



# Measuring Household Food Waste - The UK Experience

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**WRAP**

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# What I'll cover



1. Brief introduction of WRAP
2. Brief UK context
3. What do we know now?
4. What did we know when we set out?
5. How did we get from then to now?
6. What did we learn?
7. What's next
8. Questions and discussion



## Our vision

A world in which  
resources are used  
sustainably

## Our mission

To accelerate the move to a  
sustainable, resource-efficient  
economy through:

**Re-inventing** how we design, produce  
and sell products.

**Re-thinking** how we use and  
consume products.

**Re-defining** what is possible  
through re-use and recycling.



Food waste reduction



Sustainable Electricals



Sustainable Textiles




Waste as a resource

# WRAP and food waste prevention



**Final report**

### Estimates of waste in the food and drink supply chain




This report contains estimates for the amount of waste in the UK supply chain of food and drink. Estimates for 2011 are presented for food and drink manufacturing, grocery retail and wholesale, including waste food and drink and waste packaging.

Project code: WRAP1312/PAC010/008  
Research date: October - September 2013  
Date: October 2013

**Final report - Summary**


### Quantification of food surplus, waste and related materials in the grocery supply chain




Project code: C0201/001  
Research date: April 2013 to January 2015  
Date: May 2015

**Final Report**

### The True Cost of Food Waste within Hospitality and Food Service



Quantification of the true cost of food waste in the UK's hospitality and Food Service sector.



Project code: HFS01/015  
Research date: January 2013 to May 2013  
Date: November 2013

**Final report v2**

### The food we waste



A report of the ground-breaking data that provides, for the first time, credible estimates about the volume, amount and value of food waste produced in 16 households. The content of the report is based on direct observation, analysis and the best available secondary evidence, which has been used to help us to adjust the content of your report where we have gaps.

Project code: 02/001/010  
Research date: 11/2007 - 10/1/2007  
Date: April 2008 (version 1); May 2008

**Executive Summary**

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



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

Project code: CP010  
Research date: May 2012 - July 2013  
Date: November 2013

**Final report**

### Household Food Waste in the UK, 2015



This report provides estimates for total and avoidable household food waste for 2014 and 2015 for the UK. The changes compared to 2013 and previous estimates are discussed in the context of factors influencing food waste and the Courtauld 3 household food waste prevention target.

Project code: C0217/005  
Research date: September - October 2014  
Date: January 2015

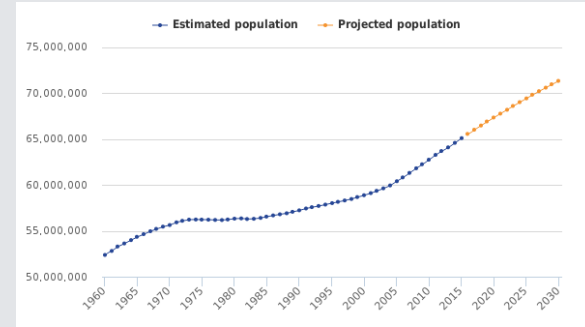


**THE COURTAULD COMMITMENT**



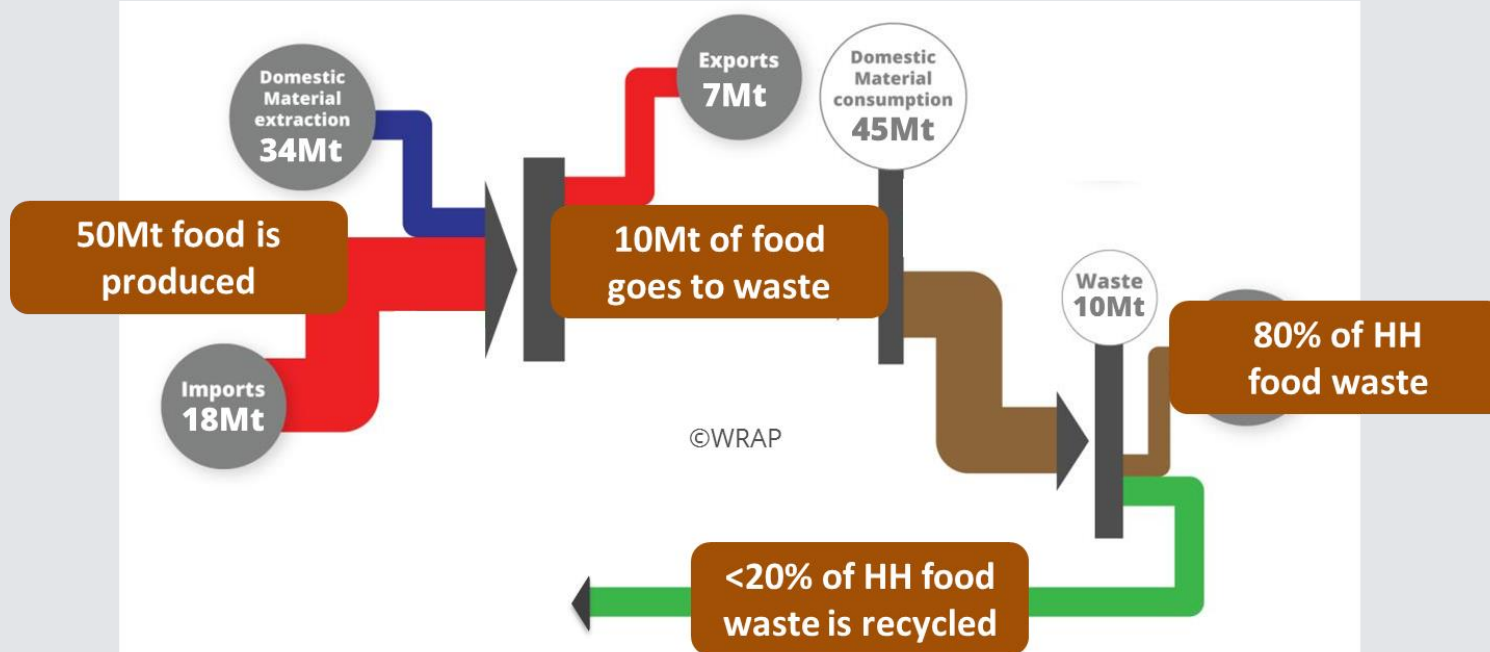
# The UK.....

- 65 million people
- Almost 27 million households
- Significant demographic changes
- Four nations
- Different national policies on food waste
- Different local approaches





# The UK.....



# What I'll cover



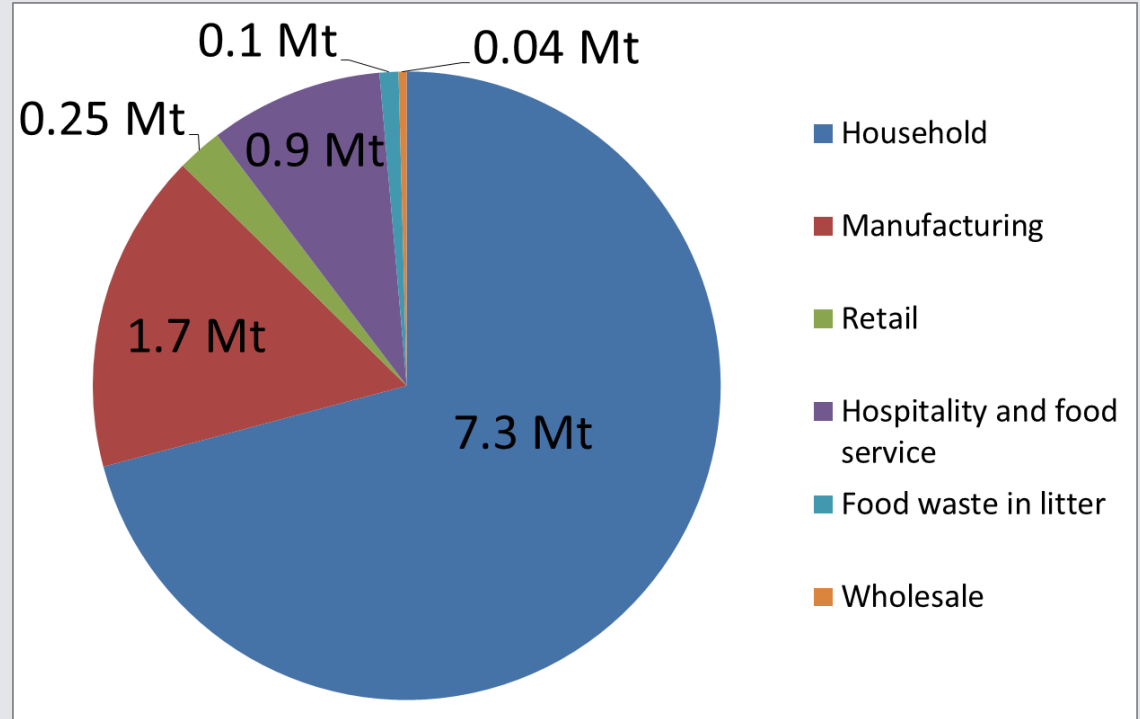
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# What do we know now? – UK food waste



- The amount of food being wasted post-farm gate in the UK is around 10 Mt
- ca. 6 Mt is avoidable, worth >£17 billion a year
- 70% of UK food waste comes from households





# What do we know now? – Breakdown of HHFW

## Avoidable food waste:

- Costs £700 a year per average family
- Associated with 19 Mt of CO<sub>2</sub>e and 4% of the total UK water footprint
- Requires land >90% the size of Wales to produce
- Includes 13 billion “5 a day” portions

60% avoidable



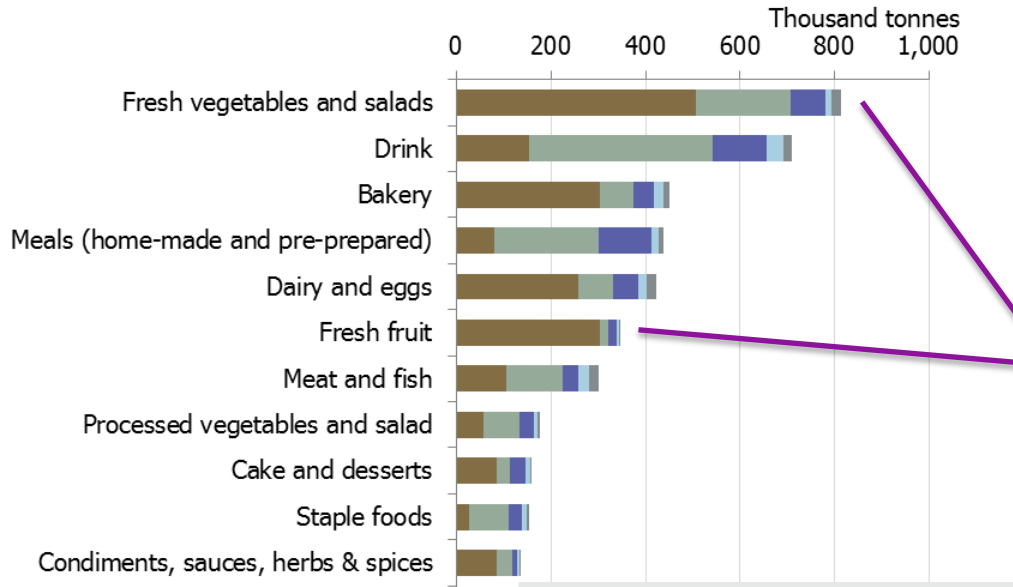
17% 'possibly' avoidable



23% unavoidable



# What do we know now? – Food types and reasons for household food being wasted



Not used in time (70%)



Cooked, prepared, served too much (19%)



Personal preference (8%)



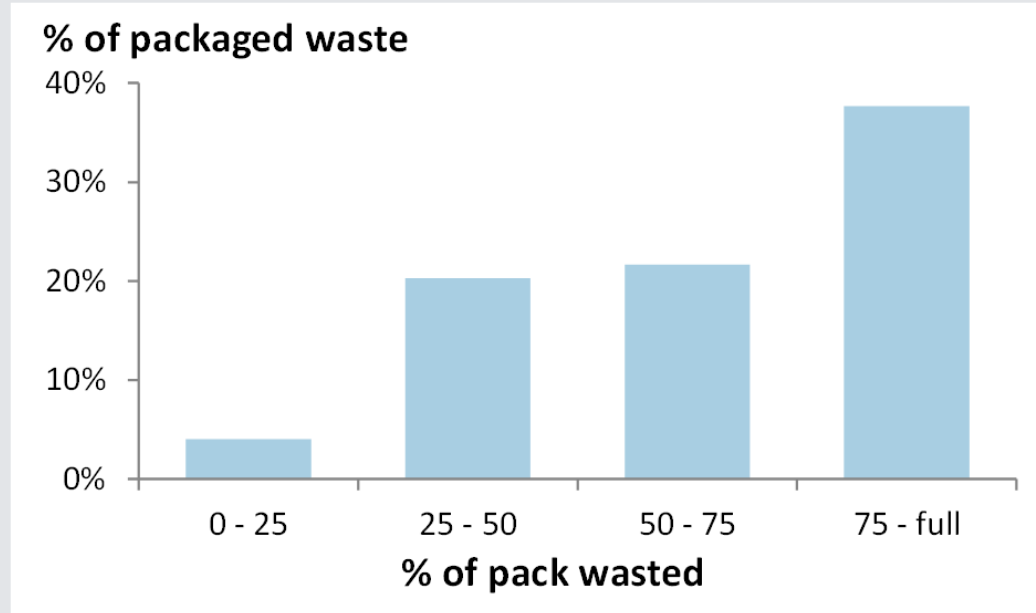
Accidents (1%)

Other (2%)

# What do we know now? – Granular data for key products

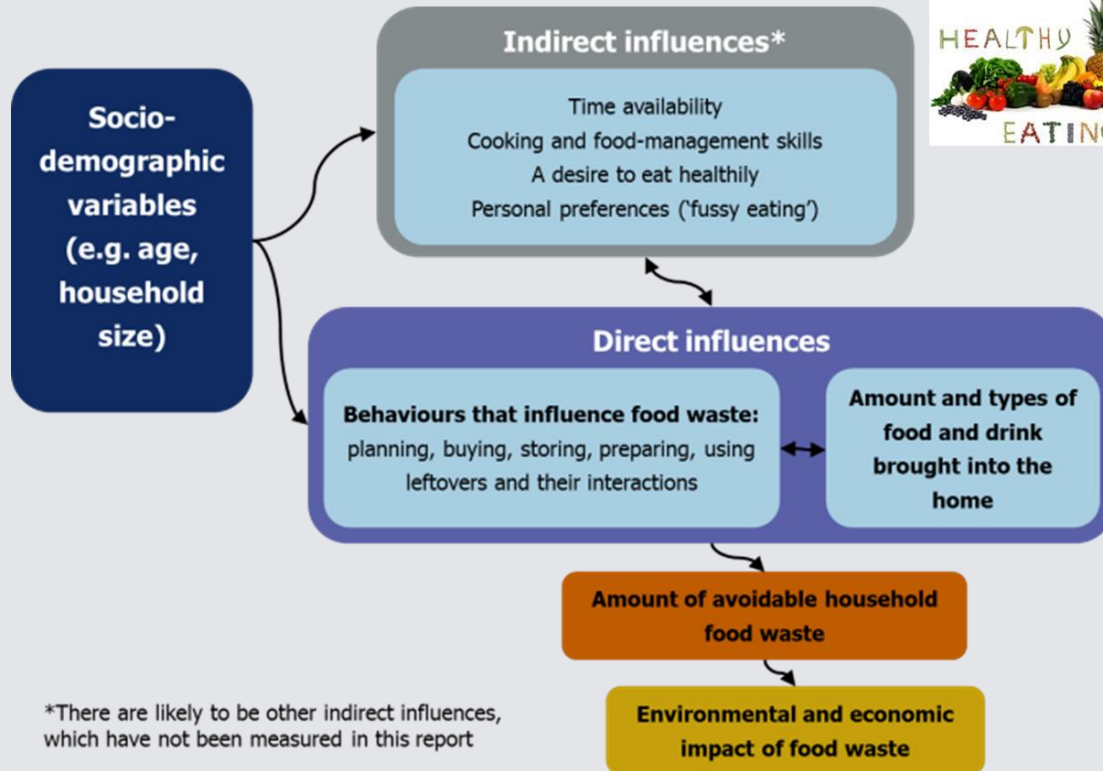


## *% weight of packaged leafy salad waste by amount left in pack*



*Source: Waste composition dataset*

# What do we know now? – Much more about people....



\*There are likely to be other indirect influences, which have not been measured in this report

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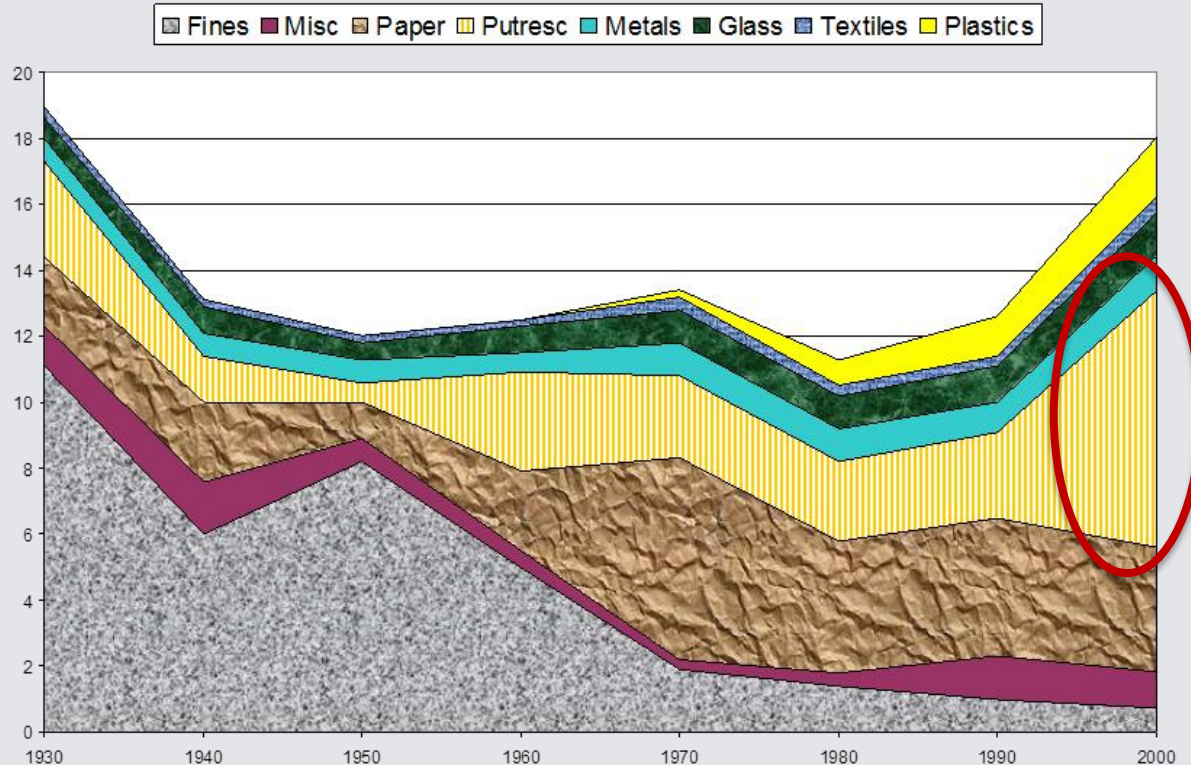
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# What did we know when we set out? Dustbin composition 1930-2000

In 2004/5:

- Food made up ca. 17% of all household waste
- 25-30% of collected waste

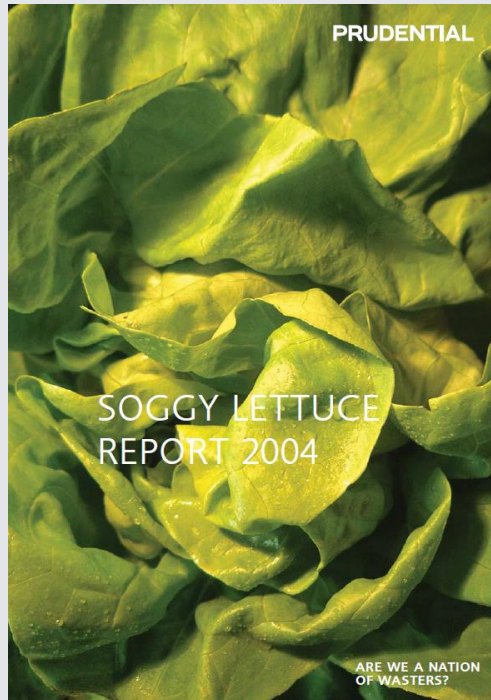




# What did we know when we set out? Self-reported food waste - 2004



£424 food waste per person per year



## SHOPPING LIST OF SHAME

% of people who throw the item away  
in an average week

Lettuce / bag of salad	61%
Loaf of bread	60%
Fruit	57%
Pint of milk	45%
Cooked meat	43%
Packet food e.g. biscuits	42%
Spreads and dips	37%
Cheese	33%
Prepared meals	24%
Fresh meat and fish	23%
Unfinished bottle of wine	17%

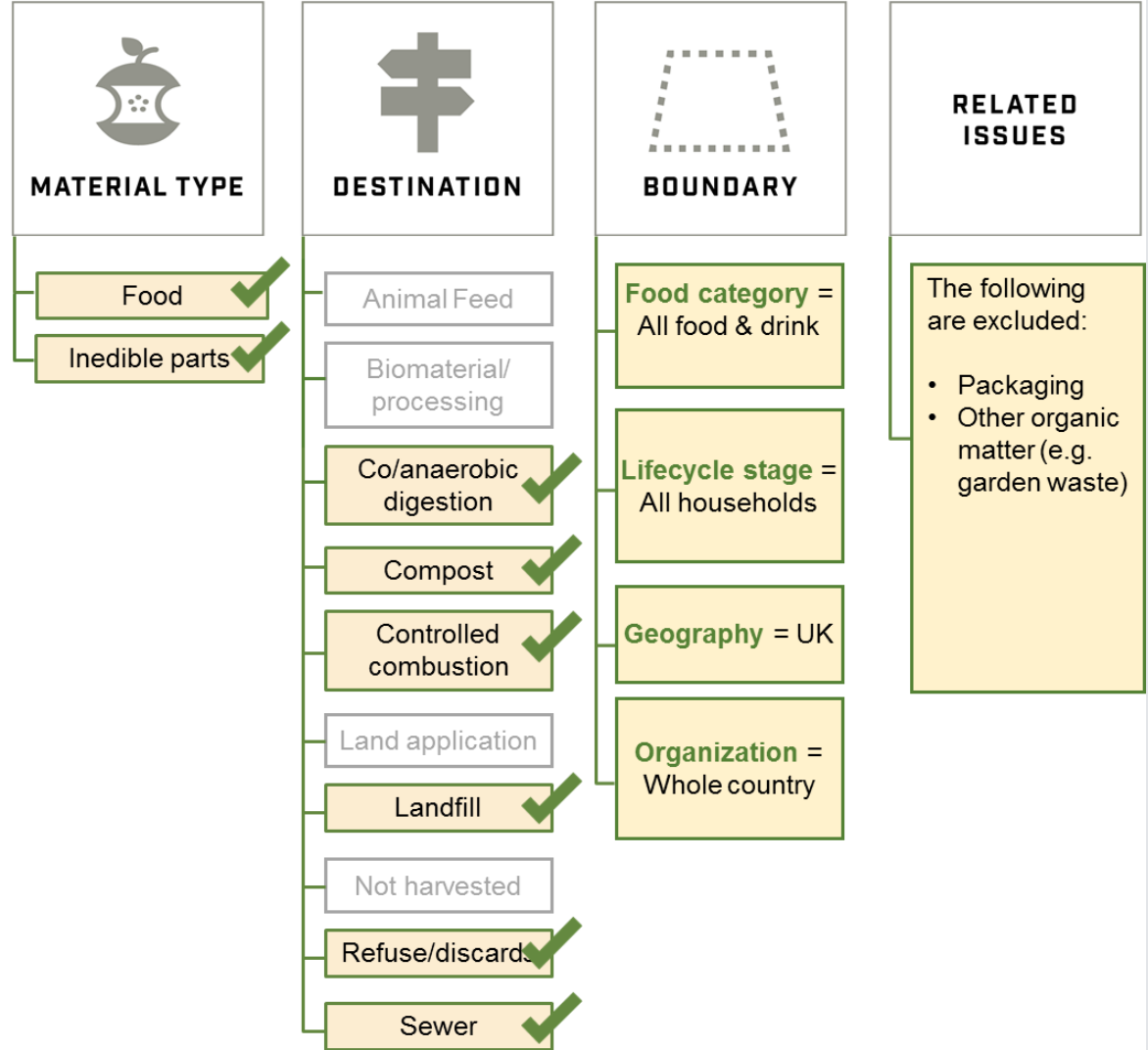
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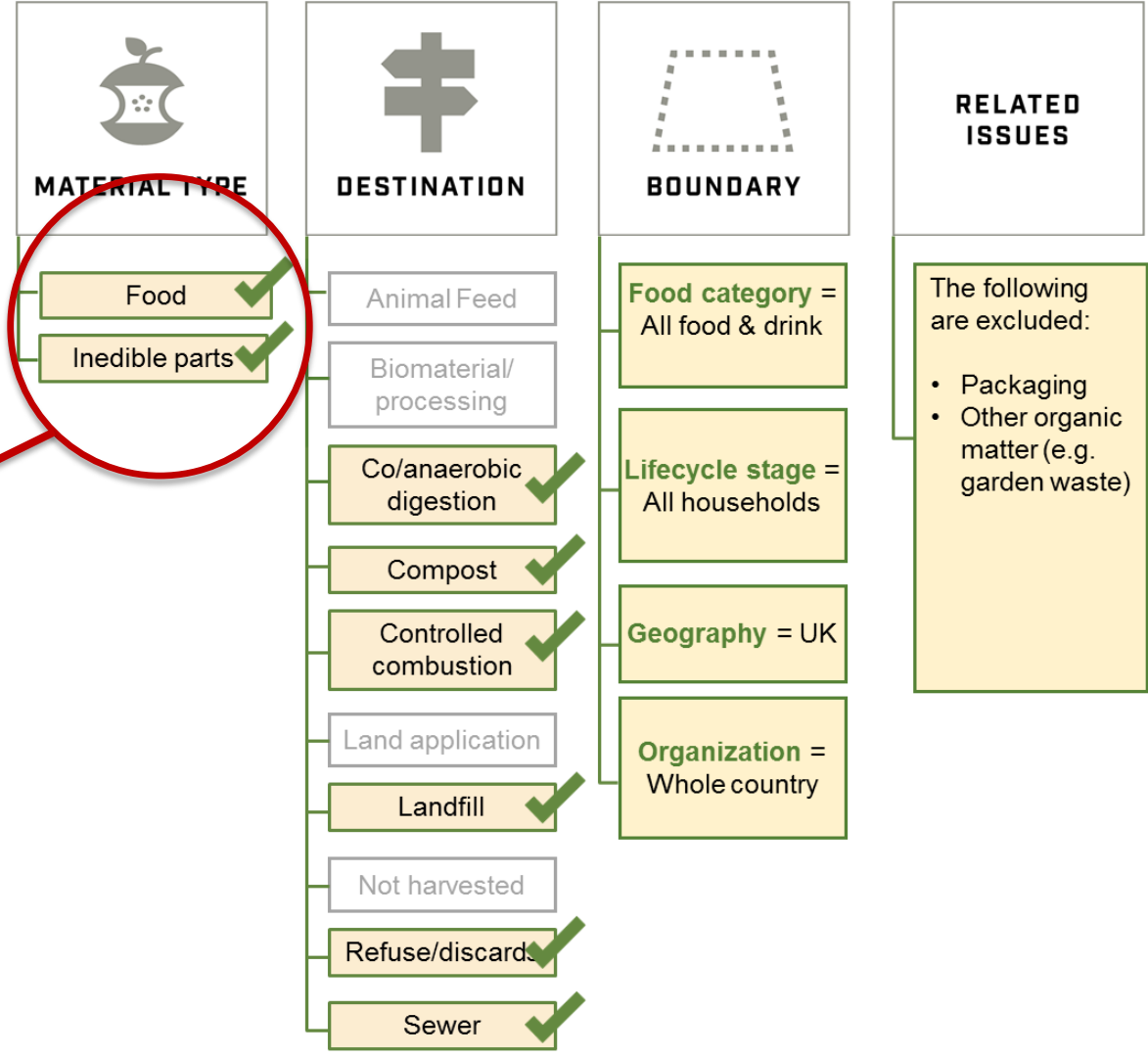
# Being clear on what was needed



# Being clear on what was needed

WRAP defined this as:

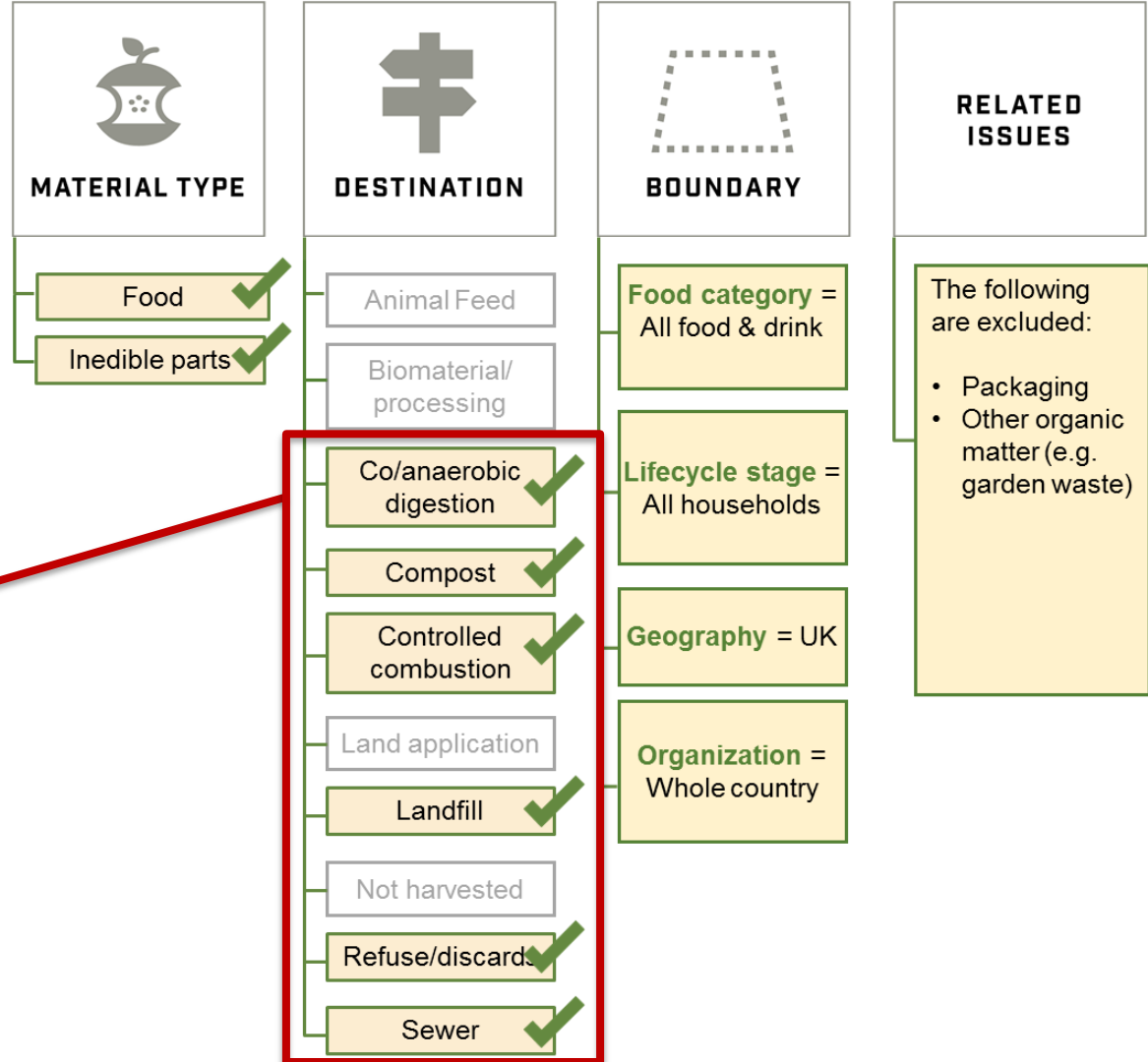
- Avoidable and potentially avoidable
- Unavoidable



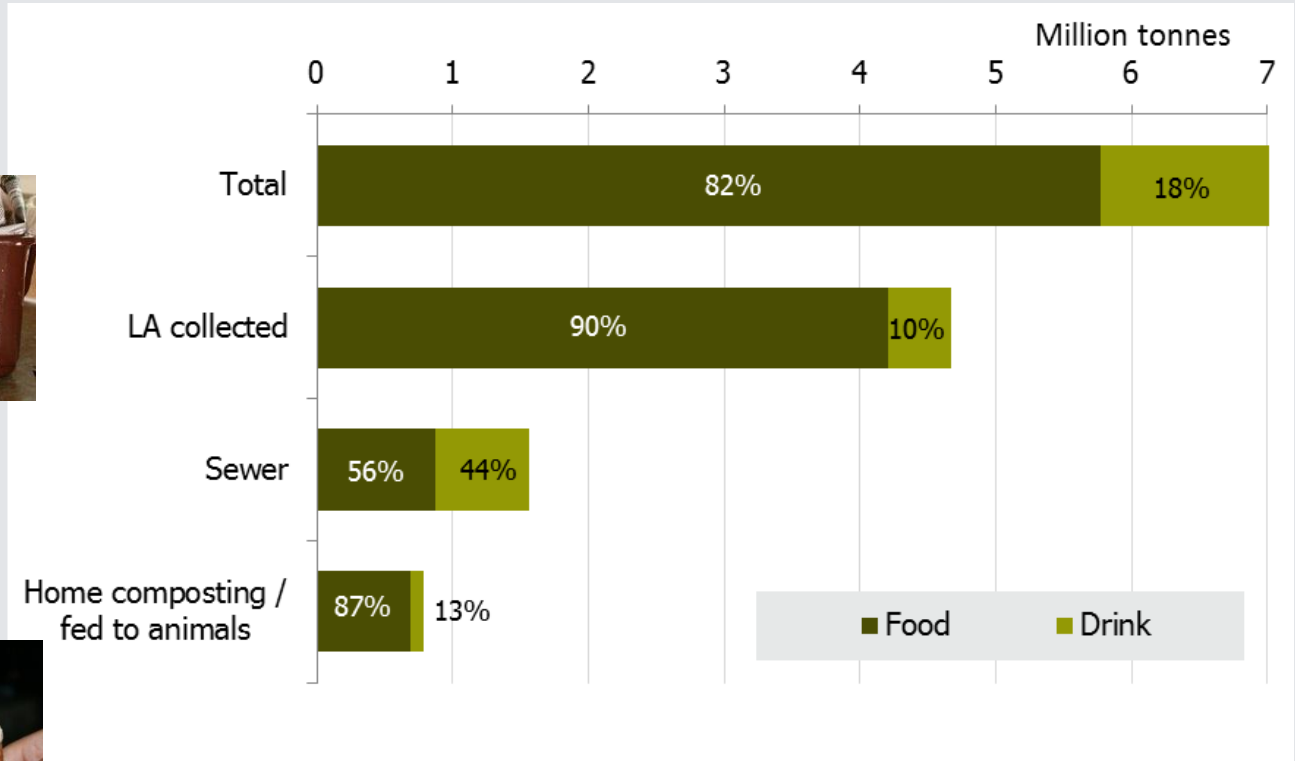
# Being clear on what was needed

Included food waste:

- Collected in the general / residual bin
- Collected separately
- Disposed of via the sewer
- Home composted
- [Fed to pets/animals]

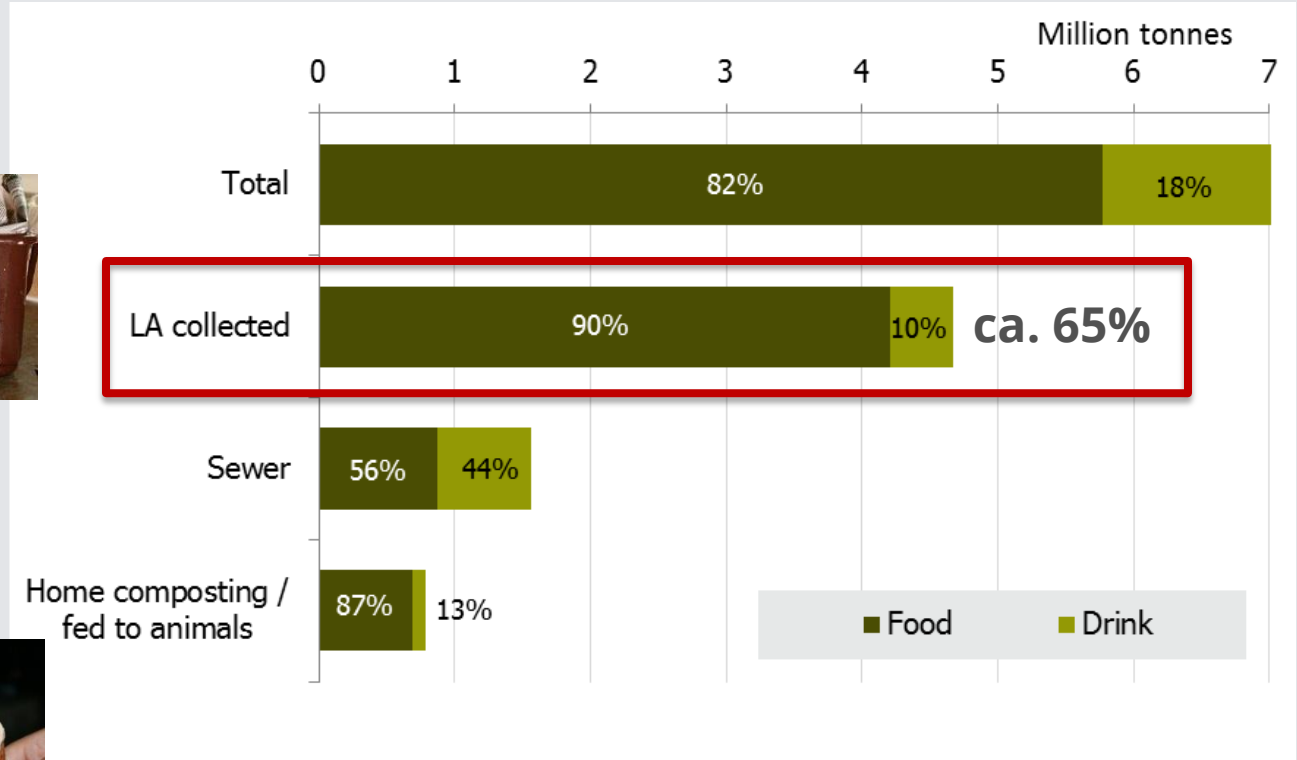


# Destinations for HHFW (2012)





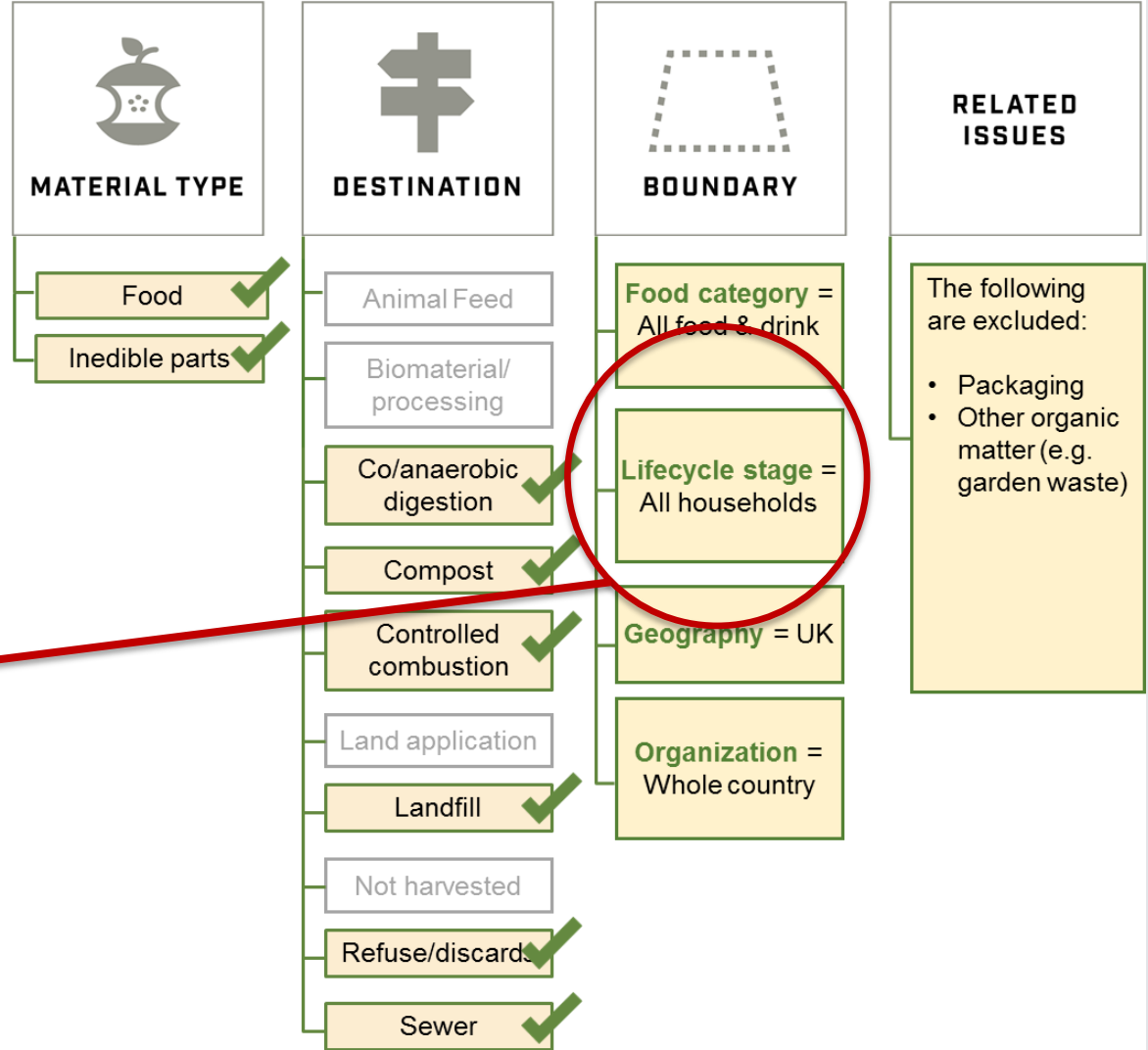
# Destinations for HHFW (2012)



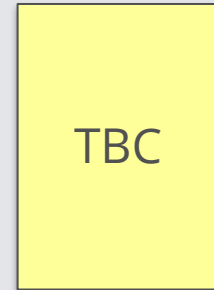
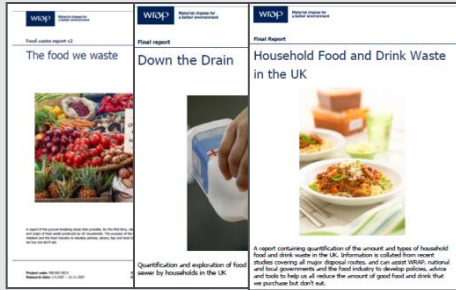
# Being clear on what was needed

NOT including:

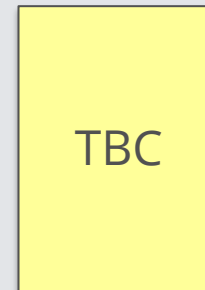
- Out of home (workplace & school lunches, meals out)
- Food waste in litter



# Approach to measuring HHFW in the UK



2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019



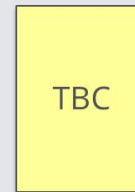
# Approach to measuring HHFW in the UK



Large-scale bespoke primary research  
(compositional analysis; diaries, surveys)



2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019



# Approach to measuring HHFW in the UK



Large-scale bespoke primary research  
(compositional analysis; diaries, surveys)



Synthesis of data from secondary sources / modelling

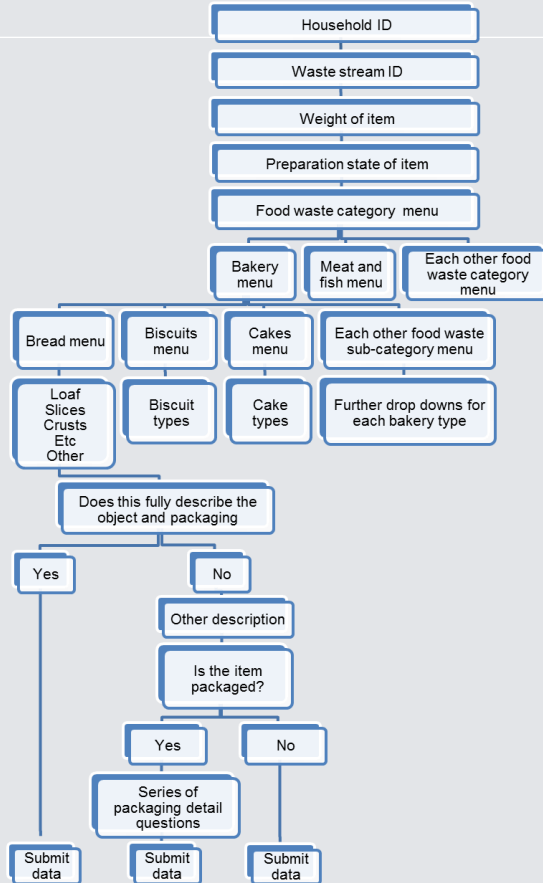
# Bespoke research – Compositional studies/household survey



% of HHFW destinations covered	Ca. 65% (food placed in main / separate bins)
Complexity	Medium to high
Number of households	1,800 to 2,000
Level of uncertainty	Relatively low (3-4%)
Time to complete	6-9 months
Costs	Relatively high (€350,000 – €500,000)
Outputs	Highly granular data (food types, <i>state</i> etc.), link to information on households (demographics, behaviours etc.)
Main advantages	Detailed data on what is <i>actually</i> disposed of; provides invaluable detail on which to design effective interventions
Main disadvantages	Investment required (financial, time); excludes some disposal routes



# Bespoke research – Compositional studies



# Bespoke research – Diaries



% of HHFW destinations covered	Up to 100%
Complexity	Medium
Number of households	200 - 300
Level of uncertainty	Relatively high (ca. 12 - 20%)
Time to complete	6-9 months
Costs	Relatively high (€200,000 – €250,000)
Outputs	Granular data (food types, <i>reasons for disposal</i> etc.) link to information on households (demographics, behaviours etc.)
Main advantages	Can cover all food and drink thrown away, provides invaluable detail on which to design effective interventions
Main disadvantages	Relies on self-reporting which leads to significant under-reporting (up to 40%), investment required (financial, time)

# Bespoke research – Diaries



**wrap** Working together for a world without waste

Household Food and Drink Waste Diary

10-16 May 2012

**BEFORE YOU START THE DIARY.....**  
Please provide the following information so we can send the £50 to you on receipt of your completed diary.

YOUR NAME & SURNAME: Mr/Mrs/Ms/Ms/Dr (please delete as applicable)

FULL ADDRESS:

POSTCODE:

TELEPHONE NUMBER:

Number of adults (18 years & over) in household:

Number of children (under 18 years) in household:

Please return this completed booklet (including this page) in the freepost envelope provided to Exodis Research by 28 May 2012 (see page 36 for details).



## How to record the amount of food and drink waste

It is really important that the amount of waste thrown away is recorded in this diary as accurately as possible. We have provided you with some measuring cups/spoons to help you measure waste items, but please feel free to use your own scales or other standard measuring containers but remember to write in the unit used (e.g. litre, gram, ounces).

Waste items can be whole items or loose; if the item is in a container (such as a bottle or carton) please only record the weight or amount of the food or drink and not the packaging; usually you will find the net weight of the item on the packaging (so a litre of cola is the weight of the cola excluding the bottle). The following boxes describe how you might estimate the amount of waste for whole and loose waste:

Examples of 'WHOLE GOODS' are a fish finger, a slice of bread, a bar of chocolate, an a meat joint, a leg of chicken, a cheese sandwich, a sausage, a banana, a used tea bag bottle of soda. For whole food items, you can weigh the item using kitchen scales or in how much is being thrown away using the scale:

- A whole
- Half
- A quarter
- Less than a quarter

But please remember to say how much the whole item was (e.g. half a 100g Cadbury Double Decker bar)



A whole apple



Half an apple



A quarter of an apple



Less than a quarter (core)



Weight (g, oz)

Examples of 'LOOSE GOODS' are foods that were originally in a container such as baked beans, pasta, rice, cereal, soup or yoghurt. It also includes waste such as fruit and veg peelings and bread crusts. For loose food items, please use the measuring jugs/spoons provided or your own scales to estimate the amount being thrown away.



Volume (litre, pint, oz)



Weight (g, oz)



A tablespoon



A teaspoon

## EXAMPLE OF COMPLETED ENTRIES: Morning meal

BREAKFAST/MORNING: FOOD																
If no waste, please say why: All food consumed <input type="checkbox"/> ; No meal prepared <input type="checkbox"/> ; OTHER (write in) _____																
WHAT? Give a full description of the food or drink waste including brand	TYPE? How was it originally purchased?					PACK SIZE? What was the original pack size?	STATE? Was it prepared or cooked when thrown away?		HOW MUCH? What is the weight, volume, quantity or amount?	WHERE? Please tick where it was thrown away (or write in)				WHY? Give the reason for disposal (e.g. out-of-date, too much served, mouldy, too salty, burnt, etc.		
	Frozen	Dried	Loose	Pre-packaged	Takeaway		As purchased	Other (write in)		General waste bin	Council food waste bin	Skew	Home compost		Feed to animal	Other (write in)
Porridge – Oat so Simple sweet cinnamon – made with skimmed milk		X				Pack of 10 sachets		X		Half a bowl		X				I was in a hurry to get to work so didn't have time to finish it all
Rind from a rasher of bacon			X			Pack of 8 rashers		X		3g				X		I am trying to eat less fat
Tesco Finest, smoked streaky Bread crusts from a toasted slice of Horvis white medium sliced loaf				X		Standard loaf		X		Crusts from one slice		X				My daughter doesn't like eating bread crusts
BREAKFAST/MORNING: DRINKS AND LIQUID FOODS																
If no waste, please say why: All drinks/liquids consumed <input type="checkbox"/> ; No drinks prepared <input type="checkbox"/> ; OTHER (write in) _____																
WHAT? Give a full description of the food or drink waste including brand	TYPE? How was it originally purchased?					PACK SIZE? What was the original pack size?	STATE? Was it prepared or cooked when thrown away?		HOW MUCH? What is the weight, volume, quantity or amount?	WHERE? Please tick where it was thrown away (or write in)				WHY? Give the reason for disposal (e.g. out-of-date, too much served, mouldy, too salty, burnt, etc.		
	Frozen	Dried	Loose	Pre-packaged	Takeaway		As purchased	Other (write in)		General waste bin	Council food waste bin	Skew	Home compost		Feed to animal	Other (write in)
Tea, PG Tips teabag with 3 tsp sugar & skimmed milk		X		X				X		1 cup			X			My son put too much sugar in – tasted horrible
Milk, Full fat Yeo Valley			X					X		10 oz				X		It tasted off

Household URN here

NEED HELP? CALL OUR DIARY SUPPORT TEAM ☎ 0800 0778427 4

# Synthesis of data from secondary sources [Local authority waste studies]

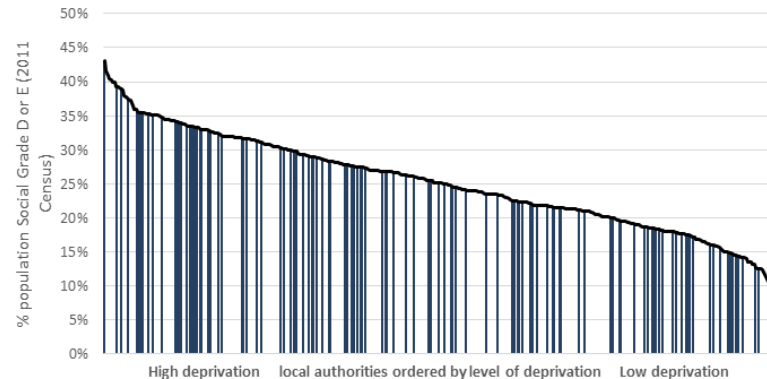


% of HHFW destinations covered	Ca. 65% (food placed in main / separate bins)
Complexity	Low to medium
Number of households	n/a [secondary studies ca. 150-300 households each]
Level of uncertainty	Relatively low (3-4%)
Time to complete	2-3 months
Costs	Relatively low (€25,000 – €35,000)
Outputs	Overall estimates of collected food waste; % main bin vs separate; potentially some detail on % food vs inedible parts
Main advantages	Low cost approach
Main disadvantages	Relies on availability of suitable secondary sources; lack of ability to control sample representativeness

# Synthesis of data from secondary sources

Target period for estimates	2007	2010	2012	2014	2015
No. of local authorities from which data included (out of a total for the UK of ca. 420)	120	87	63	87	116


**Figure 10:** Coverage of LAs performing compositional studies (levels of deprivation): UK – 2015 estimates



# Measuring household food waste - summary

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WasteDataFlow



Total collected national household waste  
[Residual; mixed organics; *food only*]

# Measuring household food waste - summary

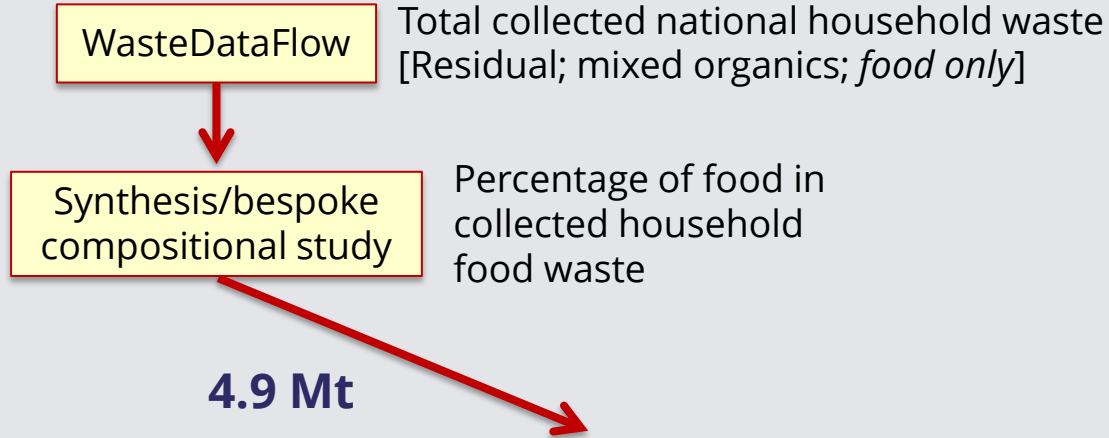
WasteDataFlow



Total collected national household waste  
[Residual; mixed organics; *food only*]

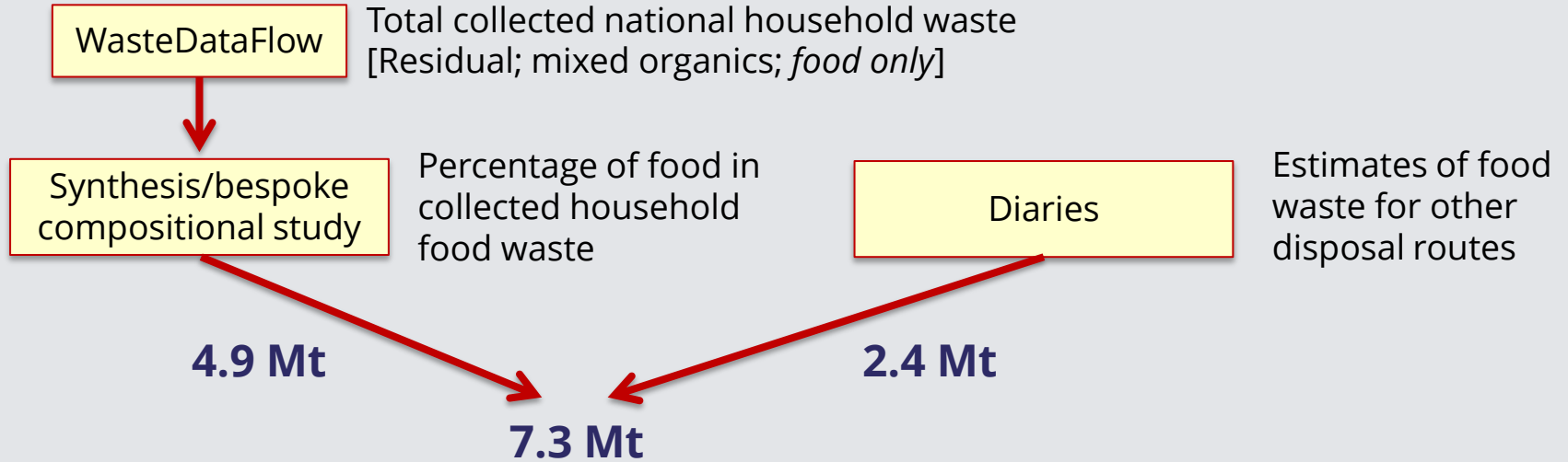
**27 Mt; >80% of household food waste is in  
the residual fraction**

# Measuring household food waste - summary

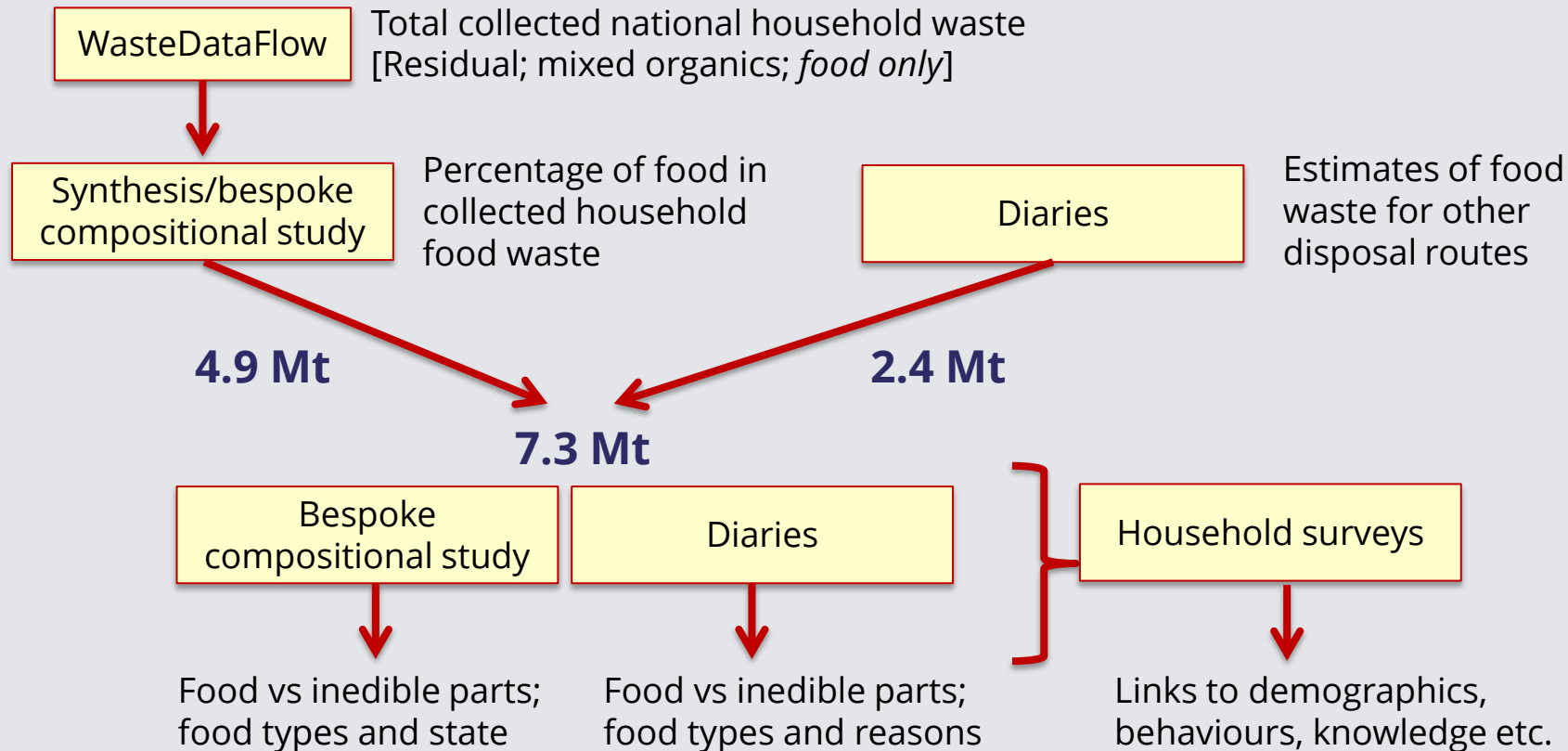




# Measuring household food waste - summary



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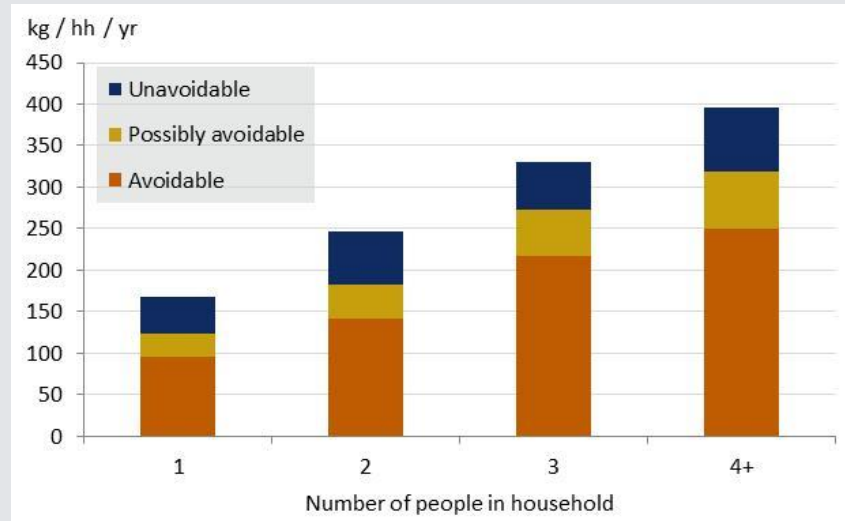
# Variations on a theme.....



- **Bespoke studies can be designed to suit what is needed:**
  - Level of granularity required
  - Number of households
- **This will influence costs, complexity and levels of uncertainty**
- **Availability and quality of data for any synthesis can be influenced:**
  - Funding can be provided to local authorities
  - A requirement to carry out local studies can be stipulated
  - Guidance can be provided on how local studies should be carried out

# Important considerations

- Design / analysis needs to include an awareness of factors that influence levels of household food waste, and therefore need to be controlled/adjusted for:
  - e.g. household size, collection type / frequency, seasonality etc.



# Below the UK level.....



**wrap**  
Central

Research note – FINAL

## Household Food Waste in Wales, 2015



This report provides estimates for total and avoidable household food waste in Wales, for 2009 and 2015, and discusses the change over this time period.

Project code: CSC107-GEN  
Research dates: September – October 2016    Date: November 2016

**wrap**  
Scotland

Material change for a better environment

Final report

## The food we waste in Scotland



A report of a study that p about the nature, amount households. The purpose and government bodies, policies, advice, tips and food we buy but don't eat

Project code: EV4077-001  
Research dates: 14.10.08 – 12.11.08

**Report**

## Household food and drink waste in Scotland 2014

Prepared by: Zero Waste Scotland Policy and Research  
Autumn 2016

**ZERO WASTE SCOTLAND**



**wrap**

Household food waste prevention case study: West London Waste Authority in partnership with Recycle for London

## The impact of Love Food Hate Waste



**LOVE FOOD hate waste**

Following a Love Food Hate Waste campaign in West London avoidable food waste decreased by 14% in just six months. The reduction in food waste overall could save the Boroughs of West London around £1.3 million pa in disposal costs (including gate fees and landfill tax). Between October 2012 and March 2013 Recycle for London (RfL) delivered a pan-London Love Food Hate Waste campaign supported by local Borough activity. The Greater London Authority (GLA) and WRAP worked in partnership to deliver the RfL programme, funded by the London Waste and Recycling Board (LWARB). One of the local campaigns was carried out in the six Boroughs of the West London Waste Authority (WLWA) area. This campaign provided an opportunity to further understand the impact of Love Food Hate Waste in reducing food waste and funding was available from Defra to monitor changes in behavioural and food waste levels. The campaign included radio, digital and print advertising along with supporting PR activity, events and community engagement such as cookery classes and engagement through a network of volunteers.

The full research report can be found at [www.wrap.org.uk](http://www.wrap.org.uk). Read on to find out more...

- **Target area:** West London Waste Authority 601,000HH
- **Dates:** October 2012 to March 2013
- **Project partners:** LWARB, RfL, WLWA, WRAP, and Greater London Volunteering
- **Impact:**
  - ✓ The amount of avoidable food waste (food which could once have been eaten) decreased by 14%. Total food waste decreased from 2.6kg per household per week pre-campaign to 2.2kg post-campaign
  - ✓ For every £1 invested West London Boroughs saved up to £8
  - ✓ Those households who had seen something about food waste and claimed to be doing something different reduced their avoidable food waste by 43% (a 35% reduction in total food waste)
  - ✓ Reduction in the amount of avoidable food waste is equivalent to 5,250 tonnes pa for households in West London.
  - ✓ West Londoners would have saved £14million by not wasting this good food and drink and 20,000 tonnes of greenhouse gases would have been prevented



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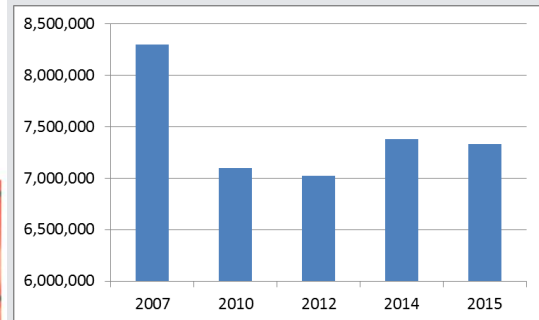
Date: December 2016

- **Quantifying food waste (robustly) is challenging!**
  - **Particularly the non-collected fractions**
- **The benefits of having comparable time-series data, and a robust evidence base are critical to an effective strategy to reduce food waste**
- **The financial benefits vastly outweigh the costs**
  - **Amounts of household food waste thrown away in 2015 were €3.1 billion less than in 2007**
- **Essential to have clarity on definitions, scope and research specifications**
  - **e.g. food plus inedible, no packaging**



- **Estimates for only a small percentage of food waste can be easily extracted from national statistics (<10%)**
- **Need to balance robustness and comparability over time, with cost and complexity – and agree what the ‘appropriate’ balance is**
- **Levels of uncertainty and likely changes in levels of household food waste mean that statistically significant differences may only be detected at say 3-5 year intervals**
- **Methods and understanding improves over time, therefore must re-calculate historical data to be comparable**
- **In-depth studies every 5 or so years, ‘light-touch’ approach for intervening periods**

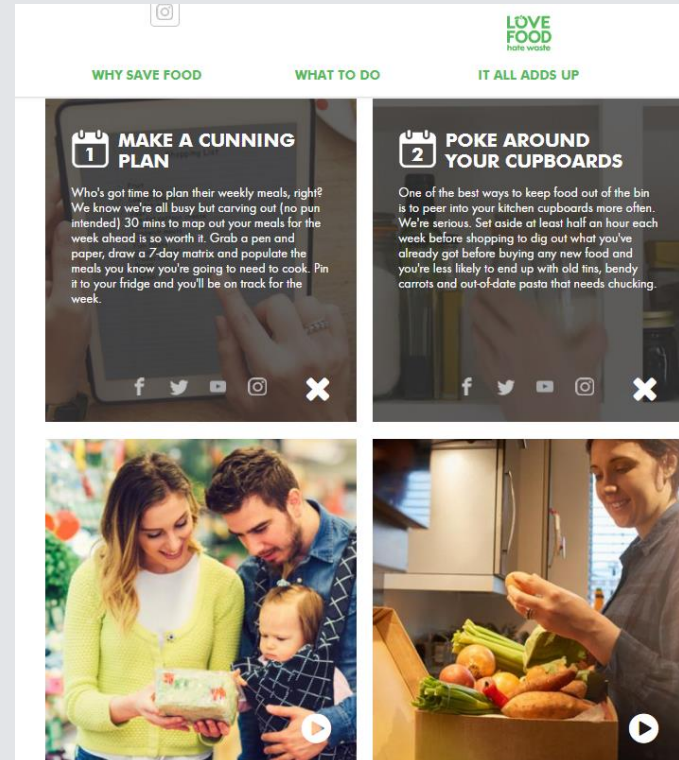
# Reporting



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# What next....



## Courtauld 2025

is an ambitious voluntary agreement that brings together a broad range of organisations involved in the food system to make food and drink production and consumption more sustainable.



Action will be delivered through collaboration, harnessing the power of partnerships, shared expertise and innovation

**Our collective ambition**  
is to cut the amount of resource needed to provide our food & drink by **one fifth in ten years**

## Targets

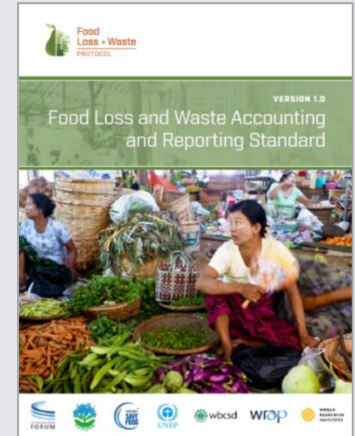
**20%**  
reduction in food and drink waste

**20%**  
reduction in GHG

# What next....



- **New strategy / refreshed campaign**
  - Drawing on the evidence base
- **Alignment with WRI Global Food Loss and Waste Standard**
- **Continue to look at how to develop more cost-effective monitoring and reporting**
  - New approaches
  - Indicators and proxy data
  - Learn from the experiences of others





# Next steps – Continuing to explore improvements to measurement

Food & drink purchases (green line) and food & drink waste (blue diamonds) (per person per week; adjusted to compare trends)

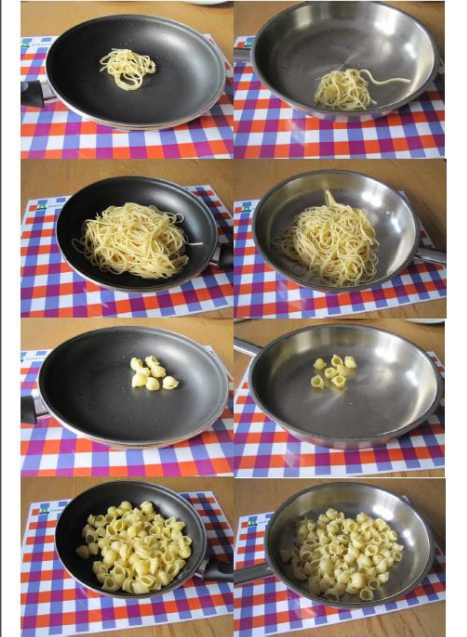


## Consumption life cycle contributions

### Assessment of practical methodologies for in-home food waste measurement

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Annex 8 - Example photographs in the photo study





# Questions and Discussion







# Extra slides

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