

Research Summary

Understanding Food Waste

Key findings of our recent research on the nature, scale and causes of household food waste

Introduction

Each year in the UK we throw away about one third of all the food we buy and at least half of this is food that could have been eaten. At WRAP (Waste & Resources Action Programme) we have committed ourselves to working with retailers, consumers, local authorities, community groups and other stakeholders and partners to reduce consumer food waste by 100,000 tonnes by March 2008. One of the ways we will achieve this is through the development of a new consumer-facing food waste campaign.

We have recently commissioned a number of major research studies with consumers in the UK to be used as an evidence base for the campaign, which is due to be launched in the autumn of 2007. These studies are aimed at understanding all the issues around food waste better, including consumers' knowledge, attitudes, beliefs and behaviour. We have also commissioned projects that explore ways to engage consumers in tackling the problem of food waste.

All these new studies have been designed to give a deeper insight into consumer behaviour throughout the entire food purchasing, storage, preparation, consumption and disposal process – from shopping list to bin.

This document is a summary of our key findings. It highlights the general themes that have emerged.

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The Scale of the Problem

Food waste is a big problem in the UK. Our estimates suggest that we throw away as much as a third of all the food we buy; and at least half of this is food that could have been eaten, if we had only managed it better. The rest is inedible, for example vegetable peelings, tea bags and meat carcasses. Overall around 6.7 million tonnes of food waste is produced by households – that's about a fifth of our domestic waste. We are all concerned about the amount of packaging that we have to deal with, but in reality the amount of food wasted by households in the UK is even greater.

In the UK, the vast majority of food waste ends up in landfill. As food rots in landfill it can produce methane, one of the most potent greenhouse gases and a significant contributor to climate change. When we throw food away, we also waste all the carbon generated as it was produced, processed, transported and stored. This is particularly important given that the whole food supply chain accounts for around 20% of the UK's greenhouse gas emissions¹. We could make carbon savings equivalent to taking an estimated 1 in 5 cars off the road if we avoided throwing away all the food that we could have eaten.

Apart from damage to the environment, throwing away food that could have been eaten is also a considerable waste of money. Our current figures suggest each week a typical household throws away between £4.80 and £7.70 of food that could have been eaten; this is equivalent to £250-£400 a year or £15,000-£24,000 in a lifetime².

¹ Uhlin, S-E. (1997) *Energy flows in the food chain* (Report No. 4732) Stockholm: The Swedish Environmental Protection Agency.

² *Exodus Diary Research: Kitchen Diary Top Line Results Based on 284 Diaries* and analysis by WRAP based on Defra's Expenditure & Food Survey 2004 / 5. Further detail is available from WRAP on request.

So the scale of the problem is clear. So are the main causes. We throw away more food than packaging³; we buy too much food and we shop without a list⁴; we set our fridges at too high a temperature so food goes off too quickly⁵; and, not surprisingly, too many of us (at least 6 out of 10) end up throwing food away because it has passed its 'use by' date⁴.

³ Analysis by Julian Parfitt of WRAP based on compositional analyses and municipal waste statistics, March 2007; this includes all packaging not just food packaging.

⁴ Exodus Market Research (2006) *A quantitative assessment of the nature, scale and origin of post consumer food waste arising in Great Britain 2006* (report to WRAP; currently unpublished)

⁵ World Health Organisation, 2005

Who Wastes Food?

Nearly all of us waste food. Almost everyone we surveyed admitted to wasting at least some food; our research⁶ indicates that 30% of households are 'high food wasters', 27% are 'medium food wasters' and 43% are 'low food wasters'. High food wasters are more likely to be:

- younger working people (aged 16-34);
- families with school age children

Even though there are socio-demographic differences in terms of how much we actually waste, the results show that this is an issue that affects nearly everyone.

The research uncovered other important factors. More affluent households are likely to produce more vegetable waste than less affluent households. The larger the family the larger the quantity of food consumed and waste discarded, though waste per capita for larger families is lower. Families with children also tend to be bigger wasters than those without, although this is offset to some extent by economies of scale that come with catering for larger numbers.

Other evidence suggests that those who can least afford to waste food may waste the most, since they are less likely to plan ahead and more likely to have a 'live for today' attitude⁷.

⁶ Brook Lyndhurst (2007) *WRAP Food Behaviour Consumer Research* (report to WRAP; currently unpublished)

⁷ Institute of Grocery Distribution (2005) *Food Waste in the UK* (report to WRAP; currently unpublished)

How Aware Are We of Food Waste?

Many of us don't appreciate the quantity of food we waste. It's so routine and ordinary to throw food away that we just don't think about it. One of our research studies⁶ found that 90% of us claim that little food ("some", "a small amount", "hardly any" or "none") is wasted in their household. But the figures don't stack up. If that's true, the other 10% of us must be wasting almost all the food we buy, given the 6.7 million tonnes that we collectively generate.

To help get to the bottom of the issue, we asked nearly 300 households to keep a diary of the food they wasted during the course of one week⁸. At the end of the week we asked them whether they were surprised by what they recorded. Two-thirds of households had changed their minds about how much they thought they were wasting; many were surprised at the quantity of inedible waste such as teabags and peelings they produced. Although this waste is inevitable, much of it can easily be composted at home, so that at least some value is extracted from it (www.recyclenow.com/home_composting). Equally more and more councils are starting to collect food waste for composting on a large scale.

⁸ Exodus Market Research (2007) *Food Diary Research: Kitchen Diary Top Line Results Based on 284 Diaries* (interim project report to WRAP; unpublished)

What Do We Waste?

Though it's clear no-one actually plans to go to all the trouble of preparing food only to throw it away, that's exactly what happens in many households.

We discovered that people believe more food is thrown away after it has been prepared than as raw ingredients. Almost a third of people (32%) say they throw away a significant amount of food left on the plate and almost a quarter (24%) say they often throw away significant amounts of food prepared but not served, or products opened but not finished⁶. This perception doesn't fit with other evidence, though, which suggests that there is more raw food in the bin than cooked food³ and seems to support the findings of our diary work that we are particularly bad at recognising the quantities of peelings, offcuts and by-products like tea bags that we throw away. However, this is partly explained by the inedible elements of food waste not being perceived as 'a waste' in the same way as waste from food prepared but not eaten.

Our survey research⁶ found that the most frequently cited uncooked food waste items (56%) are inedible peelings and bones. Our diary research⁸ supported this but went further, finding that the items most commonly thrown away are tea bags, banana skins, peelings and egg shells².

Of the potentially edible food, our survey research⁶ found that the most frequently wasted is fruit and vegetables (30% throw away significant amounts), bread and cakes (20%), raw meat and fish (16%) and ready meals / convenience foods (also 16%). This is consistent with information from the Prudential's Soggy Lettuce Report⁹ in which the top five most frequently discarded items were listed as lettuce/bagged salad, bread, fruit, milk and cooked meat; more than half the shoppers surveyed for this study said they often threw away lettuce, bread and fruit.

⁹ Prudential UK (2004) *Soggy Lettuce Report: Are we a nation of wasters?*

Why Do We Waste Food?

Why do we waste so much food? The simple answer is we buy more than we need and we throw away food that is still perfectly edible.

The underlying reasons are diverse: from a change of mind to a change of plan; from an unwillingness to eat leftovers to a lack of knowledge of how to use them; from too little storage space to confusion over whether products can be frozen. This is a complex issue, which a major survey by Brook Lyndhurst sought to address⁶. The study identified more than 30 reasons for food waste in the home including:

- buying too much – particularly being tempted by special offers e.g. 'buy one, get one free' (BOGOFs);
- buying more perishable food – often as the result of trying to eat more healthily;
- poor storage management – not eating food in date order (choosing food on impulse, often driven by 'spontaneous' and 'top up' shopping);
- ad hoc, rather than methodical, 'spring cleaning' of stored products;
- high sensitivity to food hygiene – 1 in 5 say they won't take a chance with food close to its 'best before' date, even if it looks fine;
- preparing too much food in general;
- not liking the food prepared – 22% of families with children stated that not liking a meal was a cause of food waste; and
- lifestyle factors – not having the time to plan meals, or having fluid work and social patterns – particularly true of young professionals.

In the Home

Pre-shop planning

Our research underlines the importance of food management even before we leave home to do the shopping. More thoughtful pre-shop preparation, including menu planning, checking of what ingredients are in stock and compiling – and sticking to – a shopping list are all routes leading towards less food being wasted. This backs up other research that found a lack of planning makes home cooks wasteful¹⁰.

But only about two-thirds of us make a shopping list most of the time, and almost everyone surveyed – with the notable exception of older consumers – confessed to overshopping⁴.

An Ipsos MORI study for WRAP¹¹ shows a clear divide between those of us who plan before we go shopping and make a list, and those of us who make up our minds once we are in the store. Even some of us who write lists say we use them more as reminders for key items, rather than a definitive plan.

Indeed, less than half (48%) of us who do write a list (or make a mental list) stick to it most of the time and only a quarter of us are never or rarely tempted to stray from the list and buy unplanned items. The figure is higher for those of us with children; 44% of shoppers with children stray from the list at least sometimes⁴. Again, those of us who are older are much more likely to make lists and waste less.

¹⁰ Institute of Grocery Distribution (2004) *Consumer Watch: Home Cooks* Issue 9

¹¹ Corrado, M; Butler, S; Slaymaker, J; Robey, R (2006) *Understanding consumer food management behaviour* London: Ipsos MORI Social Research Institute

Impact of Lifestyle Choices

The trend towards healthier eating can have unforeseen impacts on food waste. There is evidence⁶ that the focus on the health advantages of fruit and vegetable consumption is encouraging us all to buy an increasing amount of fresh produce, a significant proportion of which is wasted. The issue is intensified when one person buys food for everyone else in the household and wants to provide healthy options for them all. So, though our motives are good, the benefits are only achieved if we eat the healthy food we buy. If we don't, we only add to the food waste problem.

Health concerns in relation to food date stamps can also lead to more waste. People we surveyed often mentioned the passing of the date stamp as a key reason for throwing away food⁴ and a large majority of people said they *never* eat food past the date⁶. However, though most of us claim a good awareness of food labels and the majority of us think they are easy to understand, actual understanding of some types of label information remains poor. In other words we are not as well informed as we think we are.

The 'use by' date is an instruction applied to foods, such as fresh meat and fish, where serious forms of food poisoning are a real risk; whereas a 'best before' date is advisory and tends to be applied to low risk foods and those with a longer shelf life. While food quality is likely to decline after the 'best before' date has passed, health issues are not likely to be a problem. The Food Standards Agency (FSA) found that only one-third of people correctly interpreted these terms and more than one quarter thought that food past its 'best before' date could be unsafe and should be thrown away¹².

There is also a difference between attitudes to labelling in store and in the home. We readily use date labels to maximise the shelf

¹² Food Standards Agency (2006) *Consumer Attitudes to Food Safety 2005*

life of the products we buy whilst in store by, for example, reaching to the back of a shelf to get the freshest item, but once we get home we tend to forget all about how to use date labelling to improve stock control and about using food items in date order so that they don't get wasted¹¹.

Fresh moves

The trend towards over-shopping is exacerbated by another healthier lifestyle choice – the move to chilled and fresh food⁷. Many of us are turning away from ambient and frozen foods and more traditionally preserved items like tins and pickles, all with a longer shelf life, and buying more chilled and fresh products, with a shorter shelf life – and, therefore, with the potential to increase food waste levels.

Post-shop storage

In general, we found evidence of poor understanding of storage requirements in the home. Many of us are unaware of the importance of keeping food at the right temperature and of what foods can be frozen¹¹. Fridges are often too warm⁵ and many of us have a poor grasp of stock control skills and an inability to make use of existing food stocks before going out and buying more⁷. The combination of these factors, along with a dramatic increase in the amount of fresh and chilled food on sale, is increasing the amount of food being wasted in UK homes.

In general, the evidence suggests that poor home economics skills are a key factor in the amount of food being wasted. Interestingly, in spite of typically high waste habits, young families appear to be reasonably proficient – in line with the average, at least – in these areas.

The more equipped we feel in areas such as pre-shop planning and cooking skills, the less food we claim to throw away, yet our research⁶ shows that only around 1 in 4 of us are comfortable across all food management areas.

In the kitchen

We could learn a lot about food waste from our elders. Older people among us tend to prepare more from scratch and plan better, making just the right quantities. They hate waste and waste the least. Families with children buy with the children's tastes in mind and often cook separate meals for children and adults in the family, exacerbating waste problems^{4, 11}.

Is de-skilling in the kitchen to blame? In schools, Home Economics has been replaced in the National Curriculum by Food Technology, with its emphasis on the science of food rather than its management, preparation and cooking. Certainly the young amongst us do not show much interest in culinary skills, with 50% of those under 24 saying they do not cook anything from scratch and have no skills to make use of leftovers⁷.

At the dinner table

In many households mealtimes are no longer a central part of family life. This has been dubbed the 'casualisation' of meals. For example, in 1994 a meal took us on average 30 minutes to prepare; in 2004 we took just 19 minutes. And we eat together as a family less than we used to; in 1994 34% of meals were eaten alone compared with 54% in 2004⁷. And there is no doubt that unpredictable eating patterns make planning meals – and therefore planning shopping trips and minimising food waste – more difficult⁷.

Dealing with unavoidable waste

At WRAP our strategy in relation to all waste follows the *waste management hierarchy* in which reduction is better than reuse and reuse is better than recycling or composting, and all of them are better than disposal. While the reduction of food waste that could have been eaten, for example by making better use of leftover items, is an obvious target for a campaign, there are also opportunities to improve the way we handle the unavoidable waste when it comes to getting rid of it.

Home composting is a good way to make better use of peelings and other compostable food waste. Recycling compostable food waste into compost is cheaper than other forms of waste treatment, and unlike landfill does not generate significant levels of methane.

WRAP's own statistics show that 35% of UK households with gardens now home compost, and that more people are using their compost bins for peelings, vegetable scraps and tea bags as well as for garden waste¹³. Higher-income, older participants are more likely to be aware of the benefits of composting while take-up of composting is most notably low among young low-income families and students because fewer have gardens or an interest in gardening.

We are all concerned about throwing away plastic and other waste perceived of as non-biodegradable but less so about biodegradable waste which is not generally regarded as an environmental problem. We found, for example, that 40% of people thought that food thrown away is not an issue because it is 'natural and biodegradable' and that nearly three quarters of people thought that packaging was more of a problem than food

¹³ Based on various reports to WRAP and included in the WRAP Home Composting Diversion Model

waste. But, as already said, food waste *is* an environmental problem.

At the Supermarket

The influence of retailers

Retailers are extremely influential in our purchasing decisions and will be a key stakeholder in solving the problem of unnecessary food waste. Supermarkets clearly dominate food shopping trips¹¹,¹⁴ with the majority of consumers undertaking a weekly shop, with 'top up' trips in between.

Some shoppers believe more trips means more waste, others see top up trips as a better way to purchase fresh items like fruit and meat, leading to less waste¹¹. At WRAP we believe further research into the frequency and nature of shopping trips, probing more deeply the difference between 'main' and 'top up' shopping, is required.

On-line retailers such as Tesco, Sainsbury, Waitrose/Ocado and Asda already provide several helpful functions – such as the ability to create and amend on-line shopping lists – and they are starting to provide help with waste reduction. For example, some on-line sites offer the automatic fulfilment of on-line recipes or databases that help consumers to put leftovers and ingredients together to create meals.

Is it really a bargain?

Many of us confess to the lure of the 'BOGOF', being tempted by special offers to buy either more than we need or to impulse buy an unplanned item¹¹. Though they are presented as money-savers, many of us will readily admit that such items often end up thrown away uneaten. Bigger packs are another temptation that can lead to increased food waste^{3, 7}.

¹⁴ Marketry (2006) *Consumer research into self dispensing systems* (unpublished presentation to WRAP)

For WRAP the key issue is not promotions in general but promotions that encourage the purchasing of goods that are likely to end up being thrown away because, for example, they spoil. This is relevant because one of the most common food categories for impulse buys is chilled food¹⁵.

Retail promotion clearly has a big influence on impulse purchases and, positioned correctly, could be seen as a driver to less wasteful purchasing. For example, retailers have recently begun to try different, less wasteful retail promotions for food products; for example, offering customers five items of fruit and vegetables for the price of four to provide the ingredients for a meal, rather than two punnets of tomatoes for the price of one. Also, as we learn more about food storage and management, we would be more able to reap the benefits of promotions, while wasting less.

The influence of children

All our research suggests that the influence of children on food waste is significant. Shopping trips with our children tend to lead to over-purchasing due to pester power and those of us with young children prefer to over- rather than under-purchase, so we don't run out of provisions^{7, 11}.

Young families consistently report higher levels of wastage; almost half (47%) say they throw away food left on the plate after a meal compared with 32% of households in general. In addition, young families among us are more sensitive to food hygiene concerns and dates on labels; are more likely to say they ruin food in preparation; and much more likely to cite children's dislike of the food as a factor in wasting food⁶.

The same research found that 45% of young families with children under the age of 16 in the home are high food wasters and fussy

¹⁵ Harris International Marketing (HIM) quoted in IGD⁷

children are one of the major drivers of food waste; 22% of families give dissatisfaction by children with the taste of food as a reason for throwing it away. However, this should be set in the context of children's smaller portions and the economies of scale from cooking for families.

Are We Bothered?

None of us will ever engage with the issue of food waste and make the changes necessary to reduce it if we don't understand or acknowledge the problem. To date, the signs are that there is a long way to go before the majority of us are convinced that a problem exists, let alone of the need to address it.

As WRAP research shows⁶, we are split right down the middle on the question. Around half of us (49%) say that the issue of food waste *does* bother us, while the rest of us (51%) are less concerned or not at all concerned, although nine out of ten of us say we are not opposed to making an effort to reduce food waste per se.

There is also an issue of active engagement, revealed by the same study. Only around 13% of us appear to be receptive to, and actively engaged with, the issue of food waste. Around a quarter of us are receptive but passive, and a further quarter of us are not particularly receptive. That leaves around a third of us who are both unconcerned *and* resistant to change.

Most of us are either not aware of the problem of food waste or not interested. Of the people who are not bothered, many say they don't throw much away in any case, more than a quarter don't consider it a problem, 1 in 5 say 'it can't be avoided' and around the same number say they'd rather throw food away than risk food poisoning, particularly if there are children in the household; a small proportion (15%) say that they 'have other things to think about'.

Of those of us who are bothered, we are much more inclined to think of food waste as a concern, not because of its impact on the environment, but because of its impact on our pocket.

What's the True Cost?

The economic cost

In economic terms, the cost of food waste is high. Our most recent figures suggest each household throws away between £4.80 and £7.70 of food that could have been eaten each week, £250-£400 a year or £15,000-£24,000 in a lifetime³.

Not only have we paid for the food we also pay for its disposal, usually in landfill sites, through our council tax.

Whatever the true figure, there is no doubt that, for the more aware amongst us, cost is a factor. The people we interviewed who were already concerned about food waste cite three main reasons for their concern: it's a waste of money (68%); it's a waste of good food (45%); and it makes them feel guilty (36%). These factors prove to be remarkably consistent across the different socio-economic groups⁶.

In general, though, the research indicates that we do not think about the cost of food waste as often as might be expected – only 1 in 5 people interviewed (21%) said they thought 'a great deal' about the cost of uneaten food waste and 24% said they do not think about it at all.

Taken as a whole, we have become more affluent while food has become cheaper in real terms (accounting for just 10% of disposable income today, compared to 15% ten years ago although the percentages are higher for less affluent households⁷). The majority of grocery retailers continue to compete on price, so this situation is unlikely to change. In other words, as food loses economic value, we worry less about wasting it.

So, after over a decade of food deflation, the economic motivation to be careful with food, even for the less affluent households among us, has been eroded. Few of us today have experienced

food shortages, so the social and ethical pressures to avoid waste and extravagance are less relevant to our contemporary society.

Interestingly, it is the over-65s – many of them with memories of rationing during and immediately after the Second World War – who take most care to avoid wasting food¹¹. But as time passes, fewer people will have had this experience. This, combined with the economics of food supply, lead us to think that the sheer scale of the food waste problem will get worse if we don't tackle it now.

The environmental cost

Our research⁶ also explored environmental influences and found evidence of a lack of awareness and understanding of the environmental implications of food waste. We do not appear to have made the connection between the food we throw away and the environment.

Consumers simply do not recognise that greenhouse gas emissions are generated from the growing, transport, processing and storage of food before purchase and that, if food is thrown away, all this effort – and environmental impact – goes to waste too. We are much more sensitive to packaging waste than food waste, with almost three-quarters of us agreeing that 'discarded food packaging is a greater environmental issue than food thrown away'.

We need to ensure people are more aware of the cost to the environment and the contribution that food waste in landfill makes to the UK's greenhouse gas production. As it is, many people believe that food waste doesn't have *any* environmental impact at all, as it is 'natural' and 'biodegradable'.

From the same research one in seven (14%) of the people surveyed say they are making 'a great deal' of effort towards taking personal actions to address climate change and almost a

third (32%) claim to be making 'quite a lot' of effort. So if, as we hope, the environmental messages on food waste become clear to us and we take them on board, there seems to be a ready audience of us who are willing to listen and act.

The Role of Packaging and Technology

Packaging can play an important part in preserving food and helping consumers to manage their food better. Research conducted for WRAP¹⁶ surveyed existing packaging formats and technologies, looking at how offering basic packaging functionality, like being able to reseal a pack to protect the food inside, or offering consumers food in the right portion size can assist in reducing food waste in the home. The study looked at primary packaging initiatives, packaging and storage solutions for in-home use and packaging and retailer initiatives to raise consumer awareness of correct food storage.

Several pack formats and technologies were researched:

- resealing and re-closing packs, to create a barrier from the outside atmosphere;
- portioning packs that allow you to consume only what you want, leaving the remainder of the product sealed;
- materials and features (such as breathable materials and atmosphere control systems) that help prolong shelf life, even after pack opening; and
- smart label technology, such as time-temperature indicators (TTIs) that use chemical reactions to indicate food condition and storage temperature over time.

Consumers perceive packaging waste as a bigger problem than food waste. Retailers and brands introducing new packaging solutions to help reduce food waste are considering how to achieve this while using just the necessary amount of packaging.

A study into self-dispensing system¹⁴ underlines this consumer mistrust of packaging. Self-dispensing has the potential to give

¹⁶ Design Bridge (2006) *Market survey of packaging formats & technologies with food waste reduction potential* (report to WRAP; currently unpublished). See also Scott, B; Butler, P (2006) *Packaging Technologies with the Potential to Reduce the Amount of Food Thrown Away* (www.wrap.org.uk/downloads/Pckg_formats_food_waste_tech_18_Dec_MCB.2c3730ee.pdf)

more control over the quantities of food purchased and reduce packaging. Most people believe food is over-packaged, mentioning most often items like fruit and vegetables, frozen foods/ready meals, cakes and biscuits, and chilled goods. People already buy a substantial amount of loose food. More than 90% buy loose fruit or vegetables, and two-thirds buy bakery items and almost two-thirds (59%) of respondents say they would be reasonably interested in buying more loose food.

But there are also some reservations about self-dispensing. Consumers are concerned that self-dispensing may be unhygienic, messy and time-consuming, and that there may be no opportunity to give consumer information about the product. On the other hand, there is plenty that consumers like: you can serve yourself to as much or as little as you want, you can touch and smell the items, and loose goods are perceived as both cheaper and fresher.

So, self dispensing systems appear to have potential. To succeed as part of a waste reduction initiative, consumers have suggested that self-dispensing systems be appealing in terms of hygiene and appearance, give information about the product (nutritional information, brand of the product, best-before or sell-by date) and be easy to use.

Looking to the Future

Make my life easier

When a group of 890 grocery shoppers were asked what would make shopping better for them, they came up with a list of ideas¹⁷.

Most people found food shopping a tedious necessity and would rather delegate the job to someone else. Most were open to new ideas (73% came up with at least one innovation themselves) and reacted positively to new ideas presented to them – a fact confirmed by a later WRAP report on using Internet resources to help reduce food waste¹⁸.

Our lives are becoming more complex and time spent shopping is under pressure. What most of us want are ways of making it quicker and easier to shop, for example help with compiling shopping lists or planning meals, food management support, and smart labels to give date warnings.

Internet shopping

For some of us the Internet is regarded as a way to reclaim some of our time, as well as better organise our weekly food requirements.

At WRAP we commissioned a study¹⁸ to develop and test a portfolio of Internet, in-store and mobile phone-based consumer resources that were designed with food waste reduction in mind. A total of 20 options were tested with consumers. These included:

¹⁷ Institute of Grocery Distribution (2005) *Future Vision Report*

¹⁸ The Brewery (2006) *Internet site to reduce food waste* (report to WRAP; currently unpublished)

- using a mobile phone to browse lists and generate a personalised shopping list, which could then be sent direct to an online grocery retailer;
- using a mobile phone in the kitchen ('the cooking co-pilot') to receive recipe ideas and assist with the cooking process;
- in-store meal planning and recipe suggestions; and
- an on-line application that allows you to plan personalised meals on a weekly basis.

The most popular concepts were the most straightforward and non-intrusive and didn't require consumers to change their shopping methods too much. Of these, three stood out.

- 'reduced packaging' – this concept allows shoppers to choose a box of loose or minimally wrapped goods, contained in a simple cardboard box. This concept was found to have a definite 'feel good' factor;
- 'plan meals' – older respondents liked this idea, because it is a natural extension of existing habits and behaviour. It helps shoppers to plan meals from different lists depending on shopping occasions. They particularly liked the fact that it gave help with menu options and introduced variety into their diets. Younger consumers, who resist thinking ahead, weren't quite so keen on the concept as they tend not to plan meals ahead; and
- 'receipt recipe' – this is a simple idea in which online delivery receipts are used to carry useful information. This was seen to add value to the wasted space on the back of delivery receipts and was thought to be particularly useful for people who can't cook. It also had the advantage of being effortless on the consumer's part.

Rather than information through stand-alone portals or websites, it would seem from this study that consumers prefer much simpler solutions.

Next steps

This report shows the scale of the challenge we face in raising levels of public awareness and understanding when it comes to reducing food waste.

The most effective and persistent solutions to food waste must endeavour to improve everyone's understanding of the issues and encourage all of us to use our food more effectively. That's why at WRAP we strongly believe that the way forward is to create a positive climate around encouraging good behaviours in relation to food management. We all waste food and none of us think that's a good thing to do. Rather than trying to induce guilt or shame, we want to provide persuasive arguments for a change in behaviour together with simple but effective steps and tools that will help us manage our food better.

On the basis of our research we believe that some small changes could lead to much less food waste. We will develop our consumer campaign to draw on these results. We will also carry out further research to help explain the scale of the problem and then to highlight the simple straightforward steps each of us can do about it.

Annex 1

WRAP's Research Studies

The research studies commissioned by WRAP were designed to find out more about what food we waste, why we waste it and what can be done to change consumer attitudes and behaviour. These qualitative and quantitative studies include:

- *A quantitative assessment of the nature, scale and origin of post consumer food waste arising in Great Britain 2006*; survey of 2,939 householders into attitudes and behaviour relating to food purchasing, storage, consumption and disposal (Exodus Market Research).
- *WRAP food behaviour consumer research*; quantitative consumer research to explore household food behaviour, based on 1,862 interviews with GB households aged 16 and over (Brook Lyndhurst and ICM).
- *Understanding consumer food management behaviour*; qualitative research giving a summary of the findings of 10 focus groups, investigating attitudes to food purchasing and disposal, as well as storage and consumption (Ipsos MORI Social Research Institute).
- *Consumer research into self dispensing systems*; a study examining perceptions of self-dispensing systems (Marketry).
- *Market survey of packaging formats & technologies with food waste reduction potential*: research into the potential for packaging solutions to help consumers better manage their food (Design Bridge and PMT Ltd).
- *Internet site to reduce food waste*: a report on the role of internet resources in helping consumer waste less food (The Brewery).

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