

Enhancing Participation in Kitchen Waste Collections

Defra Waste & Resources Evidence Programme
(WR0209)

Final Project Report

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Resource Recovery Forum



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1 Project background

Research Aims

As part of the second call of the Waste and Resources Evidence Programme, Defra funded a research project entitled *Enhancing Participation in Kitchen Waste Collections*. The overarching objective of this project was to build evidence on:

- How householders respond to the provision of food waste collections;
- How their response varies across socio-demographic groups and housing situations;
- How service design affects behaviour;
- Which participation barriers need to be addressed through communications;
- Lessons from existing practice in the UK and overseas.

The project ran from October 2006 to March 2008, with the majority of the primary data collection and analysis being completed between April 2007 and December 2007. The results should help local authorities, Defra and strategic agencies (e.g. WRAP, the RDAs) identify what action can be taken in order to maximise public engagement in food waste recycling. The research is timely because local authorities will increasingly need to reduce/divert food waste in order to meet their landfill targets for bio-degradable waste, and public engagement will be a key factor in whether they are successful.

This final project report:

- Describes the objectives and methodology, achievements and main findings of the research;
- Discusses the implications of the findings for maximising consumer engagement with food waste collections; and
- Outlines issues for further research.

The Project Report is supported by an extensive **Technical Report** which contains the detailed findings from research in six case study areas, including large-scale original consumer research (qualitative and quantitative). The technical report also draws on a review of key findings from previous studies and overseas practice which was undertaken at the start of the project.

Research team & other contributors

The research was designed and led by Brook Lyndhurst, working with partners the Resource Recovery Forum (RRF) and Waste Watch¹. Other contributions were made by consultant Jennie Rogers (data on coverage of collections), ICM (survey fieldwork) and Viewpoint Field (recruitment for focus groups).

In addition, the project team recruited a Sounding Board who are expert in either delivering food waste collections, waste sector research, and/or advising Defra on waste issues.² The Sounding Board acted as 'critical friend' and source of expert knowledge at key points in the project. The six case study authorities, too, made a valuable contribution to the project by taking part in interviews, supplying data and providing information in response to the team's many enquiries. We are very grateful to both the Sounding Board and the authorities for their considerable help and support.

¹ Resource Futures also contributed to the initial review by Waste Watch of operational issues.

² Sounding Board members are listed in the Technical Report.

A note on reading the report

Throughout this report we have used the term “food waste”, instead of the original term “kitchen waste”, since it became clear early on that this phraseology made more sense to practitioners and public alike. For the same reasons the report tends to refer to “food waste recycling” rather than “composting” (except where reference is made to home composting, of course).

The report also refers to two different kinds of food waste collection systems which are defined as follows. “Mixed food and garden waste (mixed FGW)” is used to refer to collections where food and garden waste are collected mixed together but in a separate ‘organics’ bin. “Food-only” refers to collections where food waste is collected on its own in a separate bin. In both cases, residents are allowed to put food waste into their residual or ‘ordinary’ bin but the separate bin is provided to encourage them to recycle food which the authority can then compost in a central treatment facility. ‘Food-only’ collection areas tend to charge for garden waste collections where this service is provided.

Readers should also bear in mind that the research adopted very much a consumer perspective – that is, what householders think about food waste collections and what they perceive as the barriers to participation. The project was not asked by Defra to generate primary data on material capture or composition, or on participation rates. Where possible, however, consumer claims were matched against secondary data on scheme performance, but such data were incomplete (see below).

At the same time as this study was underway, WRAP (funded by Defra) was supporting 21 authorities in trials of food waste collections. These trials identified how much material can be captured through food-only organics collections, and the key operational characteristics which underpin scheme performance. Unlike our work, the WRAP study did monitor participation and material capture but focused less on consumer perspectives. The two studies are therefore complementary in many ways and readers would be advised to consider the results from the WRAP study alongside our work.³

The first two sections of this report outline the main findings from the research, first the desk research, then the primary data gathered in the six case study areas. Section 5 then discusses what the implications of the evidence are for local authorities and Defra, and suggestions flowing from this discussion are made in Section 6.

2 Methodology & achievement of objectives

Methodology and outputs

The methodology combined desk research of national and international scope with primary case study and consumer research in six local authority areas – Bexley, Cambridge, Fenland, Hackney, Taunton Deane and Weymouth & Portland (selection criteria are described in Section 4).

The research involved a number of sequential phases which were described as the “key objectives” in the research contract with Defra. Their scope and the extent to which they were achieved are as follows:

³ http://www.wrap.org.uk/downloads/Evaluation_of_the_WRAP_FW_Collection_Trials_Update_June_2009.47f54e9b.7271.pdf

| Key Objectives |
|--|
| <p>1: Background 'Issues' paper</p> <ul style="list-style-type: none"> • Compile original data on coverage of food waste collections to describe the current 'state of play' in England & Wales • Review previous research to identify existing knowledge on operations, participation and capture, and highlight issues to be explored in the consumer research • Set up a Sounding Board & hold first meeting <p><i>All objectives completed. Findings reported to Defra and Sounding Board in an "Issues" working paper; findings drawn on in this project report and the Technical Report (Annex 1). A larger 'correspondents group' set up in addition to the Sounding Board to receive updates on research progress at key points.</i></p> |
| <p>2: Lessons from practice</p> <ul style="list-style-type: none"> • 30 local authority interviews to: <ul style="list-style-type: none"> ○ Identify key success factors & barriers ○ Assess availability of data on participation, capture & composition • Second Sounding Board meeting • Selection of 6 case study authorities where consumer research would be conducted <p><i>32 interviews completed; working note & scheme data on all 79 collection schemes circulated to Sounding Board to inform selection of case study authorities.</i></p> |
| <p>3: Area based case-study evidence</p> <p>Visits to 6 case study authorities to:</p> <ul style="list-style-type: none"> • Interview in greater depth about scheme design, operational issues and factors affecting public engagement with the scheme • Collate scheme performance data held by the authorities <p><i>All objectives completed (although data availability proved to be limited). Findings incorporated into Technical Report (Annex 1).</i></p> |
| <p>4: Qualitative household research</p> <ul style="list-style-type: none"> • 12 focus groups (1 user and 1 lapsed/non-user group in each of the 6 areas) to generate insight into motivations, barriers and language used by residents to describe food waste collections • A capture analysis with user-group participants (potentially up to 60 households) <p><i>12 focus groups completed & results analysed in internal working paper; capture analysis with 32 households. (see Technical Report).</i></p> |
| <p>5: Quantitative household research</p> <ul style="list-style-type: none"> • 4,200 face to face, in home interviews in the 6 study areas to generate statistically robust data to: <ul style="list-style-type: none"> ○ Test the extent to which the views from the focus groups can be generalised ○ Identify differences between household types and those with different services • National omnibus survey to benchmark survey findings from the 6 study areas • Second interim report • Third Sounding Board meeting <p><i>All outputs achieved, including 4,431 household interviews. The national omnibus data generated over-reporting of the incidence of food waste collections which undermined its usefulness for benchmarking. The national data is not used in this report (see Technical Report).</i></p> |

6: Analysis, synthesis and reporting

- Draw together findings from all components into a final report
- Develop recommendations on practical steps to take to maximise participation in food waste collection schemes

All objectives achieved. Findings are presented in this Project Report and detailed Technical Report.

7: Dissemination

- National one-day conference – for key stakeholders, including local authorities, policy and research communities
- Three regional half-day seminars, principally for local authorities
- Publication of reports on Defra web-site and alerting through e-networks
- Publication in at least one academic journal and practice journals

Three dissemination events held in March 2008 with additional support from Defra, WRAP, Yorkshire Forward and Somerset Waste Partnership. Internal briefing for Defra policy and research teams. Presentations at three national waste conferences and two regional conferences. Reports will be disseminated electronically once approved by Defra. In addition, Brook Lyndhurst helped develop the RRF's Food, Consumers & Resource Efficiency conference in November 2007 at which early findings from this project were presented, alongside other Defra and WRAP work.

All but a few of the project objectives were met in full and, in some instances, exceeded. The consumer research data in particular is unique in the UK, and provides large-scale robust evidence on consumer response to food waste collections which was not previously available. However, there are a small number of areas where the data are either not as extensive or as robust as was originally hoped for: secondary scheme performance data, focus group capture analysis, and the national omnibus survey.

The limitations of the latter two, which are explained in detail in the Technical Report, mean that they have not been used extensively in the analysis, except where they add extra information to points supported by other robust data. The main area of consequence to the overall findings is the availability and quality of secondary performance data, which is a sector-wide problem (and one which is addressed in Defra's Waste Data Strategy). It is worth outlining here the performance data which were and were not available. Data made available to the project included:

- Total collected tonnes of organic waste for each case study authority (from the authority and checked against Waste Data Flow (WDF)).
- Very partial participation monitoring data, generally from small-scale monitoring over a short period (and sometimes with health warnings from the authority).
- A few ad hoc compositional studies which allowed capture rates to be estimated in some cases. However the comparisons we have made between areas need to be treated with some caution because of differences in the methodologies and seasonality of the studies used to generate the data; also how long the scheme had been running when the study was conducted.

Robust monitoring data were not available on:

- Variations in participation or capture between areas with different socio-demographic characteristics or housing types;
- In mixed FGW areas (where food waste is collected mixed with garden waste), participation or capture for the food waste element separate from the garden waste component. In most cases reviewed (the 6 case studies and the other 26 authorities interviewed) there is no firm evidence on how effectively mixed FGW collections are capturing food waste.

Finally, it proved difficult to obtain accurate and consistent data on the number of households covered by the collection, both for the scheme as a whole and at the level of individual properties.⁴ Reconciling household data (especially with survey samples drawn from Census data) was a time consuming process but we are confident of the accuracy of the data used in the report.

3 Findings from the desk research & lessons from practice (objectives 1 & 2)

3.1 How much food waste is there?

Domestic food waste is one of the most significant sources of bio-degradable waste that local authorities have to deal with, generating more tonnes than packaging⁵, and accounting for 19% of municipal waste arisings. In total, UK households create 6.7 million tonnes of food waste each year (5.5 million tonnes in England), of which 4.1 million tonnes could have been eaten⁶. Household food waste also has a substantial greenhouse gas (GHG) impact, accounting directly for around 5% of UK annual CO₂ emissions as well as significant methane emissions (a more potent GHG).

On average, each household produces 276 kg of food waste a year, or 5.3 kg per week, of which 3.2 kg could have been eaten (see footnote 6). The amount and type of food waste varies between different types of household, a factor which local authorities need to build into their planning of food waste collection services (e.g. the best size of food bin for residents; capacity required for collection vehicles; which food types to inform residents about). The WRAP study provides very detailed evidence on who produces what, and how much. Their study shows that the number of people in a household is a key determinant of the amount of food waste produced, such that differences noted between socio-demographic groups are often attributable to variations in household size. Differences between groups calculated on a per capita basis tend to be smaller. Variations that provide useful context for the present report are:

- Households that produce less food waste than average include (kg/hh/wk for total food waste):
 - Older people aged over 65 (3.5 kg)
 - Single person households (3.2 kg)
 - Households in social classes AB (professional) (5.0 kg)
- Households that produce more than the average include:
 - Large households (7.6 kg in households of 5 people, 9.6 kg in households of 6)
 - Households with children (7.3 kg)
 - Younger households (7.4 kg where the household head is aged 16-24; 6.9 kg for 25-34s)
 - Households in social classes DE (6.1 and 6.3 kg)
 - Asian households (9.1 kg) (particularly the 'non-avoidable' portion which includes peelings, at 4 kg)

⁴ This issue was also reported by other Sounding Board members undertaking evaluation work.

⁵ WRAP (2007) *Understanding Food Waste, Research Summary*.

⁶ WRAP (2008) *The Food We Waste*. WRAP's research provides extensive detail on which food types are disposed of, at which stage in their consumption lifecycle (e.g. prepared or not) and variations by household types. Our research was conducted before WRAP completed their study but our findings are consistent with the WRAP research. WRAP updated these figures in November 2009 with revisions to the amount estimated to be disposed of by the sewer: 8.3 million tonnes of food and drink is wasted in the UK of which 5.3 million tonnes is avoidable; 5.8 million tonnes is collected by local authorities in refuse and separate food waste collections. We have used the figures for food excluding drink because we are mainly concerned with food that is available for collection.

In WRAP's research Asian households were on average larger so could be expected to have more food waste in total; on a per capita basis there was little difference between households of different ethnicity. Earlier research (cited by WRAP⁷) had similarly found that Asian households tend to produce more food waste, while a number of local authorities involved in our research flagged this factor as something that local authorities need to consider when designing food recycling services. Based on the WRAP data, ethnicity is clearly only one of the factors that local authorities need to take into account in planning food recycling services.

WRAP's work did not look at the difference between houses and flats, but earlier research demonstrated a significant difference between houses and flats (260 kg/hh/yr and 195 kg/hh/yr respectively)⁸. The authors also noted a wide range around the average, from 1.3kg per week in the lowest household to 6.2kg in the highest.

3.2 Styles of collection

In 2007, Eunomia estimated that around 2% (110,000 tonnes) of the total was collected for centralised composting while 204,000 tonnes was composted at home.⁹ Styles of collection vary widely between authorities and involve a large number of permutations of service characteristics, including:

- Food waste collection frequency
- Residual waste collection frequency
- Whether food is collected separately or mixed with garden waste (sometimes also with card or paper)
- Type and size of food waste bin (or, more rarely, sack)
- Range of food items collected (cooked/uncooked; with/without meat)
- Whether kitchen caddies and/or liners are provided; and whether these are free of charge or for purchase
- Arrangements for residual waste (e.g. containment type - notably bin or sack, overall bin capacities, and side-waste restrictions)

To understand the individual resident's perspective, we need to consider not only the style of the food waste collection on its own but also how the various waste collections in any one area fit together to create an overall service package – for instance, the relationship of food collections to dry recycling provision, or constraints on the total bin capacity for all streams. The way in which the overall 'customer package' may affect public engagement in food recycling is considered further in section 3.5.

The degree of variation in how existing collections operate makes it difficult to compare like-with-like in terms of performance. No one model has yet emerged as the definitive solution, although recent research has argued strongly for the effectiveness of weekly food-only collections on both cost and environmental grounds¹⁰.

Authors have also pointed out the 'wasted' costs that arise in mixed FGW collections because, once mixed with food, the garden waste element has to be treated in-vessel, at greater cost than if it were collected separately and windrow composted¹¹. Experts contributing to the present research concurred. WRAP has since evaluated trials of food-only collections in 21 local authority areas, providing more detailed evidence on

7 Luckin (2003) *Ethnicity, Waste Generation and Related Behaviour*.

8 AEA Technology (2004) *Variations in the Composition of Household Collected Waste*.

9 Eunomia (2007) *Dealing with Food Waste in the UK*.

¹⁰ Eunomia (2007, updated 2008) *Managing Biowaste from Households in the UK: Applying Life Cycle Thinking in the Framework of Cost Benefit Analysis*.

http://www.wrap.org.uk/downloads/Update_to_Biowaste_CBA_Report_5fe92e08.6164.pdf

¹¹ Eunomia *Dealing with Food Waste in the UK*. The report provides an account of treatment options and relative costs.

costs and operational aspects, as well as tonnage performance¹². WRAP is currently compiling performance data for mixed FGW systems so that local authorities will have further information on which to compare the different options.

Collection is only one part of the equation that local authorities need to consider when setting up a food waste recycling scheme. The way in which food is collected has further implications for collection logistics (e.g. number and types of vehicle), material capture rates, service costs, and which treatment methods are suitable - in-vessel composting (IVC) or anaerobic digestion (AD) being the main choices, with some authorities opting for Mechanical Biological Treatment (MBT). To support the development of anaerobic digestion, WRAP and the Environment Agency have recently developed a quality protocol which defines the minimum standards required for collecting, transporting, storing, recycling and reusing source-segregated biodegradable waste through AD processes¹³.

Expert contributors to the project (and others) urged authorities to take this kind of whole system approach when thinking of introducing a food waste collection scheme, rather than simply focusing on collection and participation alone. Recognising that this is not always straightforward where responsibilities for collection and disposal are split, several of the authorities interviewed said that partnership working had been crucial in establishing successful schemes. Interviewees also stressed the importance of pre-scheme communication and engagement, not only with the public but also with other stakeholders including the media - as well as having strong cross-party political support from councillors¹⁴.

3.3 Coverage of food waste collections in the UK

In practice, there are three main styles of food waste collection in the UK¹⁵:

- Weekly food waste, weekly residual
- Alternate weekly collection between residual and food waste
- Weekly food waste, alternate weekly residual collection

Even if it is not how they currently operate, many of the authorities we spoke to favoured alternate weekly collection of residual waste (AWC) with either fortnightly or weekly food waste collection because this was felt to offer the most incentive to households to use the food waste service. Their view is backed up by performance data from the WRAP food collection trials which showed that fortnightly collection of residual waste was a positive, and statistically significant, factor influencing food waste yields. In the authorities we interviewed, the incentive is typically reinforced by means of a no side-waste policy for residual bin collections (though residual bin size varies widely). A small number of authorities run weekly residual and fortnightly food waste collection but this system may discourage households from recycling food on alternate weeks because residual collection is always available.

Much of the current provision in the UK has evolved out of pre-existing garden waste collections to which food has been added at a later date. This means that many authorities are operating systems that they may not have chosen if they had designed a food waste collection from scratch, and for which the style of collection is dictated by other service factors.

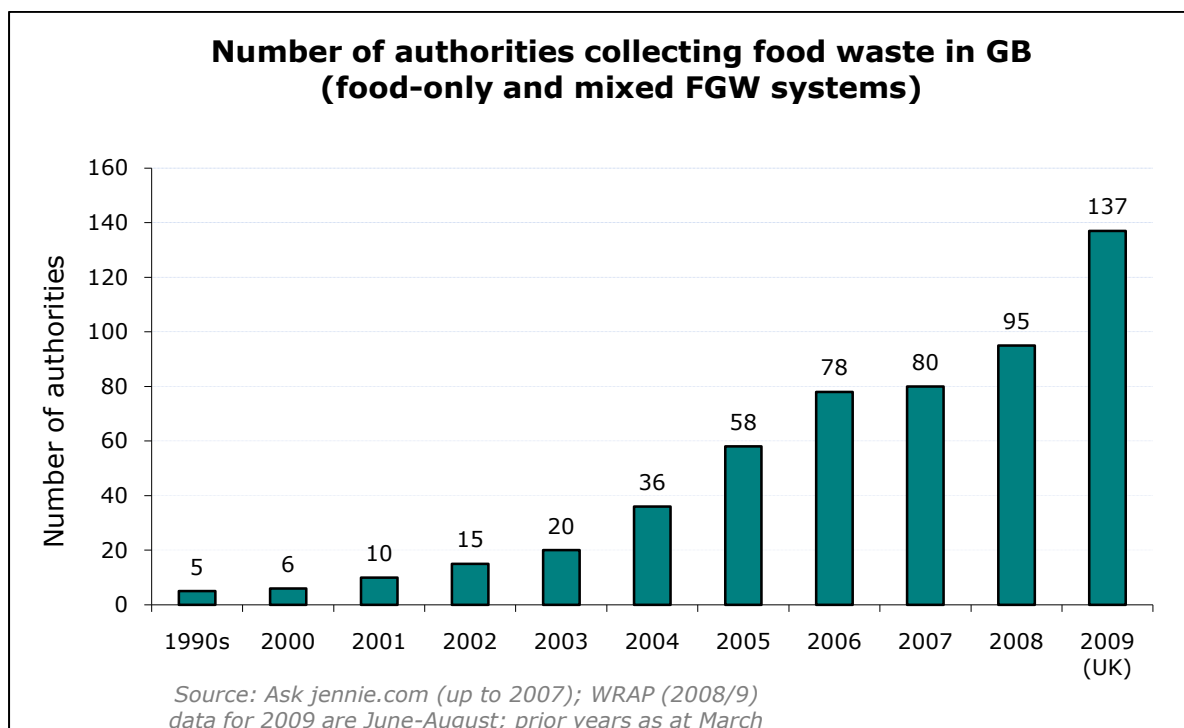
¹² WRAP (2008, updated 2009) *Evaluation of the WRAP separate food waste collection trials*.

¹³ WRAP and the Environment Agency (2009) *Quality Protocol, Anaerobic Digestate*.

¹⁴ See also WRAP's communications case study, developed from the evidence from its food waste trials.

http://www.wrap.org.uk/downloads/Case_study_D_-_communications_FINAL_29_09_08.dfb41129.6405.pdf

¹⁵ Evidence and data on collection styles were gathered by the team in the first phase of our research up to March 2007; data for later years has been provided by WRAP (private correspondence).



In March 2007, 10% of households in GB were provided with food waste collections (11% in England), in 79 local authorities. More recent estimates from WRAP show that coverage has grown rapidly in the last two years, with 137 authorities across the UK (108 in England) providing food waste collections¹⁶.

- Where authorities collect food waste mixed with garden waste, it is often on an AWC basis and usually in wheeled bins (240L or 180L);
- Authorities that collect food waste separately, usually do so in much smaller bins (20L, 25L or 35L) and often weekly.
- Not all include meat and bones; some target cardboard, either to enhance the customer offer or to add carbon to the collection mix (to enhance its usability for compost).

Food-only collections are being introduced at a faster rate than mixed FGW systems. In 2007, three-quarters of collections were mixed FGW; by 2009 the split between food-only and mixed FGW was nearly even with 47% of authorities offering food-only collections¹⁷.

3.4 Participation & capture – the evidence

The research found a small amount of evidence on participation, overall tonnages achieved and kg/hh recovered. However, little data exists on food capture rates, especially where food is collected with garden waste (i.e. most schemes). Moreover, it is difficult to compare between studies because of factors such as differing methodologies, different scheme characteristics, seasonality of samples, and lack of background socio-economic data. The following is a summary of the main headlines from the review.

¹⁶ Private correspondence, WRAP, September 2009.

¹⁷ WRAP, *ibid*.

Participation

Participation rates can vary from as little as 10% to 90% or more. More usually, participation in UK studies varies between 30% and 50%; the WRAP trials recorded 21% to 76% participation¹⁸. A few authorities have reported a fall-off in participation after a 'honeymoon' period but more evidence is required to substantiate whether this happens more widely and why (e.g. true drop-out or increase in home composting). The WRAP trials showed some decline in participation over the course of the trials but they commented that this was no more than would generally be expected of a new service.

UK and overseas experience suggests that **participation** may be higher for mixed FGW schemes than food-only collections, but the **amount of food waste** recovered may be greater in collections where food is collected separately. This is because mixed organics collections may be used by residents mainly for garden waste.

Some authorities suggested that residents may perceive the scheme more favourably if garden waste is collected as well, since this is a service residents generally want and it compensates them for the extra effort of separating food waste. Others argued that since people are used to using the collection anyway they may find it easy to add in food as well, if the option is made available to them. One study¹⁹ also speculated that mixed FGW collections protect participation in the summer because the mix may be less smelly than in food-only bins (though odour was not measured).

The risk with mixed FGW collections is that they draw into the system garden waste that would otherwise be composted at home or taken to a HWRC²⁰. A trial in Bath & North East Somerset in 2003, for instance, found that food waste participation was similar across trial areas regardless of whether garden waste was charged for, but participation for garden waste was much higher in the areas where this part of the service was provided free of charge²¹.

Prior to the WRAP trials, published evidence on whether participation varies by socio-demographic or housing characteristics was inconclusive, and opinions differed amongst the 32 authorities we interviewed. One of the most commonly reported differences is between 'settled' and 'transient' households (e.g. students, short-term rented accommodation, inner urban areas) with markedly lower participation in transient areas. Some authorities record or suggest higher participation in more affluent areas (but not all interviewees supported this view) and a few highlighted greater participation from those already committed to dry recycling. For food-only collections, the WRAP trials demonstrated a strong correlation between levels of deprivation and participation, with a tendency to higher participation in less deprived areas. The average participation in multi-occupancy properties was low, at 25% on average.

Recovery and capture rates

The amount of food captured from each household depends on which food items are collected, at what frequency, and how often residual waste is collected. The very small amount of evidence available (from mixed FGW and food-only schemes) suggests that

¹⁸ WRAP (2008, updated 2009) *Evaluation of the WRAP separate food waste collection trials*.

¹⁹ ORA (2007) *Pilot Food Waste Collection Trials in Milton Keynes*.

²⁰ Household Waste Recycling Centre.

²¹ See also, WRAP (2009) *Food Waste Collection Guidance*, Figure 6, which shows capture for different systems. WRAP also provides analysis of the relative costs and benefits of food-only and mixed FGW systems: Eunomia (2008, for WRAP) *Food Waste Collection: Update to WRAP Biowaste Cost Benefit Study*.

capture rates of 30-40% are achievable²². Much more data is needed to confirm these figures.

Many interviewees suggested that AWC of residual waste makes a critical difference to the amount of food captured, especially where food is collected weekly. Their observations are borne out by data published by WRAP which suggest the following food waste capture²³:

- Weekly food, weekly residual 30 to 40 kg/hh/yr
- AWC of food and residual up to 50kg/hh/yr
- Weekly food, AWC residual at least 90kg/hh/yr

Not surprisingly, non-meat collections tend to capture around half what meat-inclusive schemes achieve. What limited evidence there is suggests that providing caddies and caddy liners can increase capture, because they reduce the 'hassle factor' for users by containing liquid better and keeping bins cleaner, but again more evidence is needed.

Contamination

Both UK and overseas studies show very low rates of contamination, certainly less than 5% and typically between 1% and 2.5%.

The main contaminants are plastic bags; and stones and rubble in mixed FGW collections. Bio-degradable liners may become a more prominent contamination issue in future where bags are not provided directly because of confusion amongst consumers - in particular, about different kinds of bio-degradable bags, and/or supermarket 'degradable' plastics bags.

Again, there is no conclusive evidence on where contamination is greatest though there is some consensus that it can be worse in areas with transient households and where bins are shared (e.g. in blocks of flats). Some local authority interviewees reported specific contamination issues in some areas in relation to plastic bags used to contain oily foods. Where contamination was found, it had often been overcome through repeat contact with residents at the start of the scheme and communications targeted to the needs of different sections of the community, including translation of leaflets and, importantly, community outreach work (e.g. working with Sikh Temples (Bexley) or doorstepping by staff with a similar cultural background (Preston)).

3.5 Issues that influence participation & capture

From a resident's perspective, there are many aspects that could influence their participation. Those identified most frequently in the literature and in interviews with local authorities are:

- **Fear that dealing with and storing food waste separately will be smelly, dirty and attract vermin.** Authorities and experts alike suggested that perception is a much stronger barrier than actual experience. Once services are introduced user surveys generally report high levels of satisfaction and previous problems with vermin can decline where sack-based residual collections are replaced by rigid bins.
- **Perception of added 'hassle'** – e.g. separating 'yucky' items in the kitchen; having an extra bin; needing to wash bins more often/at all.

²² Where capture rate is defined as the amount of food waste captured in the food waste bin as a percentage of total food waste produced by the household (usually excluding an allowance for home composted food because few studies estimate this).

²³ The WRAP food waste trials provide more extensive evidence for food-only collections.

- **Provision of caddies and liners** to reduce 'hassle' and 'yuck'. However, some authorities reported a degree of dependence on liners where these were offered at the start of the service then withdrawn or not replaced automatically; other authorities suggested dependence could be overcome through educating residents to use newspaper or other wrapping. Other authorities have always offered liners for purchase, but ease of purchase varies between authorities.
- Related to feelings around dirty bins and hygiene, a greater **need to return bins to the same household**, an issue that has been reported for dry recycling but could be even more marked for food.
- **Householder apathy and disinterest** – a number of authorities noted this as a key reason for non-participation.
- **Home composting** – either diversion of previously home-composted garden waste into the collection (as noted above); or, a stronger preference to compost food at home (and, by implication, to not recycle foods unsuitable for home composting, e.g. meat).
- **Lack of consumer knowledge** about end uses for recycled household food waste.
- **Strength of the call to action** – communicating reasons why people should want to participate, for example, why food waste is a problem, its relationship to climate change, the benefit of end uses, reducing vermin (e.g. on high rise estates).
- **On-going customer support**, especially in terms of specific instructions about what foods to recycle and collection dates. Some authorities use promotions around particular seasonal events and foods as reminders.

4 Findings from the case study areas (objectives 3-5)

Case study areas were selected jointly by the project team, the Defra research managing agent (RMA) and the Sounding Board (SB), drawing on the scheme data collated in the first phase.

Selection was driven by a desire to include both mixed FGW and food-only collections, and schemes with different collection frequencies (for residual as well as food waste). Other criteria included:

- Maturity of the scheme;
- Percentage of households covered;
- Availability of performance data;
- Population density – aiming for a mix of urban and rural;
- Sufficient coverage of socio-economic groups that may not be present in all local authority areas but are sizeable proportions of the UK population: specifically residents of flats; and Black, Asian and minority ethnic (BAME) households.

Authorities which only allow uncooked fruit and vegetables in the collection were excluded, on the grounds that this model is unlikely to be favoured in future because it offers the least diversion potential (since cooked food would still go to landfill).

The six authorities selected were Bexley, Cambridge, Fenland, Hackney, Taunton Deane and Weymouth & Portland²⁴. Bexley is a unitary authority, Weymouth is a collection authority, while Cambridge, Fenland, Taunton and Hackney are all part of wider waste partnerships.

²⁴ For the sake of brevity, Taunton Deane is referred to as Taunton, and Weymouth & Portland as "Weymouth" for the remainder of the report

Information about the food collection service in each authority was collated through desk research, visits to the authorities and follow-up contact with them. This was followed by two qualitative focus groups with residents in each area and quantitative interviews with 4,431 residents across the six authorities. The sample for the quantitative survey was drawn so as to be representative of the local population in each area, then residences were excluded where food waste collections were not provided by the authority²⁵.

Results are grouped as follows:

- Context for the findings on behaviour and attitudes (sections 4.1 and 4.2)
- Food waste recycling behaviour (section 4.3)
- Drivers of public engagement and participation in food waste collections (section 4.4)

4.1 Background to the case study areas

There are substantial differences between the six areas, all of which have the potential to influence scheme performance and responses in the consumer surveys. They are summarised below to provide context to the detailed case study findings which follow. The profile of the survey sample, with a national comparison profile, is shown in the Annex to this report.

Socio-demographics

The areas vary from highly urban to very rural, predominantly White British to ethnically diverse, and across the whole income and social class spectrum. In summary²⁶:

- **Bexley** – is a suburban London borough with a majority of owner occupiers and a small BAME population (8%). It has affluent pockets in the south of the borough and less well off households in the north.
- **Cambridge** – has a slightly lower population density than Bexley, has a mixed housing stock with many terraced properties in the centre, 11% BAME households, and is significantly more affluent than average (63% are social class ABC1) – though it also has a large student population.
- **Fenland** – is the most rural of all the areas with slightly above average owner occupation; but it is less affluent than average (58% C2DEs) and currently has high levels of in-migration from Eastern Europe.
- **Hackney** – has an extremely high urban density (nearly three times that of Bexley), a high percentage of low income, younger and BAME households (59% are White). The authority reports high residential mobility at 20% per annum.
- **Taunton** – is the second most rural but with an urban concentration at the centre. The population is affluent and older, and almost entirely White British (98%).
- **Weymouth** – is a mixed urban/rural area, with an older than average population but one which is markedly less affluent than in Taunton; 97% of the population is White British. The topology of the Portland area – steep hills, narrow streets, and terraced housing - poses significant difficulties for waste collection.

²⁵ NB The nature of the sampling means that two-thirds of the black and minority ethnic respondents (BAME) in the total sample were in Hackney, so that the results for BAME respondents may not be generalisable to areas with different kinds of collections. See the Technical Report for further survey data for socio-demographic groups. A table showing key demographics for the samples in case study areas is provided at the end of this report.

²⁶ Further detail is provided in the Technical Report.

Collection style

| | Materials | Residual collection frequency | Food collection frequency | Food bin | Caddy |
|------------------|---------------|-------------------------------|---------------------------|---------------|--------------|
| Bexley | Food + garden | Weekly | Weekly | 140 L | Yes |
| Cambridge | Food + garden | Fortnightly | Fortnightly | 240 L or 75 L | Yes |
| Fenland | Food + garden | Fortnightly | Fortnightly | 240 L | For purchase |
| Hackney | Food | Weekly | Weekly | 20 L | Yes |
| Taunton | Food | Fortnightly | Weekly | 25 L | Yes |
| Weymouth | Food | Fortnightly | Weekly | 120 L or 25 L | No |

The table above summarises the nature of collections in the study areas²⁷. Collections are provided to every household in Fenland and Taunton, to 91% in Bexley and Cambridge, 79% in Weymouth and 54% in Hackney²⁸. The main exclusions are flats, although some low-rise flats are included in Hackney, as are some multiple occupation houses in Cambridge and Bexley.

Some of the 'food-only' collections allow small amounts of other materials, including corrugated card in Weymouth. Fenland and Cambridge also collect card with organics; all areas except Hackney allow newspaper for wrapping food or lining bins.

Potentially also of influence, each area offers a different overall containment capacity (food + dry recyclables + residual). Bexley and Hackney allow unrestricted residual waste so have no limits (though recycling is compulsory in Hackney); the weekly equivalent in Fenland is 360L, 295L in Cambridge, 250L in Weymouth and 170L in Taunton. In essence, this means that Fenland residents have the bin space to generate twice as much waste as Taunton residents, while those in Bexley and Hackney have no constraint.

Communication approaches

All case study authorities (and most of the others interviewed) stressed the importance of intensive public engagement before and immediately after the scheme is introduced, especially where it is one element of a new AWC service. The basics in all case study authorities included roadshows, letters, and leaflets. All produced either booklets or bin stickers to illustrate (usually photographically) what can and can't be placed in food waste bins. Taunton benefited from a supportive councillor writing a weekly column in a local newspaper while others had used advertorial in local newspapers or secured radio coverage. Hackney advertised on town centre banners, bus backs and cyclists' jackets.

²⁷ Correct at the time of the research in 2007. Authorities may have made changes to their food waste collections since.

²⁸ Reflecting its housing diversity, Hackney operates several different schemes. The consumer survey covers only the ECT-run scheme, the largest, covering 51,000 households. The other schemes were excluded for technical sampling reasons, as explained in the Technical Report.

Other notable aspects of communications were:

- **Branding** – e.g. Bexley’s “Scrape the Plate”, use of standard WRAP iconography in Cambridge, “SORT IT!” in Taunton (Somerset Waste Partnership).
- **Incentives** – e.g. a voucher for free caddy liners (Bexley); prize competitions (Fenland).
- **Promoting the value of end uses** – as a means of encouraging support (e.g. use of food-derived compost in local parks in Hackney).
- **Maggot prevention/management** leaflets or articles (Cambridge) or advice on bin cleaning.
- **Joint promotion of home composting** – e.g. highlighting that the food collection accepts materials that cannot be composted at home.
- **Community outreach** – doorsteppers recruited from the target community and ‘Green Champions’ (both Hackney).
- **Exemplifying food waste collection** – e.g. providing collections at a Sikh temple; ‘brown bin’ monitors in schools to ensure plate scrapings are collected (both Bexley)
- **Doorstepping** focused on low participation areas – e.g. Weymouth and annually in Bexley.

4.2 General attitudes to recycling and organic waste

The report turns now to the findings of the consumer research with local residents, backed up where available with information on actual scheme performance. To recap, the quantitative survey covered 4,431 households in total, equating to 700 or more interviews in each study area. This followed on from 12 focus groups (2 in each area) which examined attitudes and behaviours in more depth.

Recycling for dry recyclables appears to be a more or less normalised behaviour with only 8% of the total sample saying they recycle little or nothing and focus group respondents being largely supportive of the idea.

As is usually found in recycling surveys, older home owners are the highest recyclers while young people are much less likely to recycle. More than 70% in Fenland, Bexley, Cambridge, and Taunton say they recycle as much as they can, rising to 85% in Weymouth (the area with the oldest population). Hackney is different, where only 58% claim the same.

Claimed home composting varies from just under a quarter of households in Bexley, Cambridge, Fenland and Hackney to 36% in Taunton and 41% in Weymouth (no figures on actual rates are available).

All but 5% of households in the mixed FGW collection areas put their garden waste in the collection, with 72% using it as the primary channel for such waste (4% don’t have garden waste). Not all households in these areas use the collection for food waste, however – around 70-75% are doing so depending on the area.

4.3 Food waste recycling - behaviour

4.3.1. Participation

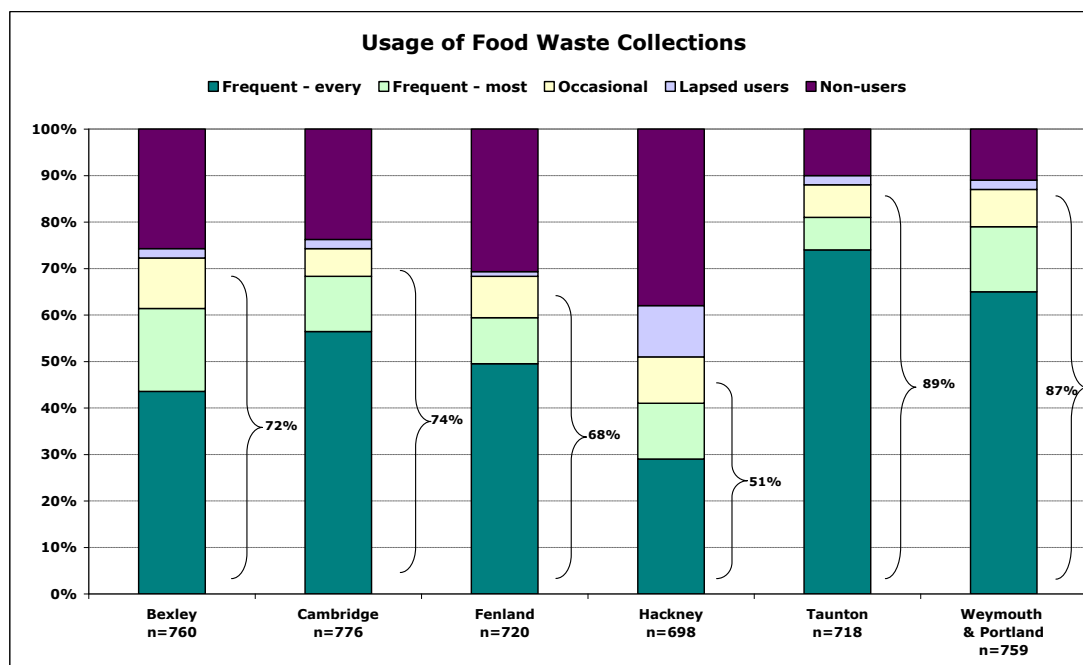
Claimed participation in food waste collections is high: nearly three-quarters (74%) of respondents across the six areas say they put food into their organics collection (i.e. food-only or mixed FGW food and garden waste collection).

Other main channels for disposing of food waste are home composting (16%) and the 'ordinary refuse bin' (33%). Notably, households in Bexley, Cambridge, Fenland and Hackney are much more likely to put food waste in their 'ordinary bin' (40-50%) than are residents of Taunton (5%) and Weymouth (11%). Pets and sinks or toilets also featured prominently in the focus group discussions as popular disposal options, though these were mentioned less in the survey.

Households were divided into groups according to their claimed frequency of use:

- **Frequent users (65%)** – comprising 'every time' users (53%) and those saying they use the collection most times (12%)
- **Occasional users (8%)** – those using it fairly often or occasionally
- **Non-users (26%)** – those never using the collection (23%) and lapsed users (3%)

Participation varies significantly across the six areas, being highest in (food-only) Taunton and Weymouth and lowest in Hackney (also food-only). Participation generally declines with rising urban density, though participation in Fenland is lower than might have been expected given its rural nature.



It is well documented that participation is always over-claimed in waste surveys and we did not expect this case to be any different - especially as we suspect that feelings around the morality of wasting food generate a stronger guilt factor²⁹.

²⁹ See the Brook Lyndhurst research for WRAP reported at http://www.wrap.org.uk/downloads/FoodWasteResearchSummaryFINALADP29_3_07.d587097d.3659.pdf

Comparison of the survey results with monitoring data (where it exists) shows that over-claiming in our survey is of a similar magnitude to that reported in previous food recycling studies (i.e. 20-30% greater than monitored participation). It also suggests that the figure for 'every time' users is the nearest indicator of actual participation, as follows:³⁰

| | Claimed participation in authority's own survey | Observed participation | 'Every time' users in this survey |
|----------------|---|------------------------|-----------------------------------|
| Bexley | 90% North 76% South | 40% North 50% South | 44% |
| Hackney | na | 20% | 29% |
| Taunton | 80% | 60-70% | 74% |

4.3.2. Capture

Data on collected tonnages and food waste capture were provided by the study authorities and from Waste Data Flow. It shows that mixed FGW systems are collecting far more organic material in total than the food-only authorities:

- ~230 to 280 kg/hh/yr in mixed FGW collections
- ~80 to 120 kg/hh/yr in food-only collections

The weekly food/fortnightly residual collections (Taunton and Weymouth) compare favourably with the 90+kg benchmark reported earlier for this kind of system.

Reflecting growing seasons, there is a very strong seasonal pattern to collected tonnages in all three mixed FGW areas, with two to four times more material being collected at the peak of the growing season as in the winter trough. Food-only collections display little seasonal variation, by contrast.

It is difficult to estimate with confidence how much of the organic waste in mixed FGW collections is made-up of food waste because we are reliant on a handful of ad hoc compositional studies, which are vulnerable to seasonal and methodological effects. Subject to this caveat, the proportion of food waste in the organics collections in Bexley, Cambridge, and Fenland seems to be around 8%-13%, although one study in Cambridge (February to April 2007) put the food share at 30%.

Within the limitations of the data it does seem clear, however, that more food waste is being captured per household in the food-only study areas than in the mixed FGW collections, confirming the findings of earlier studies. The amounts collected are:³¹

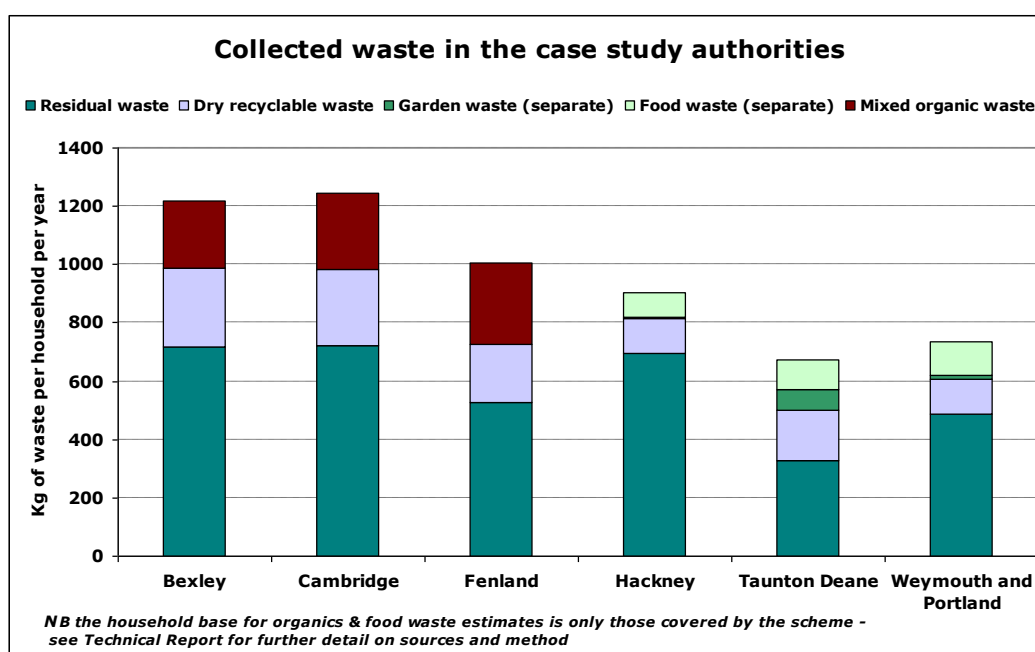
- Around 0.5 to 1 kg/hh/wk in mixed FGW collections
- Between 1.6 and 2.2 kg/hh/wk in food-only collections

³⁰ This does not necessarily mean that 'every time' users are the only ones participating, simply that it is the best indicator of the proportion who are committed to food recycling. A proportion of people in each group is probably over-reporting what they do so that the combined total number of users is less in practice than is claimed. The over-claiming observed here concurs with previous research, including studies reviewed in the early part of this research, as well as WRAP's food waste trials.

³¹ NB the data for food-only collections are more reliable than the estimates for mixed FGW areas; the former are based on collected tonnages whereas the latter are estimated from ad hoc compositional studies.

Where food waste capture rates were reported they were also lower in mixed FGW collections (17% in Fenland and 35% in Bexley) than in food-only (53% in Taunton). The consumer survey lends support to these figures, with nearly 4 in 10 respondents in mixed FGW areas using the collection either mainly for garden waste, or using it never or infrequently for either food or garden waste.

Another startling feature is the vast difference between the areas in terms of the total amount of waste they generate (collected bin waste only). Notably the two areas which have the least weekly-equivalent total bin capacity³² and the smallest residual bins generate much less waste for collection per household. These two areas also have the highest rates of home composting and Weymouth has a markedly older population.



4.3.3. Variations across socio-demographic groups and housing types

The authorities' own data cannot support generalisations about variations by housing type or social group (samples are either too small or too focused). However, a participation study in Bexley³³ did show higher participation in the more affluent south of the borough, and highlighted the difficulties of engaging transient populations. Taunton's analysis showed no consistent variations by social status but suggested that housing type and storage space were more influential.

Our large-scale survey revealed a pattern of claimed participation which is commonly reported elsewhere for dry recycling – that is, higher participation amongst older households, higher social grades and those living in larger houses, and the lowest rates for less 'settled' households, notably students and private renters. Taking the average benchmark of 53% of the sample being 'every time' users, the highest and lowest food waste recyclers are³⁴:

³² A 'weekly equivalent' capacity was calculated to allow for comparison between areas with different collection frequencies for different materials. It was derived by adding up total bin space provided over a fortnight for residual, recycling and organics regardless of collection frequency, then dividing by two.

³³ Hyder (2007). See Case Studies report for further detail on participation data and its sources.

³⁴ All differences shown in the table between highest and lowest are statistically significant at the 95% level.

| Highest participation (% who are every time users) | Lowest participation (% who are every time users) |
|---|---|
| <ul style="list-style-type: none"> • Over 35 (65%) • Social class AB (57%) • Working part-time (59%) or retired (57%) • Semi or detached house (57%) • Owner occupier (56%) • White British (56%) • 2-4 person household (55%) | <ul style="list-style-type: none"> • Under 35 (45%) • Social class DE (48%) • Student (42%) or unemployed (35%) • Flat in converted house (35%) • Private renter (45%) or social renter (48%) • White non-British (47%), Asian (28%) or Black (25%) • One person (49%) or large 5+ household (47%) |

While differences between ethnic groups are stark, it is worth noting that White non-British, Asian and Black households in the survey were younger than average, and a large proportion live in Hackney, so that it is difficult to separate out the influences of urban living, age, or scheme design from specific cultural barriers to participation.

Even though there are clear differences between social groups and housing types it is also important not to lose sight of the fact that every social group has large numbers of infrequent or non-participants, including nearly 1 in 3 of those in large houses, of social class AB households and older people.

4.3.4. Materials – food items recycled

The research was interested not just in *how much* respondents participate but also, in detail, *how* they participate. The research investigated whether residents know what they *should be* putting in the collection, what they *actually* put in the collection, and whether any aspect of their behaviour is causing contamination.

Material recognition

Recognition that vegetable and fruit items are accepted is well above that for meat (especially cooked). The focus groups showed that people more readily identify the idea of 'organic' or 'composting' collections with food items that can be composted at home; they may also avoid or forget to separate out meat, plate scrapings or sloppy foods.

Frequent users are markedly more confident about what items are accepted: generally ~20% more frequent-users than non-users identify given food items as eligible.

Recognition is good across all socio-demographic groups for all food items (generally 60-90% depending on food and social group) but there are some notable variations. In particular, recognition is weakest for every single food type amongst private sector renters and people living in flats in converted houses. These households are less likely to have seen food waste communications material than others.

Specifically for meat (and plate leftovers for some of these groups too), recognition is notably lower amongst young people, students, those in social class DE, Black residents and White-non-British households. Interestingly, recognition rates are similar in Asian households as in White British households, even though their participation is much lower.

Also worth mentioning is the fact that only 41% of the sample overall think that newspaper is accepted, which will inevitably limit their options for wrapping messy foods. Even though some authorities provide or sell paper liners (and Taunton endorses bio-liners) few or none of the focus group participants were using such liners, including those who knew they were available (see usage data below).

Usage & gaps in participation

Both the quantitative and qualitative research revealed a clear hierarchy of frequently recycled foods. In descending order, they are:

- Anything fruit or vegetable plus tea bags;
- Cooked/prepared items that are not obviously 'meaty';
- Meat, take-away scraps and runny foods.

The small-scale bin analysis of focus group participants showed a similar hierarchy, led by fruit & vegetables (whole untouched items as well as peelings) and bread & cereals (including whole loaves and pizza).

Evidence from all the sources we have shows that raw and cooked meat, dairy products and sauces are the main items that 'go missing' from food recycling collections. Even amongst the households who say they participate in food waste collections 20-30% never recycle such foods (depending on item).

The picture for meat is an interesting one because it varies so substantially between the study areas. Whereas in the mixed FGW collection areas and Hackney there is a significant gap in participation between meat on the one hand and fruit & vegetables on the other, this gap does not exist in the food-only collections in Taunton and Weymouth. Compositional analysis provided by the authority in Bexley confirmed the picture there, showing a higher capture rate for home compostable than non-home compostable food waste.

| % of users saying they recycle item always/most times | | | | | | |
|---|--------|-----------|---------|---------------|---------|----------|
| | Bexley | Cambridge | Fenland | Hackney | Taunton | Weymouth |
| Uncooked fruit & veg | 72% | 81% | 71% | 70% | 74% | 73% |
| Cooked fruit & veg | 72% | 79% | 70% | 68% | 85% | 80% |
| Raw meat | 45% | 40% | 26% | Not collected | 72% | 73% |
| Cooked meat | 53% | 48% | 32% | 44% | 80% | 80% |

This gap between meat and fruit & vegetable recycling is apparent across all population groups, though older service users are more likely to recycle meat than younger users, and affluent users more so than poorer ones.

While users from all ethnic groups recycle fruit & vegetables at high levels, there are very marked differences between them with respect to meat. Here, Asian households who use the service behave similarly to White British users while participation for meat is markedly lower amongst White non-British and Black service users.

Not having access to a garden is also a key influence on meat recycling, reducing participation for this material by ~10 percentage points on average. This factor is reflected in a similar sized gap for *cooked meat* between users living in flats and those

in houses, and dramatically lower participation for *raw meat* from users in converted flats (at half the average rate for this item).

Contamination & the bio-bags issue

While frequent users are more confident about what should go into the collection, there is little difference between them and non-users in relation to some key potential contaminants – notably, oils & fats and bio-degradable bags.

Excluding Taunton (where council endorsed bio-liners are available to buy), the proportion who believe bio-degradable bags are accepted ranges from only 7% (Bexley) to 50% (Cambridge). While authorities said this was not currently a source of contamination, there must be a more general risk that the increasing availability of 'degradable' bags (of whatever kind) at supermarkets will tempt households to use them to wrap food waste.

A particular issue arose in Weymouth where corrugated card is collected but thin card is excluded. Several people in the focus groups found this confusing and were using cereal or detergent boxes as temporary storage for food scraps. This is backed up in the survey where 28% of Weymouth respondents say that thin card is accepted.

4.3.5. Relationship with home composting

Fewer households compost food waste at home than compost garden waste, with 21% saying they dispose of peelings plus raw fruit & vegetables in this way (compared to 28% who compost anything). Very little food apart from these materials is being composted at home, so there is considerable scope to capture cooked and meaty food for centralised composting, even from home composting households.

Indeed, our survey and focus group data suggest that high rates of home composting can co-exist with food waste collection - the two study areas with markedly higher home composting rates (Taunton and Weymouth) also have the highest participation in food recycling. On average across all six areas, nearly two-thirds (64%) of home composting households also use their food waste collection.

The main difference between users who do and don't compost at home is in the nature of the materials that they put into the food recycling collection. Home composters have similar rates of participation as non-composters for meat, plate scrapings, bread and dairy items. But, the picture is very different for peelings and raw fruit & vegetables, where only half of home composting households regularly put these items out for collection, as compared to 80-90% of those who do not compost at home.

The question of whether food waste collections divert material from home composting cannot be answered definitively from the consumer research. The fact that half of home composters put home-compostable material in their collection suggests it may. On the other hand, the focus groups suggest that households may sometimes use the food collection to avoid having too much 'wet' material for their home compost bins to cope with, including fruit & vegetables.

4.3.6. In-home logistics

Previous work (reviewed in the scoping phase) has pointed to the positive role that caddies and liners can play in enhancing participation and capture. Of the study authorities, all but Fenland and Weymouth provide caddies free of charge. Only Cambridge provides liners free of charge (on request), while the other authorities ensure that bags are available for purchase. Our consumer research explored in detail

how people use the facilities provided to them, how they separate and store food, and how they feel about this process.

How households separate and store food waste

The survey identified five principal routes through which food waste gets into the collection bin (% of users employing each option is given in brackets):

- Straight in, unwrapped (24%)
- Straight in, wrapped (24%)
- Via temporary storage in a bag (11%)
- Via temporary storage in a solid caddy or container used without a liner (15%)
- Via temporary storage in a solid caddy or container, use with a liner (21%)

The use of caddies and liners differs markedly between the study areas, being greatest in Taunton and Weymouth where participation is also highest. There is, in fact, a correlation between use of caddies and liners and 'every time' participation. High levels of caddy use are also related to high participation for meat.

| In-home food waste strategies (% of all users) | | | | | | |
|--|--------|-----------|---------|---------|---------|----------|
| | Bexley | Cambridge | Fenland | Hackney | Taunton | Weymouth |
| Straight into food bin | 67% | 50% | 53% | 67% | 35% | 31% |
| Interim storage in caddy or container | 25% | 31% | 25% | 27% | 59% | 43% |
| Interim storage in bag/other | 6% | 17% | 20% | 3% | 4% | 15% |
| Line caddy/container | 11% | 17% | 17% | 3% | 47% | 21% |
| Users as % of total respondents | 72% | 74% | 68% | 51% | 88% | 87% |

The contrast between Taunton (provides caddies) and Weymouth (doesn't provide) is an interesting one because it seems to show that it is not always necessary to supply caddies where the population is likely to be committed to food recycling anyway (i.e. older, White British, owner-occupiers).

From a service investment point of view, there appears to be a great deal of deadweight involved in providing caddies free of charge to all households. Across the four survey areas where caddies are provided, only 20% of households covered by the food waste collection appear to be using a council-provided caddy. The rest either improvise their own interim storage or use none, or they do not participate at all. The proportion varies from 10% in Cambridge, to 14-15% in the two London Boroughs, up to 46% in Taunton, where both overall participation and caddy use amongst users is high.

While only Cambridge households can obtain liners free of charge (paper sacks) a minority of users in the other areas also use liners - either newspaper, bags they have bought themselves or an existing plastic bag.

The risk with allowing households to choose their own liners (which is recognised in the Taunton/SWP system) is that it will lead to contamination, a risk which is enhanced with the increasing availability of compostable and other degradable bags in

supermarkets. Taunton appears to have been especially successful in getting users to buy approved bio-bags to avoid this issue; focus group participants said that bags were easy to buy because they are widely available in local shops. Other authorities were sometimes criticised for making the purchase of bags inconvenient or providing disliked paper sacks.

Users and non-users alike are keen on the idea of bio-degradable plastic liners, especially if these could be tied so as to contain leaks and spills (with the exception of 'green-minded' respondents who think liners are a waste of resources)³⁵. Paper liners were less popular because they are felt to be poor at containing liquid, so do not help to keep caddies or bins clean.

Respondents reckoned they would need between 3 and 14 bags per week, which would clearly be a cost challenge for any authority to bear if bags were provided free. Users are both more willing to pay in general, and willing to pay more per bag. Non-users are especially keen on bio-liners being provided as long as they are free of charge. They argue that this would be fair pay-back for their participation and would minimise the amount they would have to change their existing disposal behaviour (i.e. plate to bag to bin).

The survey evidence suggests, however, that advice on wrapping in newspaper, or ensuring that approved bags are easy to procure, can be just as effective as providing free liners. The decision to provide caddies and liners is a tricky cost-benefit calculation: while it clearly helps people to participate if they want to, and is popular amongst users, it does not guarantee high rates of participation, or engagement by non-users who have reasons for not participating which are unrelated to storage.

Food waste recycling – drivers of public engagement and participation Survey respondents were asked why they recycle food (section 4.4.1) and about barriers they had actually experienced or aspects that deter them (4.4.2). In the light of this, they were then asked what could be done to get more people to recycle food or to encourage them, personally, to do more (4.4.3).

4.3.7. Key motivations

Residents in the study areas seem convinced that recycling food is both a good idea and is generally something they should be doing. Only 1 in 10 do not see why they should recycle food while 78% agree that the environmental benefits of recycling food are important to them.

Less commitment to the idea of recycling food is found in the London areas, amongst students and the unemployed, young people, those living in flats and Asian and Black households (many of whom are young) – though on balance a large majority of these groups agree they should recycle food.

The main (unprompted) reasons why users have chosen to participate are:

- **Feelings around the idea that waste is wrong** – including beliefs that recycling is better for the environment, that people should 'do their bit', and/or landfill space is running out;
- **That it is simply something they should do** – because it is expected of them and/or they feel they should be matching the council's efforts on recycling.

³⁵ Various styles of bio-degradable liners and caddies were kindly provided by Peter Ridley Waste Systems for use in the focus groups. The study authorities also provided liners and caddies to use as stimulus material.

It being an expected behaviour was a more significant motivator amongst Taunton and Weymouth users - and in Taunton this reason outstripped environmental motivations by a significant margin. In both areas, a feeling that food recycling is expected behaviour may also be being supported by high levels of awareness that many other people locally are recycling food – being 80% in Taunton and Weymouth but ~20-40% less elsewhere.

The question about how to build such a strong social awareness, and a shared social norm that we should be recycling food, is a challenging one. Our evidence³⁶ indicates that it is easier to do this amongst older and more settled households; and is most difficult in cities and amongst social groups that are generally ‘hard to reach’ for recycling because these groups tend not to have the same motivations and values around waste³⁷.

This can be illustrated most clearly with respect to recycling of dry recyclables. In our research, there is a strong association between being a food waste recycler and being committed to recycling generally. Three times as many non-recyclers as the average (1 in 3) do not see why they should recycle food. This translates into actual behaviour, where very few (< 1 in 10) of non- or occasional recyclers say they use the food waste collection.

It is worth remembering, though, that not all dry-recycling households are participating for food as well – just under 20% of high recyclers do not use the food collection which is clearly a missed opportunity.

4.3.8. Key barriers

The barriers that non- and lapsed users experience are both practical and deeply rooted in individuals’ psychologies. Some of the key barriers they experience are low commitment to recycling in general, less interest in the environmental benefits of food recycling, and often not having people around them who recycle food.

| <i>Prompted questions % agreeing</i> | Food waste collection | |
|---|------------------------------|--------------|
| | Non-users | Users |
| Do not recycle “as much as I possibly can” | 49% | 19% |
| Don’t see why I should recycle food waste | 25% | 5% |
| Environmental benefits of recycling food are important to me | 50% | 87% |
| Lots of people in this street/area use the food collection | 30% | 74% |

Non, lapsed and occasional users were asked without prompting why they do not use the collection, or use it infrequently. Confirming previous research, the principal reasons for not participating relate to:

- ‘Yuckiness’ – association of food waste with dirt, smells, maggots or vermin
- Food used in other ways – either composted at home or fed to pets
- Not wasting enough food to make separation worthwhile
- Not wanting to make the effort

³⁶ The survey and qualitative research as well as feedback from experts and local authorities.

³⁷ The motivations and barriers of different groups are covered further in section 4.4.2 “Key barriers” and in chapter 7 of the Technical Report.

Perceived mess and yuck

Fears around dirt, smells and maggots are easily the most significant deterrent, even if respondents have never actually tried the service.

Drawing from the focus groups, such fears often appear to be linked to general squeamishness rather than calm assessment of the actual practicalities. Non-users often do not want to touch, see or smell food waste – and they want it to be out of sight as fast as possible. This is a major deterrent to separating food waste in the kitchen or keeping it in a kitchen caddy. The extra work involved in keeping food bins clean is a further deterrent, which users also dislike but choose to tolerate.

Age seems to be an important dimension here: older people appear less sensitive to yuckiness and more willing to deal with it. This ties in with other research on lifestyle trends, which reports an increasing fixation with hygiene amongst younger generations.³⁸

Notably, non-users are far more susceptible to these fears than are users, who rarely report such problems in practice (especially maggots or vermin) or are willing to deal with them if they arise. Non-users also appear to find the collection more difficult to use.

| <i>Prompted questions % agreeing</i> | Lapsed users N= 158 | Non- users N=720 | Frequent Users N=3131 |
|--|-----------------------------------|--------------------------------|-------------------------------------|
| Separating food waste is unpleasant & smelly | 70% | 60% | 34% |
| I'm worried that storing food waste in a separate bin will attract maggots and vermin | 75% | 60% | 37% |
| The Council's food waste collection is easy to use | 47% | 42% | 92% |

According to the survey results, the yuck deterrent is strongest in the three more urban authorities – Cambridge, Bexley and Hackney – affecting 40-50% of non-users there, compared to ~10% to 20% in the other areas.

Perhaps surprisingly, there is no relationship between collection frequency (either food or residual) and levels of concern about dirty bins or maggots. The two strictly AWC systems (Cambridge and Fenland) are at opposite ends of the range on the 'yuck' dimension for non-users while weekly Hackney also has a high proportion of non-users citing yuck factors. Looking at all respondents (not just non-users) Taunton and Weymouth stand out as having the lowest levels of concern about 'yuck' factors.

How food is dealt with in-home also appears to make a difference to perceptions about unpleasantness, fears about maggots and ease of using the collection. Those who put their food waste straight into the outdoor bin have more negative views on these issues than those who use caddies (with or without liners) or wrap food waste in newspaper.

Home composting

Home composting is the reason why around a quarter of non-users (half in Taunton and Weymouth) avoid the food waste collection and is a key driver of occasional use. However, these particular occasional and non-users are – like other home-composting households – generally composting raw fruit & vegetables. There is still considerable scope to capture meal leftovers, plate scrapings and, especially, meat from these households.

³⁸ Brook Lyndhurst for Defra WREP (2006) *Lifestyle Scenarios & Waste Composition, Phase 1 Working Paper*.

Not wasting enough food

Older and retired non-users, and people living alone, mentioned this reason more frequently than others. Households producing little food (which WRAP's research confirms is true of older people) sometimes feel that the amount they would recycle does not justify the effort of re-organising domestic logistics, or the trip to the outside bin where each meal generates only small quantities of waste.

Effort

Some households – nearly 1 in 5 non-users - simply do not believe that food waste recycling is worth *their* while (as opposed to worthwhile in general). This reason is more pronounced amongst young people and those who have little interest in recycling generally. The focus groups were revealing in this respect since many non-users freely admitted that they understood what they were being asked to do but just could not be bothered. This is very different from our experience of the early days of recycling research when non-users were more likely to say they lacked information rather than admit their reluctance to recycle.³⁹

Housing constraints

Non-users in flats⁴⁰ are put off by 'yuck' factors as much as other households and are also slightly less willing to recycle food in general. The most marked difference from other households, however, is reported absence of a bin when moving into a property, especially private rented accommodation. This factor was mentioned both in the focus groups and by a quarter of non-users in flats in the survey.

Other deterrents experienced by those in flats include not having outdoor space for storage and often having very small kitchens where it is difficult to find extra space for a caddy. A further consequence of not having any or much outside space is not having room to clean bins properly.

This factor was also mentioned by those in terraced housing where the bin may be kept at the front of the property but hoses are typically in the garden at the rear. Since few would bring their wheeled bin through the house, this issue immediately raises doubts in potential participants' minds and emphasises feelings that food recycling will be dirty and messy. Similarly, some people in the focus groups said they do not want to carry food waste through their house from the kitchen (often at the rear) to the bin at the front. Just under 40% of non-users in terraced houses mentioned yuck factors as a deterrent, which was far more than non-users in semi- or detached housing (27%).

Other lifestyle barriers

The research also confirms that the lifestyles of those in flats and private rented accommodation – such as students and sharers – can also make participation less likely. Quite often these individuals are young, full-time workers for whom domestic orderliness is fairly low on their list of priorities, or they are sharing with friends and no one person takes overall responsibility for the bins. They may also be fairly mobile households who do not have a consistent experience of recycling, especially in London where service provision varies from borough to borough.

³⁹ e.g. Brook Lyndhurst/RRF (2000) Household Waste Behaviour in London.

⁴⁰ NB Only 6% of households in the survey live in flats because most authorities do not include flats in the service or have few in their area.

4.3.9. Measures to encourage greater participation

Service satisfaction

Before looking at the ideas that non-users have for increasing participation it is worth noting the high levels of satisfaction that users express, but also the improvements they think could be made to the service.

Users in the focus groups were almost entirely complimentary about the food waste collections, including in the AWC areas. When asked in the survey specifically what could be improved, more than half of frequent users could think of nothing. Satisfaction is greatest in Taunton, Weymouth and Bexley which all have weekly food waste collections, though fortnightly residual collection in Taunton and Weymouth. In these areas, up to two thirds of frequent users (63%-67%) say nothing could be improved as compared to ~30%-40% in the other areas.

Amongst frequent users, concern about the collection frequency of *residual* waste is notable only in Fenland, where a quarter would like more frequent collection (compared to less than 5% in all of the other areas). Interest in having *food waste* collected more frequently is greatest in the two areas with strict AWC (Cambridge and Fenland). In Cambridge only, slightly more than 1 in 10 frequent users also mention a bin cleaning service. Where food is collected weekly and residual waste fortnightly few residents appear to be worried about collection frequency (Taunton and Weymouth where under 5% mentioned either as an improvement they want to see).

Participant suggestions

Without prompting, large proportions of non-, lapsed and occasional users fail to come up with suggestions for engaging them in food recycling.⁴¹

| <i>Unprompted question</i> | Non-users N=720 | Lapsed users N= 158 | Occasional users N=404 |
|--|---------------------------|-------------------------------|----------------------------------|
| Nothing | 41% | 18% | 43% |
| Don't know | 12% | 6% | 10% |
| Practical help (e.g. bin cleaning) | 8% | 42% | 18% |
| Collections (e.g. more frequent) | 9% | 33% | 16% |
| Incentives (e.g. council tax reduction) | 9% | 16% | 8% |
| Information | 11% | 6% | 6% |

It seems that it would be easier to persuade lapsed users to give food waste recycling another try than it would be to persuade non-users to start using it. Help with bin cleaning is the incentive mentioned most often by lapsed users reflecting the fact that they are more concerned about yuckiness than non-users in general. 1 in 5 lapsed users would also like to see increased collection frequency whereas this is hardly mentioned by non-users.

When prompted in more detail, the two most popular suggestions for increasing participation (in both the survey and focus groups) were rewarding food recyclers/recyclers in general with a reduction in council tax and providing free caddy liners. The only other aspect that received much mention in the focus groups was

⁴¹ The large gap between prompted and unprompted responses about service interventions that were recorded in our survey highlight the risks of using only prompted questions to unpick what non-users would really respond to. This is a key lesson from the research for local authorities.

promoting information about the end uses of compost (e.g. its use in local parks which promotes a sense for some people that food recycling is giving something back to the community).

Financial incentives and compulsory recycling

As shown above, around 1 in 10 non-users mention without prompting that a council tax reduction would encourage them to participate. This was, in fact, one of the few ideas that non-users could volunteer when asked in the focus groups to role-play a council that is trying to find new ways of persuading people to participate.

Non-users were often vigorous in their support for this idea, many suggesting that it is the council's duty to give them something in return for the extra effort they themselves would need to make to recycle food. This idea of 'payback' is a common theme more generally in recycling research with 'hard to reach' groups. Non-users also – often reluctantly – acknowledge that they may never make any effort unless food (or other) recycling becomes compulsory.

Perhaps of little surprise, reducing council tax is far more popular than making food waste recycling compulsory – when prompted, 82% of all respondents in the survey think a local tax rebate would be an effective means of increasing participation, while half support compulsion⁴². The size of the desired rebate mentioned in the focus groups was often large and reflects the fact that very few people actually know how much of their council tax is spent on waste services.

Views on these incentives differ little between the areas except in Cambridge where significantly more think that compulsion would be effective. There is also little variation between socio-economic and ethnic groups with respect to council tax reductions, but younger people and White British respondents are slightly more in favour of compulsion, as are those already using the food collection service. The focus group discussions suggest that if either of these options were pursued then their application would need to be demonstrably fair (i.e. no free-riders) and cost effective.

Communications & information

While few respondents spontaneously mention a desire for more information – either in the survey or focus groups – when prompted seven in ten (71%) feel that providing more information would be effective in increasing participation in kitchen waste schemes, with little variation according to user type⁴³.

On the one hand, it may be that this is simply an easy initiative to endorse – it certainly will do no harm and takes the onus away from householders. On the other though, it does seem to have particular appeal to groups which could be deemed as more 'transient', and therefore more likely not to have been reached by the full extent of Council communications (for example, 81% of those aged 16-34 and 79% of those living in flats feel that it would be effective). It also carries particular resonance with ethnic minority groups (e.g. 89% of Asian and 90% of Black respondents also feel it would be very or fairly effective).

Reflective of these socio-demographic differences, the idea is also popular in case study areas that have the highest proportion of young people (Cambridge) and of ethnic minority groups (85% in Hackney).

⁴² This is a similar pattern to one observed in Brook Lyndhurst research in London in 2005. GLA, GoL & LWA (2006) *Household Waste Behaviour in London 2005*.

⁴³ The figures range from 69% for non-users to 76% for lapsed users.

Reactions to existing communications materials were explored at length in the focus groups where they received a generally positive response. Design of the materials appears to have followed recognised best practice in recycling communications, so it is not surprising that the aspects liked the most are: colour coding of bins; receiving positive feedback; clarity of instructions; friendly tone; and bin stickers.

Having bin stickers is especially valued and supports a perception that the service is easy to use. Principal thoughts about stickers revolve around:

- Strong support for having pictorial instructions for different food types, to help generally but also with literacy and language barriers;
- Having a sticker for the indoor caddy, or a laminated recipe style card for the kitchen, since this is where separation happens.
- Providing replacement stickers from time to time because moisture in the kitchen or outside means they eventually become unstuck.

People also feel they need reminding regularly and that this is essential so as to capture in-movers who otherwise may not know what to do.

Principal criticisms revolve around the tone used to transmit information about enforcement which some can find threatening, non-users especially – though few respondents have had direct experience of enforcement. Some also express concern that contradictory messages may be conveyed in different booklets or leaflets, especially if guidance on what to do changes over time and people are still referring to out-of-date literature. This is a further reason to provide regular updates.

5 Discussion and conclusions

This research has produced new and unique evidence on the consumer response to food waste collections. Where possible, insights on public attitudes and behaviours have been linked to actual scheme performance data to indicate where action could be taken to enhance participation. Reflecting the main objectives of the work, the conclusions that follow relate to:

- Participation and food waste capture
- Variations in participation and attitudes across socio-demographic groups and housing types
- The effect of service factors on behaviour
- The role of communications

Participation and food waste capture

The research has shown that well-run food waste collections can generate high levels of participation; they can capture ~20%-50% of available food waste; and be widely supported by residents. The highest performing schemes in our study are capturing around 90-100 kg/hh/yr of food waste.

Participation is generally stronger for home compostable materials (fruit & vegetables) than for meat, meal scraps and runny foods. The loss of such materials from collections seems to be more about reluctance or forgetfulness than lack of knowledge that such items can be recycled. Several reasons contribute here: the identity that 'organic' or 'compostable' material has in individuals' minds (i.e. fruit & vegetables); reluctance to have contact with more 'messy' foods; and believing that food waste collections offer nothing extra than if foods are home composted.

Barriers experienced by lapsed and non-users are in many cases both practical (e.g. lack of space) and related to personal norms about two important things – the personal value of recycling, and squeamishness about ‘rubbish’. Non-users’ fears about separating food from ‘normal’ waste are a big emotional hurdle to overcome and they can easily overwhelm people where their interest in recycling is low anyway. This combination of squeamishness and low interest is often at the heart of feelings that recycling food is not worthwhile. The requirement here is to build a stronger social norm specifically around food waste recycling, and to continue to demonstrate to the public why recycling in general is necessary.

Another group that needs to be persuaded are those who think that they do not create enough food waste, or think they compost as much as is possible at home. They may need a different kind of advice from generally disinterested non-users because they may already be committed to recycling for other materials. Help here may need to include targeted reminders for the materials that are routinely ‘missing’ from collections; and perhaps also the offer of smaller food bins in areas which currently only provide wheeled bins which people may feel aren’t worth getting dirty for the small amount of food they could put in.

More generally, non-users find it hard to identify what would encourage them to start recycling food. Some sort of ‘pay-back’ is the only option mentioned by more than a few (e.g. bio-liners or local tax rebate). Caution needs to be exercised in interpreting this apparent desire for reward, however, because it is hard for people to say to researchers that the only thing that will motivate them is the opposite – i.e. compulsion or charging. Some non-users reluctantly volunteered that this would, ultimately, be the only thing that would motivate them. Providing financial rewards for food waste recycling may anyway introduce perverse incentives that deter home composting of food or undermine efforts on prevention, which would clearly not be desirable.

Variations across socio-demographic groups and housing types

The distribution of barriers to food waste recycling across social groups is broadly similar to that routinely observed for dry recycling. The research has shown that maximising participation will be hardest in urban areas, places which have large numbers of young people or minority ethnic households, amongst those living in low-rise and conversion flats, and in neighbourhoods with high residential turnover. Maintaining good participation in areas of private rented properties appears particularly challenging.

The research has shown that households living in terraced houses tend to have a stronger experience of ‘yuck’ and ‘hassle’ around food waste recycling than those in larger homes. This experience is often related to a lack of side access, having small gardens at front, or having to carry food waste through the house. These households may need extra help or reassurance about dealing with such deterrents (e.g. caddies and liners, support on bin cleaning).

The study cannot be conclusive about the best way to provide food recycling to high rise flats and more research focusing specifically on this issue is required. Similarly, more detailed exploration of differences *within* the broad heading of ‘minority ethnic households’ is required to be able to separate out effects such as age (e.g. younger or older Asian) or differences between different cultures (e.g. Black African or Black Caribbean).

Effect of service factors on behaviour

The study supports the emerging evidence that food-only systems capture more food waste per household than mixed FGW services. Moreover, the effectiveness of food-only systems appears to be maximised where food waste is collected weekly and

residual waste fortnightly⁴⁴, and overall bin capacity for all streams is restricted (e.g. through a no side-waste policy). More evidence is still required, however, which compares mixed FGW and food-only systems in like-for-like settings (e.g. urban systems, areas with a less 'settled' socio-demographic structure than Taunton and Weymouth).

The study also indicates that a majority of households happily cope with AWC of residual waste, especially where food waste is collected weekly. Alternate weekly collection of residual waste appears to provide a good incentive to recycle food.

Households who use a caddy or wrap their food waste before recycling are less likely to have concerns about 'yuck' factors, which introduces the question of whether caddies and liners should be provided free of charge. Even in areas where these are provided, usage rates – when averaged over the whole household population rather than just participants – does not appear to justify universal provision.

However, there are two aspects which support a case for caddy provision; first, a link was noted between caddy use and commitment to food recycling; and second, those who might be described as 'marginal' participants are more sensitive to fears about dirty bins and smells. The latter group could need more help to participate than committed users who may be more inclined to improvise their own interim storage. Caddies also act as visible reminders to recycle food.

As regards liners, the experience of Taunton in particular suggests that liners do not have to be provided automatically as long as residents can obtain them easily from town centre shops. The WRAP trials provide additional evidence on the use of liners⁴⁵.

Communications

Authorities covered in the study appear to be doing a good job on communications, having learned a great deal from their experience on dry recycling. Residents' recognition of which materials are collected is high and contamination levels are low. A key to success in the study areas has been the clear do's and don'ts guidance issued to households.

Poor material recognition appears not to be a significant barrier to participation, and is certainly less important to non-users than their underlying fears about mess, smells and maggots. Since this fear is often not backed up with balanced evidence or first-hand experience, communications content needs to help residents make more informed judgements on this issue. Signposting households to practical help with bin cleaning – perhaps backed up with introductory 'money-off' promotions – may also be worth exploring.

Working with local media to supply them with robust and balanced facts should help to prevent other communication work being undone by scare stories based on anecdotal evidence from a handful of households. Examples from the case study areas and local authority interviews show that relationships with the media can be positive.

To increase capture, the research also demonstrates a case for more intensive promotion on meat, meal scraps and runny foods at local level, especially in mixed FGW collection areas and where home composting rates are high. In relation to meat or scraps it may therefore be worth giving some everyday kinds of examples (e.g. we want your chicken bones, pizza crusts, the take-away you bought too much of etc) backed up by pictures.

⁴⁴ Confirmed subsequently in the WRAP food waste trials which post-dates our research. WRAP (2008, updated 2009) *Evaluation of the WRAP separate food waste collection trials*.

⁴⁵ WRAP, *ibid*.

The Weymouth example - where there is some confusion about types of card – also shows how important it is to communicate in terms and language that make sense to consumers (many, for example, think of all types of card as the same thing).

A more strategic issue, and potentially one that needs to be tackled through national level communications, is the current lack of a social norm for recycling or minimising food waste.⁴⁶ The topic is relatively new to consumers and they have few reference points about what they are supposed to do. Should they be recycling it? Composting it at home? Reducing the amount they make in the first place? Thinking about it at all? Significant problems are that:

- Consumers do not know that food is one of the biggest contributors to municipal waste in the UK;
- Food waste is at least as important as packaging in terms of its impact; and
- They are largely unaware of how it is dealt with once it leaves their home (myths include feeding pigs or sending straight to landfill).⁴⁷

Almost none know that centralised composting may involve a high tech process, that this needs specialised buildings and equipment, and that it may involve the useful recovery of energy. Frequent users seem to be interested in this knowing more about this aspect.

Fortunately, this research has demonstrated that many users are participating simply because they feel it is expected of them as part of the council's overall waste package. However, lack of interest or weak belief in the benefits of food recycling can also be a key barrier for non-users. The challenge for the future is how to join up the various initiatives being developed currently to divert/reduce food waste to ensure that consumers receive seamless rather than confusing messages, and can identify with a strong call to action on food waste.

6 Implications and ideas for further work

The research has generated a great deal of detailed information about specific participation issues for different kinds of participants. Instead of repeating them all here, the final sections focus on generic implications for local services and communications, then on the implications for Defra's waste evidence programme and food waste strategy.

6.1 Local food waste collection services

Questions about the optimum design of food collection systems cannot be answered definitively by this research because that was not its purpose. Authorities need to take into account not only the evidence gathered here but also other research that has focused on the cost-benefit profile of different systems and other aspects of performance. Based strictly on the evidence presented in this report, a number of comments can nevertheless be made:

Service style – authorities should not dismiss alternate weekly residual collection out of hand, even if there is initial public opposition, because this research supports the emerging case that food-only systems with weekly food/alternate weekly residual

⁴⁶ WRAP's new Love Food Hate Waste campaign is tackling the prevention angle but figures have not yet been released on its early impact.

⁴⁷ Each of these dimensions has been logged in this current research and/or Brook Lyndhurst work for WRAP.

collection achieve the best performance. The public's vocal fears should be treated with respect but the views of the silent majority need to be heard too. The evidence gathered here shows that food waste collections can achieve high levels of public support once introduced, especially where food waste is collected weekly, even if residual waste is collected fortnightly.

Intensive monitoring/enforcement in the first few weeks – was a key tip proffered by collection authorities who advised that behaviour needs to be steered early on before 'bad habits' become entrenched – e.g. using plastic bags as liners. This can be achieved through rejecting bins with significant contamination in the early weeks, supported by informal doorstep feedback and advice to households in areas with high contamination.

Caddies and liners – extrapolating from the research findings, it may be more worthwhile to spend funds on ensuring widespread and easy access to retail outlets for approved liners than to provide free liners to every household. Accessibility is key to ensuring good usage, so authorities should take a consumer-focused approach in deciding which channels to use for supply of either caddies or liners (e.g. are retail channels - including on-line ordering - accessible to working households, people who live in remote rural areas, those on low incomes, and so on?).

6.2 Local communications

Many of the implications arising from the research apply to communications⁴⁸.

Seamless advice on food waste recycling, home composting and prevention - there is clearly a risk that different food waste initiatives could lead to confusion. The public needs clarity especially about the complementarity of home composting and food waste collection, as well as continuing encouragement to recycle food items that cannot be composted at home.

Bin stickers - these are effective at communicating do's and don'ts but may get lost (e.g. in high mobility residential areas), unstuck or faded. Local authorities should budget for replacement bin stickers at reasonable intervals. 'Transient' areas should be targeted for regular bin-availability checks.

Targeting missing foods – once services are up and running, householders need specific reminders about meat, scraps and mushy foods. Using everyday language for specifically targeted items may help, as could promotions around seasonal food or festivals.

Consumer-friendly language – could also be used to support the idea that food recycling is simply an extension of what people already do to 'help out'. On the basis of the research, the team feels strongly that the term "food recycling" is preferable to "food composting" or "kitchen waste" because both terms are interpreted ambiguously. "Kitchen waste" may deflect attention to packaging, because this is more prominent in consumers' minds; "composting" runs the risk of being rejected by people who do not identify with the image of home composting. The fact that recycled food is composted is of interest to consumers but this can be communicated effectively without it being the lead idea.

Translation – most authorities who engage with non-English speakers are well practised in translation. Even so, warnings were offered that authorities need to make sure that equivalent words exist in other languages, and that the meaning carries from

⁴⁸ See also WRAP's communications case study, developed from the evidence from its food waste trials. http://www.wrap.org.uk/downloads/Case_study_D_-_communications_FINAL_29_09_08.dfb41129.6405.pdf

one language to another. This isn't always the case. Similarly, pictorial images (e.g. of food) need to reflect and appeal to the diversity of local residents' ethnic and cultural backgrounds⁴⁹.

Minority ethnic households – local authorities have a great deal of experience in reaching such audiences which they will build upon in tackling food waste. Since food is generally such an important part of cultural identity in all cultures, community outreach work to unpick specific issues or barriers may be required. It is worth mentioning here that many community-based organisations and faith groups are working on sustainable food issues, or supplying food in communal settings, and local authorities should consider whether to work with them on food waste issues.

Migrants from Eastern Europe – this group is singled out simply because local authorities have less experience of communicating with households from these areas, not because they cause particular issues for service delivery. It would be useful to facilitate the sharing of best practice in this area as it develops, as has already been done for other major ethnic groups. There is a role here for consolidation of the evidence and case studies from local authorities' experience.

Dealing with fear – two types of action are indicated: advice centred on wrapping food and simple actions to prevent dirt, flies or maggots; signposting, for example to suppliers of approved liners or bin washing. Providing an enquiry line during the early weeks of a new scheme can also help⁵⁰.

Feedback – this supports residents who need reassurance that there is a purpose to food recycling beyond it simply being what the council tells people to do. Demonstrating how much extra food recycling adds to the overall recycling total is potentially powerful information.

Transience & areas of high residential mobility – authorities which have large numbers of 'transient' households may need to devote extra spending to communications, to enable them to run programmes such as regular bin-availability checks and doorstepping campaigns. Private landlords should perhaps be consulted on the best ways of ensuring that their tenants receive recycling advice when they move in (e.g. like tenant handbooks in social housing).

6.3 Defra

Many issues raised in the research have implications for food waste research, strategy and policy. Three central ones are flagged here:

6.3.1. Data

Defra-sponsored initiatives (Waste Data Flow, WREP, and WRAP research) have contributed greatly to the database on food waste but some fundamental gaps and flaws remain. In particular, it is difficult to assess the relative merits of different food collection systems – for example, food-only or mixed FGW, and optimum collection frequency. Areas which need attention are:

- Consistent, robust data on the food fraction in mixed FGW systems and how this varies seasonally;

⁴⁹ Luton, for example, has used Bollywood styling on its posters to reach Asian audiences. These images are shown in WRAP's food waste trial evaluation report.

⁵⁰ As outlined under "Key Barriers" above, these problems are rarely reported by people who actually use the collection; fears are greater among those who have never used the service; and the data show that fears tend to be linked to wider feelings about dirt, mess and the effort needed to recycle. The WRAP trials showed a similar pattern.

- Estimates of household numbers (in WDF and more generally) which are crucial where time series data on kg/hh are being derived;
- The comparability and quality of existing compositional studies and reconciling these with data in WDF. Especially with respect to capture rates, comparisons between studies are compromised because the effect of socio-demographics or seasonality cannot usually be stripped out;
- Analysis frameworks and definitions used in compositional studies which may make it difficult to identify the food fraction, and certainly different kinds of foods;
- Data on caddy and liner usage and its impact (though the WRAP trials add to the evidence base here); also cost-benefit ratios and estimates of deadweight and wastage.

Suggestions for future work flowing from these observations are:

- On-going monitoring and consolidated analysis of the relative performance of different styles of food waste collection systems. Such data would support the many local authorities who will be introducing food waste collections in the next few years, helping them to make efficient choices suited to their areas. Consolidated and timely performance data would also be of value to researchers and would avoid the risk of duplication of research effort.
- Further research may be worthwhile on actual participation monitoring and capture rate analysis in the authorities covered in this study, to be conducted on a consistent basis, in order to further substantiate the conclusions we have made on collection style and frequency. It may be worthwhile to extend such a study to other areas to allow for paired analysis of mixed FGW versus food-only systems in like-for-like demographic settings. The purpose of such a study would be to provide large-scale evidence that can end the on-going debate about which system is better from a tonnes recovered point of view, mixed FGW or food-only schemes, and at what collection frequency. We recognise that such a study would be costly.
- Capture studies often do not identify the food waste fraction separately, or provide any detailed information on different food types. WRAP has developed a food waste classification system for compositional studies which can identify what types of food are available to target for recycling or are 'missing' from collections⁵¹. Guidance on using WRAP's classification could usefully be disseminated to local authorities in order to support best practice in identifying what is available for collection.

There are also some areas which have yet to be researched in depth because food waste collections in the UK are too new. Suggestions for further evidence gathering work are:

- The relative performance of different systems in high rise blocks and public attitudes of residents;
- More specialised research on minority ethnic households which recognises the diversity of experience within and between groups that tend to be lumped together in more general surveys. A series of qualitative case studies on individual ethnic groups, which could include Eastern European migrants, is one way forward.

6.3.2. Support to local authorities

In addition to the decision-making support for local authorities outlined above in relation to data, there is one further recommendation arising from the research: local authorities with high concentrations of the kinds of 'hard to reach' residents identified in

⁵¹ WRAP (2008) *The Food We Waste*.

the research will require additional support to achieve reasonable or good rates of participation in food waste collection. Inner cities especially may need extra support because of both the nature of their housing stock, the characteristics of residents, and residential mobility.

This reality may mean extra expenditure on, for example, providing liners or communications and outreach, or other activities that the authorities devise themselves. Whether or how to support extra financial demands of this kind needs further consideration, including the off-set of costs against the potential waste and carbon benefits of helping non-participants to engage with food recycling.

6.3.3. Communicating about food waste

National leadership is required on:

- Establishing the case with the public that they need to adopt much more environmentally sustainable behaviour on food waste;
- Providing guidance on how potentially competing messages on prevention, home composting and recycling food should be presented as a package, and how the public should prioritise their behaviour. The messages emerging in the public domain need to be joined-up because the public generally has little grasp of the waste hierarchy;
- Ensuring that the best available evidence on the merits of different collection systems is disseminated as widely as possible, including to the public, so that *all* stakeholders can make informed choices suited to their local area. For example, evidence about the benefits to food waste recycling of fortnightly refuse collections need to be communicated widely so as to support the local authorities who choose to operate that kind of system.

Continuing national level communications work is therefore needed to support the development of a social norm about sustainable food behaviour (in all its guises); and the public needs to hear positive messages about food waste recycling if the benefits of collections are to be fully realised.

Appendix – Demographic breakdown of achieved survey sample in case study areas and total combined survey sample with national population comparison

| | Age (% of adult population 16+) | | | Students | Social Class | | | Ethnicity | Tenure | | | Housing type |
|-------------------------------|------------------------------------|-------|-----|----------|--------------|------|-----|------------------|-------------------|-------------------|--------------------|-----------------|
| | 16-34 | 35-54 | 55+ | | AB | C1C2 | DE | White British | Owner Occupied | Social renters | Private renters | Flats |
| Bexley (n=760) | 18% | 40% | 42% | 1% | 10% | 64% | 18% | 91% | 82% | 7% | 5% | 1% |
| Cambridge (n=776) | 28% | 37% | 35% | 4% | 29% | 52% | 19% | 91% | 66% | 22% | 11% | 11% |
| Fenland (n=720) | 21% | 36% | 44% | 3% | 11% | 45% | 39% | 96% | 76% | 13% | 9% | 3% |
| Hackney (n=698) | 32% | 40% | 28% | 6% | 17% | 43% | 36% | 49% | 46% | 37% | 13% | 17% |
| Taunton* (n=718) | 16% | 36% | 48% | 1% | 26% | 48% | 22% | 97% | 76% | 15% | 8% | 4% |
| Weymouth** (n=759) | 15% | 33% | 52% | 1% | 22% | 55% | 18% | 97% | 87% | 9% | 4% | 1% |
| Total combined (n=4431) | 22% | 37% | 41% | 3% | 19% | 51% | 25% | 87% | 72% | 17% | 8% | 6% |
| National average | 31% | 35% | 35% | 4% | 23% | 49% | 28% | 92% | 69% | 18% | 13% | 17% |

Base: 4,431 completed interviews.

*Taunton Deane **Weymouth & Portland

"National" data sources: age = England & Wales, 2008 (ONS); social class = UK, Market Research Society 2006 based on 2001 UK census; ethnicity = UK Census 2001; tenure = UK, 2007, Communities and Local Government; Welsh Assembly Government; Scottish Government; Department for Social Development, Northern Ireland; flats = England, 2007, ONS.