-prepared, mixed stir fry vegetables			
Mushroom	Mushrooms, skins, stalks, ends		Ends are usually sold trimmed	Not found			
Non-leafy salad	Beetroot salad, mixed non-leafy salad			Mixed prepared salads, potato salad; takeaway,			
Onion	Onions, shallots	Ends, skin		Pickled, rings, dried			
Pea (all varieties)	Garden, mange tout, sugar snap	Pods		Frozen, mushy, tinned			
Pepper	Peppers	Core, seeds, top/stalk		In jar, takeaway			Chilli peppers
Potato	Potatoes, peel; baked, boiled, chips (if specified home-made), mashed, roast, uncooked	Sprouts		Chips, hash browns, potato waffles; packaged, pre-prepared			

Food Type	Food	Inedible Part	Comment	Food	Inedible part	Comment	What it doesn't include
Spinach	Spinach (including pre-washed/ bagged), stems			Frozen, tinned			
Vegetable based sandwich spread	n/a			Any vegetable based sandwich spread or pate			
Spring onion	Spring onion, outer leaves	End	Outer leaves similar in nature to outer leaves of a cabbage	Not found			
Sprout	Sprout	Outer leaves, stem	Outer leaves similar in nature to parsnip peel (seasonal veg prepared for cooking)	Frozen			
Sweetcorn / corn on the cob	Baby corn, corn on the cob	Core, leaves		Sweetcorn; canned, frozen			Drainings from the tin
Tomato	Tomatoes, skins	Stalks		Passata, puree, sundried, tinned			Drainings from the tin
Other vegetables and salad	Greens, rhubarb, seeds, squash, ends e.g. asparagus	Core e.g. pak choi		Frozen greens, gherkins, lentils, Quorn, textured vegetable protein, soya, water chestnuts			Drainings from the tin
Other root vegetables	Beetroot, celeriac, parsnip, radish, swede, sweet potato, turnip	Peel	Considered peel to be similar in nature to parsnip peel	Pickled beetroot			

Food Type	Food	Inedible Part	Comment	Food	Inedible part	Comment	What it doesn't include
**Coleslaw and hummus were reported in the same category in a previous report but are reported separately here.*							
Drink							
Bottled water	Bottled water, flavoured water; carbonated or still						Tap water
Carbonated soft drink	Cola, cream soda, dandelion and burdock, energy drinks, fruit-based soda, ginger beer, lemonade, limeade						Carbonated water
Coffee	Coffee grounds, instant coffee granules						Water used to make coffee
Fruit juice and smoothies	Fruit juices, tomato juice, smoothies						Lemon juice*
Hot chocolate	Both powder and liquid form						
Lager, beer and cider	Ale, cider, lager, stout						
Milkshake and milk drink	Flavoured milk, milkshake, milkshake powder (and milk if used to constitute), soya milk						Milk (except where used to constitute)

Food Type	Food	Inedible Part	Comment	Food	Inedible part	Comment	What it doesn't include
Squash	Squash						Water added to squash
Tea waste	Black, green, herbal teas; milk and sugar added to tea that is disposed of						Water used to make tea
Wine	All wines						
Other alcohol	Alcopops, spirits, spirits with mixers						
Other drinks	Protein drinks, sports drinks, 'coffeemate'						

**Lemon juice is reported in the 'Other condiments' category.*

Fruit							
	Fresh			**Processed**			
Apple	Apple, peel	Core, stem		Cooked apple and 'snack' packs			Apple juice*
Banana	Banana	Skin		Battered and dried banana			Plantain
Kiwi	Kiwi	Skin		Not found			
Melon	Melon, watermelon	Rind/skin, seeds		Shop prepared			
Mixed fruit	Fresh fruit salad	Peel	Assumed to be rarer fruit if unidentified	Dried mixed peel, packaged fruit salads			

Food Type	Food	Inedible Part	Comment	Food	Inedible part	Comment	What it doesn't include
			and therefore have inedible peel				
Orange	Clementines, mandarins, oranges, satsumas	Peel, zest		Not found			Orange juice*
Pear	Pear, peel	Core	Pear peel similar in nature to apple peel	Tinned pears			
Pineapple	Pineapple	Skin, top		Tinned and prepared pineapple			
Soft / berry fruit	Blackberries, blueberries, grapes, raspberries, redcurrants, strawberries	Stems		Frozen strawberries, raisins, sultanas, mixed berry fruit			
Stone fruit	Apricot, avocado, cherry, damson, mango, nectarine, peach, peel, plum	Stones, avocado skin, mango skin, stems		Dates, dried apricots, glace cherries, prunes, tinned peaches			
Other citrus	Grapefruit, lemon, lime	Peel, zest	Peel and zest similar to orange peel and zest	Tinned grapefruit			**Lemon juice
Other fruit	Coconut, fig, guava, lychee, papaya, passion fruit, pomegranate, unknown fruit	Skin/Shell		Desiccated coconut, dried figs, tropical fruit mix			

Food Type	Food	Inedible Part	Comment	Food	Inedible part	Comment	What it doesn't include
**Fruit juices are reported as drinks under the 'fruit juice and smoothies' category.*							
***Lemon juice is reported in the 'Other condiments' category.*							
Meat and fish							
Pork / ham / bacon	Bacon, gammon, ham, jelly, pork chops, rinds, skin, sausages, spare ribs, fat, crackling	Bones, gristle					Sausages identified as meat other than pork
Beef	Beef, burgers, corned beef, mince, roast beef, steak, fat, drippings	Bones, gristle					Burgers or mince identified as meat other than beef, veggie burgers
Fish and shellfish	All fish, all shellfish (molluscs and crustaceans), breaded or battered fish, caviar, crab paste, crab sticks, fish skin	Bones, scales, heads, guts, shells	Fish skin similar in nature to chicken skin				
Lamb	Lamb, lamb kebab, fat	Bones, gristle					
Poultry (chicken / turkey / duck)	Chicken, breaded chicken products, chicken wings, duck, fat, goose, giblets, skin, turkey	Bones, cartilage, carcass with no/almost no meat on it					
Meat and fish based sandwich spread	Sandwich fillers containing meat or fish, pâté						

Food Type	Food	Inedible Part	Comment	Food	Inedible part	Comment	What it doesn't include
Bone (unidentifiable / mixed)		Mixed bones, unidentified bone					
Game	Venison						
Other meat (unidentifiable / mixed meat / offal)	Black pudding, unidentified fat, hot dogs, jelly, kebab meat, kidney, liver, meatballs, mixed meat, speciality sausages, unidentified meat						
Bakery							
Cracker / crisp bread	Savoury biscuits, crackers, sesame toast, rye bread and crackers, rice cakes						Sweet biscuits
Breadsticks	Breadsticks						
Dough	Bread dough (cooked or uncooked), dough balls						Pizza crusts
Dumplings	Dumplings, dumpling mix						
Morning goods	Croissants, crumpets, oven bottom muffins, potato cakes, scotch pancakes, waffles						Danish pastries, hot cross buns, iced buns, potato waffles, scones

Food Type	Food	Inedible Part	Comment	Food	Inedible part	Comment	What it doesn't include
Pastry	Choux, Filo, puff, shortcrust, vol-au-vents						Pies
Speciality bread	Bagels, brioche, chapatti, ciabatta, focaccia, garlic bread, naan, paratha, pitta, poppadom, stottie, tortilla						
Standard bread	Granary, white, wholemeal; baguettes, loaves, rolls; crumbs, crusts, whole slices and pieces (including end slices); toasted or untoasted						
Yorkshire pudding and other batters	Batter mix, fish batter, pancakes, Yorkshire pudding						
Other bakery	Breadcrumbs (bought), bread mix, croutons, gluten free bread, pizza base, taco shells.						
Dairy and eggs							
Milk	Fresh, UHT and goats' milk						Soya milk, baby milk formula

Food Type	Food	Inedible Part	Comment	Food	Inedible part	Comment	What it doesn't include
Cheese	All cheese including goats' and sheep's cheese, cheese rind	Cheese wax	Rind similar in nature to bacon rind				
Cream and crème fraiche	Clotted cream, cream, crème fraiche, sour cream						
Egg	Egg white and yoke (chicken, duck etc.)	Shells					Fish eggs
Yoghurt / yoghurt drink	Fromage frais, yoghurt, yoghurt drinks						
Other dairy	Evaporated milk, milk powder, whey						
Meals							
	Home-made			**Pre-prepared**			
Soup	Home-made soup (where specified)			Packet or tinned soup			Stock
Composite meal	Meals assumed to be home-made unless they can be identified as pre-prepared. Also includes pre-prepared savoury products where combined with other ingredients in the home.			For example, curry and rice dishes, noodle dishes, pizza, pasta meals and ravioli, ready meals, spaghetti hoops, takeaway meals. Where identified by the tin or packaging.			

Food Type	Food	Inedible Part	Comment	Food	Inedible part	Comment	What it doesn't include
Sandwich	All other sandwiches are assumed to be home-made.			Where known to be pre-prepared due to packaging type / brand name			
Savoury products	Savoury products are assumed to be home-made unless they can be identified as pre-prepared. A similar range of foods are including to those shown in pre-prepared category.			A wide range of products including: bhaji, pakora, pies and pasties, pork pie, quiche, samosa, sausage roll, Scotch egg, unless stated home-made			
Cakes and desserts							
Cheesecake	Cheesecake						
Chocolate pudding / dessert	Chocolate desserts, chocolate pudding						
Cakes / gâteaux / doughnuts / pastries	Cake mix, cake, Christmas pudding, Danish pastries, doughnuts, éclairs, egg custard tarts, flapjack, fruit cake, gâteaux, iced buns, Indian cakes, malt loaf, profiteroles, scones, Swiss roll						

Food Type	Food	Inedible Part	Comment	Food	Inedible part	Comment	What it doesn't include
Fruit pie / strudel / crumble	Crumble, fruit pie, mince pies, strudel						
Ice Cream	Ice cream, ice lollies, sorbet						
Jelly	Jelly, both concentrated and constituted						
Milk pudding (custard etc.)	Custard, custard powder (and milk used to constitute), rice pudding						
Mousse	Mousse (including chocolate mousse)						
Trifle	Trifle						
Other desserts	Banoffee pie, bread and butter pudding, cake decorations, marzipan and icing, ice cream cones, fruit fools, meringue						
Staple foods							
Breakfast cereal	Commercial cereals, muesli, porridge oats; dry or with absorbed milk						Cereal/ breakfast bars (see **Confectionery and Snacks**)

Food Type	Food	Inedible Part	Comment	Food	Inedible part	Comment	What it doesn't include
Flour	Corn flour, flour						
Pasta	Gnocchi, noodles, pasta, takeaway noodles; cooked or dried						Pasta as part of a meal
Rice	Rice, including boil in the bag / express rice, takeaway rice; cooked or dried						Rice as part of a meal
Other staple foods	Couscous, semolina, tapioca; cooked or dried						Other staples as part of a meal
Condiments, sauces, herbs & spices							
Cook in sauce	Sauces ready to make meals, either home-made or pre-prepared						Sauces as part of a meal
Dip	Dip, guacamole, salsa, taramasalata						Hummus
Gravy	Either as liquid or powder / granules						Tap water used to constitute gravy
Herb / Spice	Powdered spices, fresh and dried herbs, ginger, garlic, chillies,	Skin e.g. garlic, ginger, some leaves e.g. bay, stalks, some whole 'herbs' e.g. lemongrass	Herbs/spices considered flavouring and therefore not equivalent to other				

Food Type	Food	Inedible Part	Comment	Food	Inedible part	Comment	What it doesn't include
			similar (edible) plants				
Honey	Honey						
Jam	Jam, marmalade						
Ketchup	Tomato ketchup only						Brown, barbeque and other sauces
Mayonnaise / salad cream	Mayonnaise, salad cream						
Olives	Olives	Brine	Brine considered preservative equivalent to oil drained from fish tin				Olive oil
Pickle	Lime pickle, piccalilli, pickle						Pickled beetroot, pickled onions
Salt	Salt						
Sugar	Granulated, icing, caster						Syrup
Sweet spread	Chocolate spread, golden syrup, lemon curd, peanut butter						
Other condiments etc.	All other sweet and savoury sauces, lemon						

Food Type	Food	Inedible Part	Comment	Food	Inedible part	Comment	What it doesn't include
	juice, vinegar, stock, syrup.						
Oil and fat							
Oil	Olive oil, flavoured oils, vegetable oils	Oil used for deep fat frying	Oil considered used for cooking into other food and therefore edible in absence of other information e.g. used (for deep fat frying).				
Fat	Butter, dripping, margarine, lard, suet						Fat from cuts of meat
Confectionery and snacks							
Chocolate and sweets	Chocolate bars, chocolate sweets, fudge, Indian sweets, mints, sweets						Chewing gum
Cereal bar	Cereal, brunch and breakfast bars						Flapjacks
Savoury snacks	Bombay mix, crisps, nuts, popcorn, prawn crackers, pretzels, savoury snacks, tortilla chips						Savoury products such as scotch eggs (see **Meals**)

Food Type	Food	Inedible Part	Comment	Food	Inedible part	Comment	What it doesn't include
Other confectionery and snacks	Fortune cookies, fruit and nut mix, yoghurt coated fruit	Chewing gum					
Sweet biscuits	Home-made and shop-bought sweet biscuits, including fig rolls, jaffa cakes, kitkats, shortbread etc.						Cheese biscuits, crackers, savoury biscuits
Other							
Baby food	Baby food						
Baby milk	Baby milk (formula)						Milk
Mixed semi-solid food		Food that was 'unpickable' during the compositional analysis and includes food that has decomposed and is no longer identifiable. It also contains semi-liquid material from meals. These materials were often found mixed together. This category was previously known as 'gunge'.	In the absence of identifiable information, this is conservatively considered inedible				
Mixed food	Foods from more than one food group mixed together, but that aren't a meal						

Food Type	Food	Inedible Part	Comment	Food	Inedible part	Comment	What it doesn't include
Other food	Food colouring, gelatine, glucose powder, cake decorations						

Appendix E: Miscellaneous calculations

This section contains miscellaneous calculations based on the data in this report.

Average amount and cost of wasted food for a family with children
In previous reports[49], the amount and cost of food waste has been calculated for a family. For these calculations, a family was defined as any household containing children (under 18s). In 2012, it was found that the ratio of avoidable food waste between the average family and the average person was 3.53. This largely reflects the number of people in the average family.

In this report, the same ratio is used to estimate the amount and cost of wasted food. Similar to the previous report, the cost of wasted food is calculated by multiplying the weight by the average cost per tonne (for all types of households). The results can be found in Table 51.

Table 51: Amount and cost of wasted food for the average family with children in 2015[50]

	Wasted food (edible parts)	
	Weight (kg)	Cost (£)
Per year	270 kg	£810
Per month	23 kg	£67
Per week	5.2 kg	£15

For easy reference, the same figures for the average household and the average person are in the tables below.

Table 52: Amount and cost of wasted food for the average household in 2015

	Wasted food (edible parts)	
	Weight (kg)	Cost (£)
Per year	180 kg	£540
Per month	15 kg	£45
Per week	3.5 kg	£10

[49] WRAP. (2013a). Household Food and Drink Waste in the United Kingdom 2012. [online] available at: http://www.wrap.org.uk/sites/files/wrap/hhfdw-2012-main.pdf.pdf
[50] *All figures in tables in this appendix are quoted to 2 significant figures.*

Table 53: Amount and cost of wasted food for the average person in 2015

	Wasted food (edible parts)	
	Weight (kg)	Cost (£)
Per year	77 kg	£230
Per month	6.4 kg	£19
Per week	1.5 kg	£4.40

Equivalent number of meals wasted

One way to visualise the amount of food thrown away is to calculate the equivalent number of meals it represents. In previous reports[51], the amount of avoidable food waste was divided by the weight of an average main meal. This is assumed to be 424 grammes[52]. Table 54 shows equivalent data for wasted food (edible parts).

Table 54: Wasted food as expressed in the equivalent number of meals thrown away (2015 data)

	Equivalent number of meals			
	Total for UK	Per family	Per household	Per person
Per year	12 billion	645	433	183
Per month	990 million	54	36	15
Per week	230 million	12	8.3	3.5
Per day	33 million	1.8	1.2	0.50

Calculations of equivalent impacts (cars of the road)

This section contains a calculation to compare the impact of wasted food (edible parts) from UK households with vehicle emissions. This allows the relative scale of the emissions associated with food waste to be visualised.

In 2015, there were 30.3 million cars licensed in Great Britain[53]. Annual Greenhouse Gas emissions from private cars and taxis in 2015 were 69.1 million tonnes CO_2e[54]. This gives a figure of 2.28 tonnes CO_2e per vehicle. Thus, emissions associated with wasted food (edible parts) are equivalent to around 32% of those from private vehicle journeys in the UK. This can be expressed more conservatively as equivalent to the emissions of around 1 in 4 cars on UK roads.

[51] WRAP. (2013a). Household Food and Drink Waste in the United Kingdom 2012. [online] available at: http://www.wrap.org.uk/sites/files/wrap/hhfdw-2012-main.pdf.pdf

[52] *As described in* http://www.wrap.org.uk/sites/files/wrap/Expressing%20redistributed%20food%20surplus%20as%20meal%20equivalents%20%28WRAP%20guidance%29.pdf

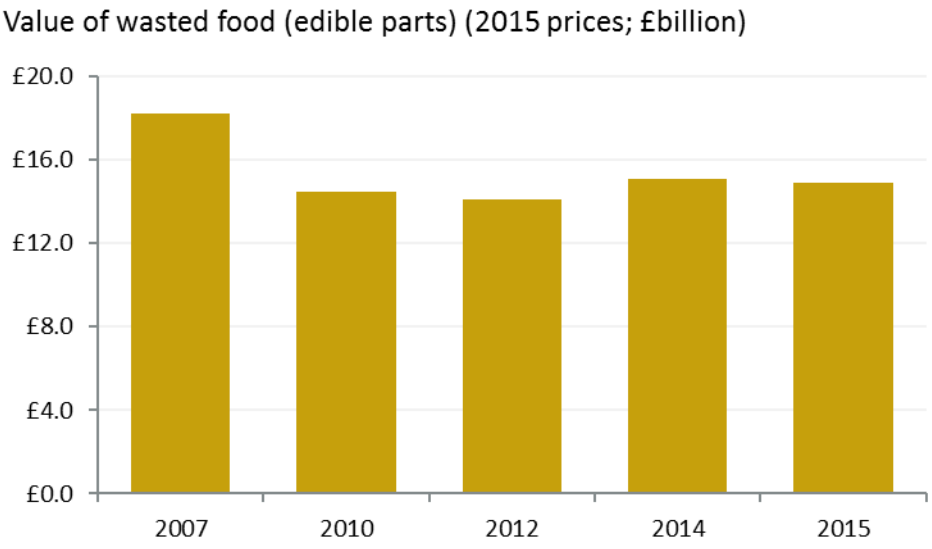
[53] *TSGB0906 - Licensed cars, by region, Great Britain, annually from 2000*

[54] *TSGB0306 - Greenhouse gas emissions by transport mode: United Kingdom*

Comparison of cost of wasted food 2007-2015

This report focuses on weight as the primary measurements for displaying food waste. Financial cost is used as an alternative. For those who wish to see the change in cost of wasted food across years, see Figure 31 below (normalised by 2015 prices). It is directly comparable to the weight figures in the report above since each total is calculated using the same cost per tonne of wasted food.

Figure 31: Value of wasted food produced by households in the UK, 2007-2015



Whole items thrown away per day (2012)

The total amount of food wasted by type is informative and useful for considering how the differing amounts wasted per item add up to a large weight of waste. However, it is also interesting to know how many items are thrown away whole and the data are available for some foods. The following items were estimated to have been thrown away untouched in the UK per day during 2012:

- 20,000,000 slices of bread (equivalent to 1,000,000 loaves at 20 slices per loaf)
- 4.4 million whole potatoes
- 920,000 (0.9 million) whole bananas
- 1.2 million whole tomatoes
- 720,000 (0.7 million) whole oranges
- 800,000 (0.8 million) whole apples
- 2.7 million whole carrots
- 970,000 (1.0 million) whole onions
- 86,000 whole lettuce
- 3.1 million glasses' worth of milk
- 2.2 million slices' worth of ham