

Final report

Consumer insight: date labels and storage guidance



Determining consumer understanding and use of date labels and storage guidance in order to reduce household food waste.

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Legacy research commissioned by the previous government.

Front cover photography: Close up of date marks on a pot of yoghurt taken as part of 'Helping consumers to reduce food waste – a retail survey' WRAP 2010b

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1.0 Introduction and methodology

1.1 Research aims

WRAP, the Food Standards Agency (FSA), representatives from the food industry, consumer groups and UK Government departments are working closely together to help reduce household food waste. One important element of this work is to improve consumer understanding and use of food date labels and storage guidance, as well as working with industry to ensure that this information is conveyed clearly and effectively to consumers.

This research, designed and delivered by Brook Lyndhurst, was commissioned by WRAP with the aim of strengthening the evidence base around consumer understanding and use of date labels and storage guidance, in order to understand the impact date labelling and storage guidance changes could have on reducing household food waste. By building up a detailed picture of how date labels and on-pack storage guidance are used by consumers in their decision-making around food, the objective was to provide a sound basis for progressing the programme of work being conducted by WRAP to:

- Improve consumer understanding and confidence in date labels and storage guidance.
- Clarify guidance to industry on the use of date labels and storage guidance.
- Enable changes to industry practice that will lead to greater consistency and simplification in the use of date labels and storage guidance.

1.2 Background: date label legislation¹

The aim of date mark labelling is to help consumers make safe and optimum use of food. The date mark is an indication by the manufacturer of the length of time a food can be kept under specified storage conditions.

The Food Labelling Directive (2000/13/EEC), implemented in the UK by the Food Labelling Regulations 1996 (SI 1996/1499), as amended, requires foods which are mandated by law to have a date mark to carry an appropriate durability indication, of which there are two types: a 'best before' date, which is the date up to and including which the food will be at its best quality, or a 'use by' date, which is for those foods which are highly perishable from a microbiological point of view **and** which are in consequence likely after a relatively short period to present a risk of food poisoning (and so relates to the safety of the food). Certain food products are exempt from the requirement to have a date mark.

In addition to the legally required date marks noted above, retailers may use other dates such as 'display until' dates², which aim to help shop staff with stock control. These have no legal basis and are not aimed at consumers to indicate when to eat the food but are used for commercial purposes only.

Legally, it is the responsibility of those originally labelling the food, namely the manufacturer, packer or EC seller, to set the appropriate durability indication or date mark, together with the storage instructions required to achieve that shelf-life.

Defra (in England) and the Food Standards Agency (remainder of the UK) are revising³ the current set of guidance notes⁴ on the date marking regulations. The aim of the updated guidance is to help all sectors of the food industry to understand and comply with the requirements of those regulations concerned with applying date marks on food packaging. It is designed to help food businesses provide date marking information in a way that complies with the law and is consistent, whilst helping consumers make safe use of food and cut down on food wastage.

1.3 Methodology and research design

The primary aim of this research was to enhance the existing knowledge base around consumer understanding and use of date labels and storage guidance in their food-related decision-making. Any research into consumer behaviour around food must be designed in acknowledgement of the complexities of this subject area. Food attitudes and behaviours are underpinned by an array of social-psychological drivers, many of which may not be observable, even to consumers themselves. It is therefore generally not sufficient to simply ask consumers about their behaviour, since recall and social desirability bias may compromise the validity of findings.

¹ "Date mark" is the legally recognised term: throughout this report, however, use is made of the more common "date label".

² Historically 'Sell by' dates have also been used for this purpose but less so now.

³ A public consultation was launched early last year. The consultation documents can be found at: <http://www.food.gov.uk/consultations/consulteng/2010/fsaguidanceappdatemarksfoodeng>

⁴ <http://archive.food.gov.uk/maff/pdf/usebyfin.pdf>

With these considerations in mind, this project employed a suite of tools and methods to approach the issues from various angles, in an attempt to 'triangulate' the evidence and ensure the validity of the findings. A central feature of the research design was the avoidance of direct questioning methods, in favour of approaches that used observation and elicitation to collect data. Table 1 summarises the research components, which were designed to complement one another with the aim of answering the following research questions:

- How are date labels and storage guidance understood, interpreted and used by consumers?
- What are the implications of this for household food waste?
- What impact could changes to labelling have on food waste?
- How could food date and storage information be made more valuable to consumers, with the aim of reducing food waste?
- What new ways of communicating with consumers could be developed to achieve this aim?

Table 1 Research components

Research element	Aims	Method	Outputs
Evidence review	To identify gaps in the existing evidence; to develop precise research questions for the subsequent phases of the project.	Evidence review of c. 60 items from the academic, grey, industry and marketing literatures.	<ul style="list-style-type: none"> • In depth literature review report; • Summary of key evidence – see section 2.
Baseline questionnaire	To gather background information relating to the behaviours and attitudes of kitchen diary participants towards food and food waste generally, and specifically around the use of date labels and storage guidance.	Paper questionnaire sent to kitchen diary participants, to be completed and returned prior to completion of kitchen diaries (174 returned).	<ul style="list-style-type: none"> • Baseline of kitchen diarist food attitudes, values and behaviours; • Cluster analysis, providing 'segmentation' of participant attitudes and behaviours around date labels and related themes – see section 3.
Kitchen diaries	To gather valid data on use of date labels and storage guidance, and their role in disposal decisions, at the point of decision-making.	Two week kitchen waste diary with 180 participants in three locations (urban, suburban and rural) (168 completed and suitable for analysis).	<ul style="list-style-type: none"> • Descriptive analysis of diary data along key themes; • Combination of diary data with baseline questionnaire data, to link waste outcomes to other attitudes and behaviours – see section 4.
Depth and telephone interviews	To develop a rich, qualitative picture of understanding, interpretation and use of date labels and storage guidance.	35 one-hour in-home depth interviews with selected kitchen diarists; 34 fifteen-minute telephone interviews with additional kitchen diarists.	<ul style="list-style-type: none"> • Thematic analysis of interview findings – see section 5.

Accompanied shops	To explore how date labels and storage guidance are used by consumers at the point of purchase, packing in the shop and unpacking at home.	Ten accompanied shops with a cross section of the public, conducted at a range of retailers.	<ul style="list-style-type: none"> • Thematic analysis of accompanied shop findings – see section 6.
Online survey	To test emerging patterns with a representative sample of the public; to gain insight into variation by product type and consumer group (e.g. age group, socio-economic group, household type); to test the impacts of label variations.	Online survey with representative sample of 2,000 members of the UK public, conducted in late August 2010.	<ul style="list-style-type: none"> • Analysis of results by product category, label type and consumer segment (including segmentation based on approach to date labels) – see section 7.

2.0 Background and context: a review of research to date

2.1 Introduction

This section presents a summary of the themes emerging from a review of the existing evidence relating to consumer understanding and application of date labels and storage guidance.

The aim of this phase of work was to conduct a thorough and critical examination of research to date, in order to identify gaps in the existing evidence and develop precise research questions for the subsequent phases of the project.

The evidence review covered over 60 items from a range of sources, including the academic and grey literatures (for example, work commissioned by the FSA, Defra and WRAP), industry studies (such as work conducted by the Food and Drink Federation and the IGD), marketing research and media reports (see section 2.7). A full bibliography can be found in section 9.

2.1.1 *The evidence landscape*

The existing evidence base consists of a relatively small number of in-depth studies that focus on consumer understanding and use of date labels and storage guidance, plus a long tail of evidence that touches on our topic of interest, without focusing explicitly on it. For example, a number of surveys on food labelling in general provide valuable snippets of information on date labels and the large body of academic evidence on food safety contains scattered references to use of date labels.

This summary of the evidence review draws out the key themes from the diversity of this evidence, including both the in-depth studies and the mosaic of 'snippets' that were located in the wider literature.

2.1.2 *The role of date labels in household food waste*

Date labels emerge consistently in the literature as an important factor in household food waste; for example:

- Kitchen diary research by WRAP (2008b) found the reason given by participants for a fifth of avoidable food waste (by weight) being thrown away was that food was 'out of date'.
- Brook Lyndhurst (2007a) reported that 34% of respondents in a nationally representative sample attributed food waste to food going past the date on the label.
- IGD (2007) found that 'past its 'use by' date' was the main reason given for throwing away food, mentioned (unprompted) by 33% of respondents.

These figures give an indication that date labels are a prominent factor in food disposal decisions, provide context for a deeper exploration of how date labels are interpreted and used, and outline the implications of this for household food waste.

2.2 Consumer understanding of date labels

Estimates about current levels of consumer understanding of different types of date labels vary widely, with some research finding high levels of understanding of date labels, while other studies suggest that confusion is widespread. Few data exist on how understanding has changed over time: the notable source, the Food Standards Agency's tracker survey (FSA 2009b, 2009c) provides ambiguous results, confounded by changes in question wording and changes in labelling practices over time.

'Use by' dates

- Several surveys found that around half of respondents correctly identify the 'use by' date as an indicator of food safety (e.g. FSA, 2009c; TNS, 2008; WRAP, 2008b).
- In one study, 83% of respondents correctly matched the statement "It is not safe to eat food after this date" with the 'use by' date (Brook Lyndhurst, 2008b).
- A different study (WRAP, 2010d) showed that, when asked what they would do with food that was a day past its 'use by' date, only 15% of respondents gave the correct⁵ answer – "It could be unsafe and should be thrown away". Forty-eight per cent selected "It depends on the food type" and 25% selected "The food could be unsafe to eat but they would test it / use their judgement".

'Best before' dates

- Survey data show that around half of respondents correctly identify the 'best before' date as an indicator of food quality (e.g. TNS, 2008).

⁵ We have used the phrase 'correct' as shorthand to refer to an answer that is in accordance with the legislation.

- One study showed that, when asked to define 'best before' dates unprompted, 65% correctly included a reference to product quality, although 27% of participants incorrectly included a reference to product safety (WRAP, 2008b).
- When asked what they would do with food a day past its 'best before' date, 19% correctly selected the answer "It's past its best but not necessarily unsafe to eat". Thirty-six per cent selected "The food could be unsafe to eat but I would test it / use my judgement" and 34% selected "It depends on the food type" (WRAP, 2010d).

The variation in these estimates suggests that question format and type can have a large influence on results – for example, the wording of the answer options, whether the question is prompted or unprompted, framing effects arising from other questions and methodology (online survey or face to face interviews) may all have an effect.

However, the key factor that seems to explain the largest swings is whether the question asks respondents for a 'technical' definition of the label or for their own personal 'working definition' of that label. For example, relatively high levels of correct responses around 'use by' dates (51%, 83%) plummet (to just 15%) when respondents are asked directly about their behaviour or *what they would actually do*. This suggests that there is not necessarily a relationship between correct understanding and correct usage: any links that do exist are likely to be complex and informed by other factors (FSA, 2009c; Brook Lyndhurst, 2007a).

Retailer guidance dates

There is some evidence that retailer stock control labels, such as 'display until' dates, may cause uncertainty or be misinterpreted by consumers (Brook Lyndhurst, 2008b; WRAP, 2010c; FSA, 2009c). Research into consumer understanding of retailer guidance dates again paints a mixed picture. One study suggests that, although 'display until' dates are understood correctly by the majority (81%), they are used by some consumers to judge food quality (20%) and safety (6%) (Brook Lyndhurst, 2008b). Other work finds that, when asked what they would do with food that was a day past its 'display until' date, 33% selected "The food could be unsafe to eat but I would test it / use my judgement", while 26% selected "It depends on the food type", 9% selected "The food could be unsafe to eat and should be thrown away". Only 13% selected the correct answer "It depends on the 'use by' date" (WRAP, 2010d).

As well as indicating confusion around the meaning of 'display until' dates, this again may point to differences in technical understanding and practical application of dates. It is also possible that a lack of confidence in their own judgement may lead some consumers to indiscriminately seek out date label information: the reported use of 'display until' dates to judge quality and safety suggests that some consumers do not distinguish between different types of food date. This suggestion is corroborated by the finding that many consumers (and the media, see section 2.7) tend to use 'catch-all' terms (such as 'sell by' date) to refer to all of the different types of food date (Brook Lyndhurst, 2008b).

WRAP's investigation of the extent to which date marks are used on products in-store (WRAP 2010b) found that there is inconsistent use of 'display until' dates, both among different products and between different retailers / brands. For some products – such as yoghurts, cheese and bacon – there is variation in the use of 'use by' and 'best before' date marks. Such variation and inconsistency may help to fuel the ambiguous consumer responses reported elsewhere in the evidence base.

Variation in the application of 'use by' and 'best before' dates by retailers and manufacturers (for example, on products such as cheddar cheese, yoghurts and bacon (WRAP, 2010b)) and the requirement for eggs to carry a 'best before' date, which should be treated as a 'use by' date, may well also be contributing to consumer confusion.

2.3 Consumer interpretation and use of date labels

2.3.1 The influence of product type on ability to judge risk

There is evidence that product type (rather than label type) is key in determining interpretation of date labels and resulting consumer action (Defra, 2009; Brook Lyndhurst, 2008b; Verbeke and Ward, 2006; Terpstra et al., 2005; Tsiros and Heilman, 2005).

The literature suggests that date labels are often used in conjunction with consumers' own judgement (Brook Lyndhurst, 2008b; WRAP, 2007c) and are relied upon to different degrees across different product categories (Verbeke and Ward, 2006; Terpstra et al., 2005; Tsiros and Heilman, 2005). Date labels are considered more

important for food where there is a perceived safety risk - for example, meat and dairy products (Terpstra et al., 2005) and are referred to most often for these products, both at home and in-store (WRAP, 2010c). Date labels are less important for bakery products, cereals, and fresh fruit and vegetables (FSA, 2009c; Brook Lyndhurst, 2008a).

Familiarity with a product is also a factor in the importance ascribed to date labels, since this affects people's confidence in their own ability to judge risk for themselves (Defra, 2009). Where people are more confident about a product, they often use the date as a 'yardstick', applying their own product-specific rules to come to a decision about whether it can be eaten (Defra, 2009; Brook Lyndhurst, 2008b).

There is some evidence to suggest that at the risk-averse end of the spectrum, people's product-specific rules of thumb sometimes include use of 'buffers' around dates. A small number of participants in one study, for example, claimed that they would throw some foods away one or two days *before* the date on the label (Brook Lyndhurst, 2008b).

2.3.2 Trust and confidence in date labels

The majority of consumers report feeling reasonably confident in their own understanding of date labels. WRAP (2010c) found that 96% of respondents feel "very" (37%) or "fairly" (59%) confident that they understand what the different food dates mean. The same study showed that 25% of people felt their understanding had improved over the last year and, for half of these, this was in part due to information from the media (see section 2.7 below for a summary of media reporting on this issue).

When consumers are asked about their level of trust in labels, the picture is ambiguous. On one hand, scepticism about date labels is relatively common – some question their reliability, are suspicious that they are a ploy to encourage people to buy more, or think they are there simply to protect retailers and producers against litigation (WRAP, 2007c; Sherlock and Labuza, 1992). At the same time, however, date labels are reported as being one of the most important pieces of information that consumers look for on food packaging (FSA, 2010; MAFF, 2000, cited in FSA, 2007).

2.3.3 Use of date labels in-store

The literature suggests that date labels are particularly valued by consumers when shopping. MORI (2004) found that 60% of respondents claimed to regularly look at date labels in-store and WRAP (2008a), similarly, found that 63% of respondents claimed to always read date labels when buying fresh fruit and vegetables.

On the other hand, when asked *unprompted* what information they look for on packaging while they shop, only 16% of respondents reported looking at date labels (TNS, 2008). However, this may be explained by the fact that much shopping behaviour is habitual and subconscious and, as such, consumers often find it difficult to recall what they looked at and how they made decisions in-store (FSA, 2010).

One study, based on observed rather than self-reported shopping behaviour (FSA, 2010), found that reference to and engagement with food labels in general was low but, within this context, date labels were a core piece of information referred to by consumers in-store.

2.3.4 Use of date labels at home

Again, evidence about use of date labels in the home is mixed. While some studies show that the majority of people claim to base food decisions at least in part on date labels (e.g. Brook Lyndhurst, 2008b), one study based on observational data concluded that:

"People use a minimal amount of food labelling in the home when preparing familiar or routine meals, using familiar ingredients or cooking methods. The information people say is important to them when buying food is not necessarily supported by what is actually in their cupboards, or how they actually use the information once in the home - particularly with regards to date labels" (FSA, 2010).

There does seem to be consensus, however, that where date labels are referred to, they are often used in conjunction with people's own judgement (Ramirez Research and Communications, 2009; Brook Lyndhurst, 2008b; WRAP, 2007c) and the extent to which they are relied upon differs by product type.

2.3.5 Other factors that influence interpretation of date labels

Other factors identified in the literature that may influence how date labels are interpreted and used include:

- For whom food is being made – people tend to be more cautious when feeding others, especially children (e.g. IGD, 2007; Brook Lyndhurst, 2007b).
- Desire for the 'freshest' food may lead some people to throw food away, despite understanding that it is still edible / in date (Brook Lyndhurst, 2008a; Brook Lyndhurst, 2007a).
- Being tempted by special offers on food approaching its date may lead to consumers making trade-offs between their 'normal' approach to date labels and achieving value for money (WRAP, 2007c; Theotokis et al., 2008).
- Much food behaviour is highly habitual and this may lead to date labels being consistently used incorrectly or ignored, or rules of thumb relating to one product being applied (incorrectly) to other products or across the board (Defra, 2009; FSA, 2010).
- Lack of confidence in ability to judge risk, perhaps linked to a lack of food management / preparation skills, may cause an over-reliance on, or over-cautious application of, date labels (Brook Lyndhurst, 2008b).

Overall, the literature suggests that date labels are one part of an array of food waste drivers. Date labels play a varying role for different people in different contexts. Evidence relating to the link between interpretation of date labels and food waste is mixed: research by Brook Lyndhurst (2007a) concluded that "sensitivity to date labels does not distinguish high food wasters from lows". On the other hand, research by WRc for WRAP (2010d)⁶ suggests a possible correlation between correct understanding of 'use by' dates and lower levels of food waste (although no relationship was found between correct understanding of 'best before' dates and lower food waste). In sum, more evidence is required to better understand the scale of the implications of date labels for household food waste.

2.4 Consumer understanding and use of storage guidance

There is very little evidence in the literature on consumer understanding and use of the storage guidance provided on food labels. Where research has been carried out specifically to explore consumer understanding of storage guidance, some uncertainty has been identified, for example respondents being aware that they should check their fridge temperature but not knowing how to check it (Brennan et al., 2006).

When asked in surveys, consumers often say that they would like more or clearer storage guidance – for example, 76% of participants in one telephone survey stated that they would find food packaging that provided clear instructions on how food should be stored to prolong its shelf-life "very" (46%) or "quite" (30%) useful (WRAP, 2007a). Some participants have stated they would prefer specific instructions about where to store products (e.g. in the fridge, in a cupboard), rather than just a generic 'Store in a cool dry place' (IGD, 2007). Qualitative research gives the impression that inconsistencies or exceptions to general storage rules (e.g. most, but not all, fruits should be kept in the fridge) can undermine consumers' faith in 'top level' guidance. Focus group participants responded most positively to advice which was tailored to specific products and when the benefits of the suggested storage method were explained (Brook Lyndhurst, 2008b).

A common misconception with regard to food storage appears to be around the role of packaging, especially for fruit and vegetables. Qualitative research has demonstrated that consumers are, at best, unaware that storing fruit and vegetables in their original packaging or the produce bags supplied for loose products, can lengthen their shelf-life and, at worst, are under the assumption that fruit and vegetables are better stored without any packaging (WRAP, 2008a; Brook Lyndhurst, 2008a; WRAP, 2007a).

2.4.1 Consumer storage behaviour

The literature identifies a variety of sub-optimal storage behaviours that seem to be widespread among consumers. Fruit, in particular, and vegetables, to a lesser extent, are often stored in ways that are likely to reduce their shelf-life (e.g. at room temperature rather than in the fridge; loose rather than in its packaging or wrapped up). Other product categories where poor storage has been identified are bakery products (which are sometimes stored in the fridge) and eggs (which are sometimes stored outside of the fridge) (WRAP, 2008b; Brook Lyndhurst, 2008b; WRAP, 2007a).

There is evidence that shelf-life expectations are influenced by food storage behaviour - those who store their fruit and vegetables in accordance with manufacturers' guidance appear to be more likely to think that these foods will last longer than those who store them otherwise (Brook Lyndhurst, 2008b). Similarly, those who,

⁶Preliminary study, in draft at the time of writing, to assess the use of multivariate statistical analysis in establishing correlations between self-reported attitudes, behaviours and levels of food waste (data from "The Food We Waste in Scotland, WRAP 2009")

after opening the products, store cheese and fresh meat in new wrapping in the fridge are more likely to think that these last longer than those who store them in the original packaging (WRAP, 2010a).

Survey respondents report keeping a lot of food for three or more days after opening it - 49% would take three or more days to eat bread after opening; 30% would take three or more days to eat cakes after opening; and 46% would take three or more days to eat sliced meats after opening. Exceptions were chilled, pre-prepared foods, meat and fish, which are most commonly eaten on the day of opening (WRAP, 2007b).

These behaviours need to be understood in the context not only of the broader suite of food-related behaviours that this present research explores, but also the information that is made available to consumers. WRAP's investigation of the storage information on products (WRAP, 2010b) showed that, whilst the vast majority of food products display some sort of storage guidance, there is considerable variation across that guidance. In particular, there is inconsistency when it comes to advice on how long products can be stored after opening, with chicken, ham, bacon, pasta sauces and cheese all found to have widely varying guidance. For example, four out of five packs (79%) recommended that ham should be eaten within two days of opening, but a substantial minority (15%) suggested that pack contents would be safe to eat three days after opening.

In 2008 Bird's Eye⁷ undertook research to understand behaviour around frozen food. It found that 85% of respondents significantly underestimated the length of time that frozen food could safely be stored for and half of UK households were estimated to throw away frozen food as a result of not using their freezers correctly. Sixty-six per cent of respondents believed that fresh food should be frozen as soon as it is bought.

Research undertaken by WRAP (2010f) found 92% of respondents said they regularly freeze fresh or refrigerated food at home. About half of respondents said they read the labelling on fresh/refrigerated foods to determine what can / can't be frozen and one in 20 look for the snowflake logo. However, when the whole survey population were shown the snowflake logo only half (54%) recognised it as meaning the item is suitable for freezing. When asked when they would freeze fresh / refrigerated food, the top two answers were 'on the day of purchase' (59%) and 'as soon as possible after they're bought' (25%). About half the sample stated that they got their information about 'how long to keep their frozen foods for', by reading pack instructions.

Again, it is interesting to understand these behaviours in the context of the information provided on-pack. WRAP's research (2010b) found that where freezing guidance was given, the majority of packs would use the snowflake logo and state 'freeze on day of purchase'. Despite this apparent consistency, guidance on certain products was varied e.g. 10% of bacon packs gave no freezing instructions, 50% had the snowflake logo and 2% specifically advised not to freeze. No packs of cheddar cheese suggested they were suitable for freezing, even though grated cheese can be frozen and 11% of packs of mainstream bread and 38% of packs of rolls were found to have no freezing instructions (these figures include in-store bakery as well as wrapped bread). It is encouraging that 32% of cooking sauce packs had freezing instructions, with 73% of these suggesting that the sauce be frozen in a suitable container. Similar advice was found on 24% of milk packs.

It was also found that advice on when the product could be frozen varied e.g. 79% of packs of mainstream bread stated the pack should be frozen on the day of purchase, 18% to freeze as soon as possible. For bread rolls, a similar situation was found (87% and 5% respectively).

Once frozen, advice on how long the product could be kept in the freezer also varied e.g. 77% of packs of world bread suggested one month and 6% three months. For mainstream bread, a similar situation was found (28% and 43% respectively) and for bacon (85% and 7% respectively). It is also interesting to note the number of products that apparently gave no advice on how long the product could be kept in the freezer e.g. 24% of chicken packs gave no advice on when to freeze or how long to keep the product for.

2.4.2 Monitoring fridge temperature

Keeping refrigerated food⁸ cold (typically between 0°C and 5°C) is important to ensure the safety and quality of the food up to the end of its stated shelf life. The way manufacturers communicate this information to

⁷ Omnibus survey undertaken by Bird's Eye, 2008, selected charts available at:
http://www.wrap.org.uk/downloads/FSA_040209_EVENT_-_ADP_afternoon.6adfe8e6.7217.pdf

⁸ 'Refrigerated food' is used in this report to refer to all foods that are designed to be kept refrigerated for reasons related to safety or quality, plus any foods that benefit from being kept refrigerated (such as fresh fruit that retains its quality for longer if kept refrigerated).

consumers has, however, been found to vary (WRAP, 2010b) from, for example, a general instruction to 'keep refrigerated' to 'store below 5°C' or 'store at 0-5°C'.

The literature suggests that somewhere between 40% and 80% of people monitor their fridge temperature (FSA, 2009c; WRAP, 2007a). Some research suggests that consumers who are unaware of what the correct fridge temperature is may be keeping their fridges at temperatures that are too high, while assuming that they are set appropriately (WRAP, 2006a; WRAP, 2006b; Donkin et al, 1998). More recent work has found that around 80% of respondents know at what temperature their fridge should operate but just a fifth had some method actually to measure the temperature. The majority instead rely on 'feeling' the food to see if it is cold enough (WRAP, 2010a).

2.4.3 In-store and in-home use of storage guidance

The evidence suggests that only a very small proportion of consumers pay attention to storage instructions when shopping for food (FSA, 2010; TNS, 2008). For example, one survey (TNS, 2008) found that of the 2,132 respondents who claimed to look at food labelling when buying a food product for the first time, only 6% mentioned looking for cooking and / or storage instructions unprompted (although this may be subject to the caveat mentioned above that consumers often cannot remember what they have looked at in-store).

However, although it seems that consumers do not tend to look at storage guidance on foods in-store, they do claim to take the food's shelf-life and in-home storage requirements into consideration while shopping by, for example, looking for re-closable packaging (WRAP, 2007a).

In terms of home use of storage guidance, the picture is mixed. Although a large majority of consumers claim to read and follow food storage guidance at home at least part of the time (WRAP, 2010a; WRAP, 2008b), when asked unprompted why they store foods the way they do, on-pack storage guidance barely makes an appearance (Brook Lyndhurst, 2008b).

2.4.4 'Use within x days of opening' guidance

Observational research suggests that consumers pay little, if any, attention to guidance that instructs them to eat foods within a certain number of days of opening (FSA, 2010). This may be linked to the suggestion that consumers often forget when the food in their fridges or cupboards were opened (IGD, 2007; Brook Lyndhurst, 2007b). Other research shows that the extent to which consumers claim to follow this type of guidance appears to vary between food types, with the advice most likely to be followed for fresh meat and fish and least likely to be followed for cheese and cooking sauces (WRAP, 2010a).

2.4.5 Other drivers of storage behaviours

A number of other drivers of storage behaviours are identified in the literature:

- The force of habit appears to be a key influence on consumers' food storage behaviour. Habits are picked up from parents or partners and then rarely thought about (FSA, 2010; Brook Lyndhurst, 2008b; Brennan et al., 2006).
- There is also some evidence that social norms may drive some food storage behaviours – in particular the social norm of having a fruit bowl, either as a 'reminder' to eat fruit or on display for visitors (Brook Lyndhurst, 2008a).
- The existence of mixed messages (for example, fruit and eggs stored at ambient temperature in-store, but with on-pack advice to refrigerate) is identified as a source of uncertainty for some consumers (Defra, 2009).

In terms of the link between understanding and behaviour, some of the research that was reviewed suggests that knowledge of appropriate storage methods does not always lead to appropriate storage behaviour. Consumers may be aware of the best storage methods but still choose to store their food in a different way for other reasons (such as 'fruit bowl' social norms) (Brook Lyndhurst, 2008a; Terpstra et al., 2005).

2.5 Interactions between date labels and storage guidance

Date labels on food are valid indicators of food safety or quality only if food is stored according to manufacturers' guidance. The evidence review therefore covered research into whether consumers are aware of this dependency and whether food labelling enhances or obstructs understanding.

There is very little evidence in this area and the bulk of research focuses on interactions between date labels and freezing decisions. In one study, 70% of respondents claimed to refer to date labels when deciding whether or not to freeze foods (Brook Lyndhurst, 2008b). One study from Greece suggests that when

consumers purchase food with the specific intention of freezing it, they are less likely to check date labels while in the store (Theotokis et al., 2008).

Observational research by Ipsos MORI (FSA, 2010) (15 ethnographic meals) found that many participants did not understand the meaning of the date label once they had frozen fresh or refrigerated food at home or for store-bought frozen food. They said they would throw away food from their freezer if it had past its 'use by' date despite it having been frozen within the date.

Where date labels are used in freezing decisions, it seems that they are used in much the same way as they are used in disposal decisions – for example, if consumers do not distinguish between 'use by' and 'best before' dates when deciding whether food is good to eat, they are unlikely to do so when / if they use dates for freezing decisions (Brook Lyndhurst, 2008b). There is also some evidence that some consumers want to leave a 'buffer' before the date on the label when freezing food and would hesitate to freeze food that was approaching its date (Brook Lyndhurst, 2008b).

2.6 Potential technical solutions

2.6.1 *Time-temperature indicators*

Time-temperature indicators (TTIs) have been suggested as a potential alternative to date labelling to clarify the confusion that currently seems to surround these labels. Proponents claim that TTIs have the potential to reduce consumer food waste (Sahin et al., 2007).

Very little research into consumer responses to TTIs is available and the evidence that does exist suffers from a lack of detail on research methods and small and / or unrepresentative samples. The findings of the existing studies are also contradictory: in some surveys consumers suggest such technologies, unprompted, as potential means of reducing food waste (IGD, 2007) or express positive attitudes when questioned (Sherlock and Labuza, 1992), while other research has uncovered more negative reactions (WRAP, 2006a).

2.6.2 *Longer shelf-life foods*

Research exploring consumer responses to foods with a longer shelf-life has identified a divide between two groups of consumers: some claim that they would be happy to pay extra for such foods, while others would not be interested in buying them at all, mainly due to concerns about preservatives, as well as a perceived higher cost for the food. Longer shelf lives seem more acceptable for some food types than others – there was most interest in pre-prepared salads that lasted longer and least interest in having a longer shelf-life for fresh meat and fish (WRAP, 2007a).

2.6.3 *Re-closable packaging*

A WRAP survey asked respondents how they thought food packaging could be improved to keep food fresher for longer and the most common response was "better re-sealing methods" (suggested by 42% of those who responded) (WRAP, 2007a).

2.7 Media reporting of date label issues

A key source of information for consumers about date labels is the media, where there are periodic spikes of interest in the issue. A lot of attention has focused on consumer confusion surrounding date labels. Media support for remedial action in the guise of date label standardisation is strong (e.g. The Independent, 28 January 2010; Telegraph, 12 July, 2010; The Times, 11 August, 2009). However, media reports frequently confuse the different date labels, and what changes are possible (under EU and UK law) or are being requested of industry.

Similarly, there is evidence that the media (to a similar extent as consumers) fail to distinguish correctly between different dates. For example, 'sell-by' dates are commonly referred to and used as a catch-all term despite having been virtually phased out by industry (e.g. Times, 11 August 2009; Daily Mail, 12 July 2010). The Daily Mail (12 July 2010) reported that the bread manufacturer Warburtons had removed the 'use by' date from their product, when in fact it was the 'display until' date that was removed.

Various news articles in July 2010 wrongly reported an impending 'overhaul' of the date label system, stating (erroneously) that all labels would be replaced by a "simple 'use by' guide" (Telegraph, 12 July 2010) or a "simple 'use before' date" (Daily Mail, 12 July 2010). Both articles failed to acknowledge that both 'use by' and 'best before' dates are legally required for most foods.

Since the media is known to be a source of information for consumers about date labels (WRAP, 2010c), this widespread confusion and mis-reporting is likely to be contributing to general consumer uncertainty. In addition, the suggestion that date labels are a cynical marketing ploy by retailers (e.g. Mail Online, 14 August 2009) may also undermine consumer confidence and trust in date labels.

2.8 Implications for food waste

The review of the literature suggests that, while the majority of consumers tend to use date labels to some extent in their food decision-making, a minority (9% - WRAP, 2010c) claim to never refer to dates. At the other end of the scale, a minority places heavy reliance on date labels to decide whether food is good to eat:

- While 46% say they “often eat food after the ‘sell by’ date”, 25% say they “never eat food after the ‘sell by’ date” (Mintel, 2010).
- 26% say they would not eat food dated yesterday (Brook Lyndhurst, 2008b).
- 10% claim they would throw food away if it passed its ‘best before’ date (WRAP, 2010c).
- 9% claim that they would throw food away if it passed its ‘display until’ date (WRAP, 2010c).

Although it is difficult to estimate the extent of these different behaviours from these varying figures, the overall pattern suggests that date label behaviour may be thought of as a spectrum: at one end are consumers who ignore dates altogether and at the other are those who rely on dates almost entirely. Between these two extremes sit the majority of consumers, who use dates to differing extents in their food management and disposal decisions. The implications of date label usage for food waste are therefore polarised: there would appear to be some people disposing of food prematurely as a result of date labels, while others are making food disposal decisions without reference to date labels.

It is similarly difficult to estimate how much inappropriate storage methods contribute to food waste overall. Given the sub-optimal storage practices identified in some research, there does seem to be scope for improvement in general storage habits and behaviours. However, storage *guidance* does not currently seem to play a prominent role in most people’s storage *choices*, and most consumers do not seem to value existing storage guidance very highly or use it very often. Perhaps more importantly, most consumers do not acknowledge the waste implications of poor storage (Brook Lyndhurst, 2007a). WRAP research (2010a) found that 16% of respondents did not think that their fridge temperature made a difference to how long their food would last.

An analysis of food waste and kitchen diary responses (WRAP, 2009c) estimated that every year in the UK at least 450,000 tonnes of food is thrown away because it has passed a ‘best before’ date, but if stored in accordance with manufacturers’ guidance food should be perfectly safe to eat up to and after this date (‘best before’ being a guide of food quality and not safety). In addition, at least 380,000 tonnes of food is thrown away because it has passed a ‘use by’ date, but this waste could have been avoided through checking the date and either cooking or freezing before the end of the ‘use by’ date. A further 255,000 tonnes of food is also thrown away before it has even reached its ‘use by’ or ‘best before’ date, and the research suggests that much of this could have been avoided if the food had been stored in accordance with guidance and/or through consumers having greater confidence in date labels.

2.9 Summary

The evidence presents a somewhat patchy picture and there are significant gaps. Although there is overall consensus that uncertainty around date labels exists, the extent of the problem and its implications for food behaviours and household food waste remain unclear. In addition, there is very little research into consumer understanding and use of storage guidance and the interactions and dependencies between correct interpretation of date labels and storage guidance.

Within the evidence that does exist, the large variation in results from different studies raises questions about the validity and reliability of findings. A fundamental problem seems to be that most food behaviours are highly habitual and often take place at the ‘pre-conscious’ level. Evidence suggests that consumers rely heavily on heuristics and experience (or habit) to guide them while shopping. Similarly, food management behaviours in the home are complex and informed by an array of social and psychological drivers, many of which may not be clear even to research participants themselves. This makes it difficult for people to recall certain aspects of their food behaviours and decision-making and means that findings based on self-reporting may not give an accurate picture.

This issue may help to explain the disproportionate effect that research tools – question format, survey type and so on – can have on responses. Almost all methodologies would be subject to the limitation that studying behaviours can artificially focus attention on the behaviour in a way that would not normally happen. Therefore, the greatest challenge in researching consumer understanding and use of date labels is to minimise this effect by devising techniques that, rather than relying on direct questioning and self-reporting, find ways to indirectly elicit information and observe the behaviours in question.

3.0 Findings of the baseline questionnaire

3.1 Introduction

The baseline questionnaire, which can be found in appendix 2, was arranged into three sections:

- Planning and shopping.
- Preparation and cooking.
- Attitudes and values.

The questionnaire was sent out to the 180 kitchen diary participants, and 174 were returned. Questionnaires were completed and returned before the kitchen diary exercise began so that responses were not distorted by completion of the diary.

Participants were recruited for the food waste diary based on the full recruitment specification found in appendix 1. The sample was selected purposively on the basis of certain characteristics, such as taking the main or a central role in shopping or cooking for their household. Within this, quotas were set for other background characteristics, such as age, social group and household type, to ensure that a good spread of people was represented. Participants were drawn from three locations – Somerset, Coventry, and Nottingham – in order to include rural, suburban and urban participants.

The objective of the baseline questionnaire was to gather background information relating to the behaviours and attitudes of our diary participants towards food and food waste generally and specifically around the use of date labels and storage guidance. A wide selection of questions about food was included in order to avoid priming participants to the issue of date labels and storage guidance prior to the diary exercise. The resulting baseline data enabled us to fulfil the following aims:

- To gain a greater appreciation of how, why and when our diary participants understand, interpret and use date labels and storage guidance.
- To build a holistic picture of the place of date labels and storage guidance as decision-making tools along the food journey, from shopping to disposal, by placing them in a wider context of other food behaviours, values and attitudes.
- To explore the nature of this decision-making framework, identifying links between how date labels or storage guidance are used and interpreted, and other behaviours and attitudes.
- To group and compare the food diary entries of participants with reference to their reported use of date labels, storage guidance and other behaviours and attitudes, thereby exploring the links between application of date labels and storage guidance and household food waste.

The first three of these aims are addressed within this section, while the fourth is explored in section 4, which specifically examines the kitchen waste diaries.

3.2 Topline findings

The topline findings from the baseline questionnaire are summarised here under four headings:

- Shopping habits - based around buying and shopping behaviours.
- Kitchen habits - behaviours in the home.
- Values and attitudes – both generally and specifically with respect to food.
- Understanding of date labels.

These headings cover a selection of question responses which were particularly relevant to our research questions and to date labels and storage guidance specifically, *not* every question in our baseline questionnaire. A much wider range of questions are, however, investigated in detail as part of the 'cluster analysis' found in sections 3.3 and 3.4.

3.2.1 Shopping habits

More than three quarters of questionnaire respondents reported that, when food shopping, they choose the product with the longest date *always* or *most of the time*, while less than half (41%) claimed to check the pack for how food should be stored at home. This suggests that, in the shop at least, date labels are given more attention than storage guidance.

However, when asked to rate the importance of different factors in choosing what food to buy, '*how long until it goes off*' was rated lower than freshness, taste, quality and price. This suggests that the desire to buy products with the longest date may be more about buying the freshest or best quality product than a tool for planning.

Just over half (56%) said they check what they already have at home before going shopping and just under half take a list *always* or *most of the time* (of whom 80% use it only as a guide)⁹.

3.2.2 Kitchen habits

The reported use of date labels in the home is relatively high: 78% reported that they keep an eye on food dates *always* or *most of the time*.

Reported use of storage guidance is even higher than for date labels – 82% claimed to 'Make sure they follow storage instructions on food packaging' *always* or *most of the time*. However, this finding was not backed up by the qualitative elements of our research (the depth and telephone interviews – see section 5) in which a large proportion asserted that they rarely look at storage guidance.

Respondents were also questioned separately about guidance on *where* to store food and *how long* to store food for. A large majority (nearly 80%) reported using guidance on food packaging for *where* to store food *always* or *most of the time*, while a lower 65% claimed to use guidance on *how long* to keep food that has been opened but not finished *always* or *most of the time*.

However, again these findings are not consistent with the depth interviews, in which participants reported paying more attention to storage guidance about *how long* than about *where* to store food products, if using storage guidance at all; most generally felt that they just used their 'common sense' to decide.

3.2.3 Values and attitudes

A majority claimed to be worried about food waste: 62% said that throwing food away bothers them *a great deal* or *a fair amount*, while 71% said that they make *a great deal* or *a fair amount* of effort to minimise their household food waste.

A significant minority do not believe that they would find it challenging to reduce their food waste: 40% disagreed that '*It would be difficult for me/my household to reduce the amount of food we throw away*'. A large majority also appear open to suggestions of how to minimise their household food waste: 73% disagreed that '*Nothing would encourage me / my household to try and throw less food away*'.

The study also sought to gauge the level of interest or anxiety among respondents towards food safety and quality issues, particularly as these are what 'use by' and 'best before' labels are intended to indicate. It was found that 57% *strongly agree* and 27% *tend to agree* that they '*Would rather throw food away than risk food poisoning*', while 33% *strongly agree* and another 33% *tend to agree* that they '*Would rather throw food away than eat it when it's past its best*'.

The fact that two thirds *strongly* or *tended to agree* with the latter statement may have implications for the way in which participants might approach or interpret a 'best before' label even when they are aware of its correct definition.

3.2.4 Understanding of date labels

As was found in the literature review (see section 2), numerous studies have tried to deduce understanding of different date labels through direct questions within a survey. However, the wording of the question and response options appeared to have a significant effect upon responses. A general limitation of the questionnaire or survey approach is that direct questioning may artificially focus people's attention on something which is usually subconscious, leading to distorted results. In addition, this approach may not capture the distinction between technical definitions of date labels and the working understanding that most people appear to have developed.

In acknowledgement of these difficulties and of the complex ranges of understanding and interpretation in this area, this study approached the matter slightly differently in the questionnaire. Participants were given an open box in which to respond to the question "*What do the date labels on food packaging tell you?*" While still, and unavoidably, focusing their attention on the matter, this steered clear of giving respondents cues about what to include (e.g. by not naming any actual dates or providing them with technical definitions to choose between), instead giving them a space in which to report only their 'front of mind' interpretations.

⁹ These figures for planning and taking a list are similar to, but slightly lower than, those found by WRAP's Household Food Waste Prevention tracking survey wave 8, WRAP (2010).

Of the 170 responses to this question, 107 (62%) gave a generic definition which did not distinguish between different types of date label. Within these 'generic' definitions there was significant variation - the most common type was use of date labels as a blanket 'use / eat-by' style rule, followed by generic definitions relating to the life span of the product, about freshness or quality and treating dates as a guideline:

That the food should not be eaten past that date.

[FEMALE, 36, E, BRISTOL]

I tend to use the date as a guideline and will eat some foods past that date apart from meat, eggs etc.

[FEMALE, 27, C1, NOTTINGHAM]

In this unprompted setting, 23 respondents (14%) named and defined 'best before' dates correctly (where a "correct" response implies respondents either associated 'best before' dates with quality, or referred to using them as a guideline only), while 25 (15%) named and defined 'use by' dates correctly (where a "correct" response implies respondents either associated 'use by' with safety or gave a strict interpretation of using the date).

Although the 'open question' approach brings its own hazards (e.g. some respondents may simply have been perplexed by the question) the most striking result from this exercise was the range of and variation in the 'front of mind' answers that were given. Many of the responses tied up a more technical definition with personal rules and judgements, for example:

I look at the date labels on food, especially on meat, when doing the big weekly shop. I would not buy food near its sell by¹⁰ date. I don't tend to look at the date label on fresh fruit and veg, as you can tell by the look and feel of it whether it is near its sell by date. I would use fruit or veg past its sell by date in my fridge if it looked ok. But not for meat. I would throw meat away past its sell by date, even if it looked ok.

[FEMALE, 32, B, COVENTRY]

I use the dates on packaging as a very strong guideline when to use the product. I will sometimes go over the use by date by a couple of days unless I feel the product is not fit to eat, i.e. smell and colour.

[FEMALE, 63, C2, COVENTRY]

In summary, there seemed to be very little shared understanding of date labels across the sample, with participants often reporting highly personalised and idiosyncratic practices around their interpretation and use of date labels. This raises questions about the interface between 'technical' understanding and 'practical' interpretation of date labels, and the links between understanding, behaviour and food waste. The next section lays the foundation for further exploration of these questions, by beginning to explore some of the patterns of attitudes and behaviours that may help us to explain the use of date labels and the implications of this for food waste.

3.3 Further exploration of the questionnaire: cluster analysis

While the topline results were useful in providing a broad picture, it is the links between different areas of the questionnaire which could indicate how, and whether, different behaviours and attitudes around food and food waste are linked.

In this section those links are explored using a cluster analysis through which participants have been grouped according to similar reported behaviours and attitudes. The extent to which those behaviours and attitudes were related to demographics and other areas of the questionnaire was then explored.

3.3.1 What is cluster analysis and why was it used here?

Cluster analysis is a group of statistical techniques through which a set of observations (in this case questionnaire respondents) are grouped into subsets, called clusters, which share similar characteristics.

¹⁰ Phrases such as 'sell by' and 'use by', which appear inside quotation marks in the main body of the text, are not presented inside quotation within verbatim quotations from respondents, unless the respondent themselves used the quote marks.

Cluster analysis was used in this study on an exploratory basis. The objective was to see if it was possible to group or categorise questionnaire respondents in terms of the links between date label and storage guidance behaviours, on the one hand, and wider sets of behaviours and attitudes around food on the other. The aim was to find out whether certain patterns of food behaviour could influence or be influenced by:

- Social demographics and characteristics.
- Responses to other parts of the questionnaire.
- Other patterns of behaviours in the cluster analysis.
- Behaviours seen in the kitchen diaries, such as the volume of and motivations for food waste (as addressed in section 4).

It is important to stress the exploratory nature of this element of the study. The sample size for this cluster analysis was not large, and the structure of the sample was not representative of the population. As a consequence, it is not appropriate to give undue weight to the results. The findings, though indicative only, are nevertheless both interesting and useful, as the sections below show.

3.3.2 How was the clustering done?

Cluster analysis was performed on five different groups of questions, based on the research questions and themes, which were identified from the literature review as having an impact on date label and storage guidance behaviour. The five themes were:

- Reported date label behaviours.
- Reported storage guidance behaviours.
- Attitudes to food risk.
- Food management behaviours¹¹.
- Shopping and stock management behaviours.

An analysis of the whole sample was conducted for each of the five themes, so that each participant would be assigned to a 'cluster group' within each theme on the basis of their responses to a finite set of questions. It was then possible to see which respondents were in a given cluster group and how they answered the questions included. It should be noted that all clusters were based on self-reported behaviours or attitudes.

The statistical techniques used merely identify 'Cluster 1', 'Cluster 2', 'Cluster 3' etc. For the purposes of presentation, and on the basis of the broad characteristics of the various clusters, names have been assigned to the clusters. A summary of the clusters which emerged can be seen in Table 2 below.

In the sub-sections that follow, each of the clusters is described in more detail, alongside any interesting findings or patterns which emerged from cross-tabulating sets of attitudes and behaviours with background characteristics (e.g. socio-demographics) and with other questions in the questionnaire.

In each case this helps to build up a picture of the ways in which different attitudes and behaviours cluster together and to suggest possible links between these attitude/behaviour sets and others.

¹¹ This particular cluster is based on questions on kitchen behaviours which related to making use of foods already in the home including leftovers and food past its best.

Table 2 Summary of cluster analysis

Cluster Theme	Cluster Names and Summaries
Reported date label behaviours	<p>Cluster 1: Date driven [39%] In general, this group are very focused on date labels – they always look for the longest date label available in the shop and keep an eye on date labels at home.</p> <p>Cluster 2: Date 'savvy' [48%] These participants keep an eye on dates at home or shop for longer dates <i>at times</i> but less consistently than the first group.</p> <p>Cluster 3: Date disengaged [13%] These participants show very little interest in date labels, tending not to use them in the shop or at home for food management decisions.</p>
Reported storage guidance behaviours	<p>Cluster 1: Storage guidance 'agnostic' [48%] This group have a mixed set of behaviours around storage guidance – they generally claim to use it some of the time, but their behaviours are mixed and they are not always relying on it.</p> <p>Cluster 2: Storage guidance aware [52%] These participants claim to use or follow various forms of storage guidance <i>all or most of the time</i>. This does not necessarily mean they make every decision by referring to the packaging, but may apply storage guidance they have read at some point to <i>similar types</i> of food products.</p>
Attitudes to Food Risk	<p>Cluster 1: Confident judges [42%] This group seem to be more confident about food safety and reheating food and are more willing to try eating food, which is not necessarily at its best.</p> <p>Cluster 2: Safety sensitive [58%] This group are very risk averse and are generally unwilling to attempt to eat food they perceive as potentially unsafe or even simply not top quality.</p>
Food Management Behaviours	<p>Cluster 1: Leftover leavers [34%] This smaller group generally claim to <i>rarely</i> or <i>never</i> engage in cooking and kitchen activities which would make use of food towards the end of its shelf-life.</p> <p>Cluster 2: Fridge foragers [66%] This majority group of participants claim to use leftovers, use up food near or past its best and freeze food at least some of the time.</p>
Shopping and Stock Management Behaviour	<p>Cluster 1: Cupboard monitors / list makers [65%] This larger cluster generally claims to pre-plan their shopping, check what they have at home and take a list with them <i>most of the time</i>. They are not planning obsessively but are generally aware of what they have and need to buy.</p> <p>Cluster 2: Spontaneous shoppers [35%] This smaller cluster plan what they are going to buy <i>sometimes</i> or <i>rarely</i>, do not often take a list and will only check what is in their cupboards before they go shopping <i>some of the time</i>. They appear much less interested in buying just what they need.</p>

3.3.3 Reported date labels behaviour theme

The three clusters which emerged represent two extremes and a middle group (Table 3). The first cluster, the 'date driven', claim to stick very strictly to dates at all times while, at the other extreme, the 'date disengaged' claim to mostly ignore them. The middle group are 'date savvy' – those who pay some attention to date labels but on a less consistent basis.

Table 3 Reported date labels behaviours theme summary

Questions Included [<i>in order of importance in determining the cluster</i>]:	3 clusters were created, looking at the reported behaviours of respondents towards dates <i>in the shop</i> and as a form of <i>stock monitoring</i> ¹² .
Q6 – How important are each of the following when you are choosing what food to buy? <i>How long until it goes off</i>	Cluster 1: Date driven [39%] In general, will always look for the longest date label available in the shop, and keep an eye on date labels at home.
Q9 – When food shopping, how often do you choose the product with the longest food date?	Cluster 2: Date savvy [48%] These participants claim to keep an eye on dates and shop for long dates <i>at times</i> but are less extreme than the first group.
Q12 – How often do you keep an eye on food dates so you know what needs eating when?	Cluster 3: Date disengaged [13%] These participants show very little interest in date labels, tending not to use them in the shop or in management.

Background characteristics

Initial analysis compared the date label behaviours' clusters by the background and demographic aspects of those within them. The main and most surprising finding across the board was that demographics appear to have very little impact on the approach a participant takes to date labels:

- Household composition had no noticeable influence on use of date labels.
- Age appeared to have a limited influence on date label behaviour, with a slightly higher tendency for 60+ to be 'date driven'.
- Some weak patterns around social segment suggested ABs may be slightly less likely to be 'date driven' and DEs are slightly *more* likely.

Links to other attitudes and behaviours

When these comparisons were conducted across the range of behaviours and attitudes in the baseline questionnaire it was found that:

- Those who claim to buy British and 'free range' products frequently appear more likely to be 'date driven' and less likely to be 'date savvy', suggesting that those who pay the most attention to date labels may also be more engaged with other food labels.
- The 'date savvy' were most likely to say that they waste *quite a lot* or *a reasonable amount* and least likely to be bothered by it, while the 'date disengaged' were the least likely to say they waste *quite a lot* or *a reasonable amount* and the *most* likely to express concern about it. However, none of the clusters reported putting in significantly more or less effort to minimise or avoid their food waste.
- The 'date driven' group were more likely than the others to think that reducing their food waste will be difficult, while the 'date savvy' are less likely to think so. This suggests the 'date driven' group would struggle more to reduce their waste because they are already monitoring when their food is in date.

¹² It should be noted that the cluster questions are not about the use of date labels in decision-making at the point of disposal – i.e. it is not about individual interpretations of date labels, but their general awareness of them. Point of disposal behaviours were considered in the kitchen waste diaries, and are explored in section 4.

3.3.4 Reported storage guidance behaviour theme

Two clusters emerged of roughly equal size (Table 4) The 'storage guidance aware' were the more extreme or well-defined of the two groups, while the 'storage guidance agnostic' are more of a mixed picture, using some types of guidance in some situations.

Table 4 Reported storage guidance behaviours theme summary

Questions Included [<i>in order of importance in determining the cluster</i>]	2 clusters were created, by looking at how often participants claimed to use storage and usage guidance on food packaging, to follow it at home, and to look at it in the shop.
Q13 – To what extent do you: use guidance on food packaging to tell you how long to keep food that you have opened but not finished (e.g. 'Once opened, use within 3 days')?	<p>Cluster 1: Guidance agnostic [48%] This group have a mixed set of behaviours around storage guidance – they generally claim to use it some of the time, but their behaviours are mixed and they are not always relying on it.</p> <p>Cluster 2: Storage guidance aware [52%] These participants claim to use or follow various forms of storage guidance <i>all or most of the time</i>. This does not necessarily mean they make every decision by referring to the packaging, but may apply storage guidance they have read at some point to <i>similar types</i> of food products.</p>
Q13 – To what extent do you: use guidance on food packaging to tell you where to store food (e.g. in the fridge, freezer, a cool dark place)?	
Q13 – To what extent do you: make sure you follow storage instructions on food packaging?	

Background characteristics

Comparisons of the demographics and background characteristics of different clusters in the reported storage guidance behaviours theme found that:

- Those in social groups D and E were much less likely to be in the 'guidance aware' cluster than those in segments A, B and C.
- Analysis of age group suggested that the 60+ age group are more likely to be 'guidance aware' than other age groups, while those in the 25-34 age group are more likely to be 'guidance agnostic' than average.
- Household composition appears to affect the use of storage guidance. Most strikingly, those living on their own were most likely to be 'guidance aware', while single parent households were most likely to be 'guidance agnostic'.

Links to other attitudes and behaviours

When these comparisons were conducted across the range of behaviours and attitudes in the baseline questionnaire it was found that:

- The 'guidance aware' appear more likely to purchase products which are reduced because they are near their date.
- They also appear more likely to look out for British and 'free range' products when they shop (this may be linked to the fact they are more likely to be in social segments A-C).
- The 'guidance aware' cluster appear more concerned by food waste and report that they make more effort to reduce waste – this suggests that reducing food waste may be a strong motivator for storing food carefully and correctly.
- The 'guidance aware' also appear slightly more willing to reduce their waste further: 80% of the guidance aware disagreed that 'Nothing would encourage me/my household to try and throw less food away', compared to 65% of the 'guidance agnostic'.

3.3.5 Attitudes to food risk theme

Background research from the literature review suggested that consumer perceptions of risk (or confidence about their ability to identify risk) and desire for 'freshness' were important factors affecting how they interpret and interact with date labels.

Two clusters were defined in this theme (Table 5). The larger 'safety sensitive' cluster is also the more well-defined, with members of the cluster almost always strongly agreeing or tending to agree with the cluster questions in Table 5. The smaller 'confident judges' cluster is less well-defined, with responses spread across the spectrum for each of the questions included.

Table 5 Attitudes to food risk theme summary

Questions Included [<i>in order of importance in determining the cluster</i>]	2 clusters were created, looking at participants' levels of concern about food risk and safety through their willingness to use food which is not of perfect quality.
Q18 – I worry about how safe it is to reheat leftovers that have been kept in the fridge for one or two days	Cluster 1: Confident judges [42%] This group seem to be more confident about food safety and reheating food, and more willing to try eating food which is not necessarily at its best. Cluster 2: Safety sensitive [58%] This group are very risk averse around their food and safety aspects of this, and are generally unwilling to attempt to eat food they perceive as potentially risky or not top quality.
Q18 – I'd rather throw food away than eat it when it's past its best	
Q18 – I'd rather throw food away than risk food poisoning	

Background characteristics

Comparisons of the demographics and background characteristics of different clusters in the attitudes to food risk theme found that:

- Those in social segments A and B appeared more likely to be in the 'confident judges' group, while those in C1 and C2 seemed more likely to be 'safety sensitive'.
- Those in the 35-44 and 45-59 age groups were more likely to be 'confident judges', but the 60+ group were much more likely to be 'safety sensitive'.
- The presence of children in a household did not in itself appear to influence participants' food risk concern, but household composition did (those specifically in single parents households appeared more likely to be 'safety sensitive', as were those living with other adults), while those living on their own, or with both adults and children, appeared more likely to be 'confident judges'.

Links to other attitudes and behaviours

When these comparisons were conducted across the range of behaviours and attitudes in the baseline questionnaire it was found that:

- Those who are 'safety sensitive' appear less likely to purchase products which are reduced because they are near the date on the label – 47% said they do this rarely or never compared with 21% of 'confident judges'. This reaffirms the notion that the 'safety sensitive' are less willing to use food which may be past its best.
- The 'safety sensitive' also appear more likely to rate the importance of freshness in food as a 'very important' consideration when food shopping – 81% of that group said this, compared to 66% of the 'confident judges'.
- 'Confident judges' are slightly more likely to say that food waste bothers them and more likely to say that they go to 'a great deal or a fair amount' of effort to minimise food waste in their household. A desire not to throw food items out unnecessarily may mean this group are more willing to try food after its best.
- The 'safety sensitive' appear more likely to think that it would be difficult for them to reduce their household food waste.

3.3.6 Food management behaviours theme

The smaller 'leftover leavers' cluster (Table 6), consistently report that they, on average, *rarely* engage in behaviours which make do with or use up food and leftovers already in their home. The larger 'fridge foragers' cluster, are less well defined but tend to engage in some of those behaviours at least some of the time.

Table 6 Food management behaviours summary

Questions Included [<i>in order of importance in determining the cluster</i>]	2 clusters were created. These group participants based on their willingness and ability to make do with and use up food they already have in stock at home.
Q12 - How often do you use leftovers for lunch/other meals?	<p>Cluster 1: Leftover leavers [34%] This smaller group generally claim to rarely or never engage in these particular activities which would make use of food towards the end of its life span.</p> <p>Cluster 2: Fridge foragers [66%] This majority group of participants claim to do at least some of these behaviours (using leftovers, using up food near or past best, and freezing) at least some of the time.</p>
Q12 - How often do you make use of fruit and vegetables that may be past their best in dishes like soups, smoothies and casseroles?	
Q12 - How often do you seek out recipes to help use up food that is approaching the date on the label?	
Q13 - To what extent do you freeze homemade meals, leftovers of food that you've bought but not used?	

Background characteristics

Comparisons of the demographics and background characteristics of different clusters in the food management behaviours theme found that:

- Those in social segments C1/C2 appear more likely to be 'leftover leavers' than others.
- Those in the 16-34 age group appear slightly more likely to be 'leftover leavers' than average, and those in 35+ age groups slightly more likely to be 'fridge foragers'.
- Those living with at least one other adult and at least one child seem more likely than average to be 'fridge foragers', while single parents seem more likely to be 'leftover leavers'.

Links to other attitudes and behaviours

When these comparisons were conducted across the range of behaviours and attitudes in the baseline questionnaire it was found that:

- 'Fridge foragers' appear more likely to shop for British or 'free range' products and to buy products which are reduced because they are near their date.
- They also appear more likely to enjoy cooking and cook main meals from scratch. This suggests that their interest in food and cooking skills in general may spill over into how, and whether, they keep and use food.
- 'Leftover leavers' are more likely to report that they waste more food and appear generally less concerned about food waste than 'fridge foragers', who are also more likely to claim they make *a great deal* or *a fair amount* of effort to minimise food waste.
- 'Fridge foragers' are more likely to agree that it would be difficult to reduce their household food waste than 'leftover leavers', but less likely to agree that *'nothing would convince me/my household to try and throw less food away'*.
- Lastly, 'fridge foragers' are more likely than 'leftover leavers' to say that the cost of food waste concerns them.

3.3.7 Shopping and stock management behaviours theme

The 'cupboard monitors / list makers' are the larger of these two clusters and also the more strongly defined (generally planning, taking a list and stock checking *most of the time*), while the smaller 'spontaneous shopper' group generally plan and stock check *some of the time* but *rarely* take a list (Table 7).

Table 7 Shopping and stock management behaviours theme summary

Questions Included [<i>in order of importance in determining the cluster</i>]	2 clusters were created around how much planning participants are engaging in with regards to their shopping and monitoring the amount of food they have at home.
Q5A - How often do you plan what you are going to buy before you go shopping?	<p>Cluster 1: Cupboard monitors / list makers [65%] This larger cluster generally claim to pre-plan their shopping, check what they have at home, and are more likely to take a list with them <i>most of the time</i>. They are generally aware of what they have and need to buy.</p> <p>Cluster 2: Spontaneous shoppers [35%] This smaller cluster plan what they are going to buy <i>sometimes</i> or <i>rarely</i>, don't often take a list, and check what is in their cupboards before they go <i>some of the time</i>.</p>
Q5B - How often do you take a list when you go shopping?	
Q4 - How often do you check what you have at home before you go food shopping?	

Background characteristics

Comparisons of the demographics and background characteristics of different clusters in the shopping and stock management behaviours theme found that:

- Those in social segments D and E appear slightly more likely to be 'cupboard monitors' than the other segments.
- Although a strong pattern for age groups was not evident, there seemed to be a higher tendency for those in the 35-44 age range to be 'cupboard monitors'. This may reflect a higher tendency for members of this age range to be running larger households as parents.
- Households with children were slightly more likely to be 'cupboard monitors', but this was created by a very strong planning tendency among households with more than one adult, while single parent households were actually slightly more likely to be 'spontaneous shoppers.'

Links to other attitudes and behaviours

When these comparisons were conducted across the range of behaviours and attitudes in the baseline questionnaire it was found that:

- Neither group were more or less likely to purchase food items which were reduced because they are near their date; an increased tendency to plan and stock check seems not to affect participants' willingness to do so.
- 'Cupboard monitors' appeared slightly more likely to cook from scratch more frequently – they may be more likely to require specific ingredients for their cupboard or a particular recipe, which would lead them to stock check and write lists more frequently.
- 'Cupboard monitors' also appeared slightly more likely to express concern about waste food and claim that they make an effort to minimise their food waste, but were also likely to report that it would be difficult for them to reduce their household food waste further.

3.4 Interactions between the behavioural themes

In this section, interactions between the five themes explored in section 3.3 are examined, in order to understand whether there are links or relationships between these five different groups of behaviours and attitudes. This will give an indication of whether the use of date labels and storage guidance could be viewed as an outcome of other attitudes or habits.

The analysis starts by examining the main findings of how date label and storage guidance behaviours relate to other types of attitude and behaviour (for example, food skills and attitude to risk) and then more general patterns of behavioural and attitudinal tendencies are considered. Identifying linked tendencies across cluster themes will show if these behaviours and attitudes around food can be grouped together or interrelated and therefore if there are more broad underlying 'types' of people. These patterns are based on the actual versus expected *proportions* of respondents with different combinations of cluster memberships and, therefore, are not absolute relationships – rather they are changes in the *relative probability* of being in a given cluster group.

The strongest interactions between the clusters are illustrated in Table 8 and discussed below.

Table 8 Summary of cluster analysis interactions

	Date driven	Date savvy	Date disengaged	Storage guidance aware	Storage advice agnostic	Confident judges	Safety sensitive	Leftover leavers	Fridge foragers	Cupboard monitors / list makers	Spontaneous shoppers
Date driven				0	0	--	++	0	0	0	-
Date savvy				0	0	+	-	+	-	0	+
Date disengaged				0	0	++	--	--	++	0	+
Storage guidance aware	0	0	+			+	-	--	+	+	-
Storage advice agnostic	0	0	-			-	+	++	-	-	+
Confident judges	--	+	++	+	-			--	++	0	0
Safety sensitive	+	-	-	-	+			++	--	0	0
Leftover leavers	0	+	-	--	++	--	++			-	++
Fridge foragers	0	-	+	++	--	++	--			+	-
Cupboard monitors / list makers	+	0	--	+	-	0	0	--	++		
Spontaneous shoppers	--	+	++	-	+	0	0	++	--		

Key:

'0' means that a member of one cluster is no more or less likely than average to be a member of another cluster;

'+' a member is more likely than average to be a member of another cluster;

'++' a member is a lot more likely;

'-' a member is a little less likely; and

'--' a member is a lot less likely.

Looking first at just the date label and storage guidance themes, key insights are that:

Date label behaviour is not related to storage guidance behaviour

We could hypothesise that those who use date labels on food packaging would also use storage guidance, since they may have a broader tendency to use information on food packaging. However, no relationship was found between these two sets of behaviours.

Date label behaviours relate most strongly to attitude to risk

Those who pay the most attention to date labels, the 'date driven', are more likely to have heightened concerns around food safety; 71% of those who were 'date driven' were also 'safety sensitive' compared to only 33% of those who were 'date disengaged'.

Those who were 'date savvy' were slightly more likely to be 'confident judges' than to be 'safety sensitive'. It therefore appears that there is a relationship between some date label behaviours and food risk sensitivity. This

supports the findings of the literature review that a stricter interpretation of food date labels may arise from heightened safety concerns.

Storage guidance behaviour relates most strongly to food management behaviours

Those who reported using storage guidance the most, the 'storage guidance aware', were more likely to be 'fridge foragers' than 'leftover leavers'. Conversely, those who pay less attention to them, the 'storage guidance agnostic' group, were more likely to be 'leftover leavers'.

This suggests that those who are engaging in activities which make use of food already in the cupboard are more likely to pay attention to instructions or guidance relating to storage of their food. However, we cannot imply from this analysis whether one behaviour is causing the other (for example, if those who properly store their food are more confident using it, or if those who know they will, or can, use up unfinished or opened foods are more careful in storing them) or if they share a separate root cause.

3.4.1 Are there overarching 'types' of people?

Alongside understanding the specific links to, and between, date labels and storage guidance, it is also interesting to link these behaviours both to and *within* a wider context of attitudes and behaviours. Conceptualising these interactions is important in understanding how important date labels and storage guidance are as factors in driving food waste at all points in the household food journey. Furthermore, identifying tendencies across cluster themes will show if there are behaviours or attitudes around food which can be broadly grouped together and, therefore, if there may be underlying 'types' of people (also shown in Table 8).

Date label behaviours and other food attitudes and behaviours

Alongside the relationship between date labels and attitude to risk, some other, weaker, relationships were found between date label behaviours and other behaviours.

- Date labels and food management: those who were 'date savvy' were slightly more likely to be 'leftover leavers' than 'fridge foragers', while the 'date disengaged' were more likely to be 'fridge foragers'.
- Date labels and planning: the 'date driven' were slightly more likely to be 'cupboard monitors / list makers' than 'spontaneous shoppers'.

Overall, it appears that those who pay the most attention to dates are not only more concerned about food risk but also more likely to plan their shopping, while those who generally ignore dates (the 'date disengaged') and are more relaxed about food safety are more likely to be able or willing to make use of leftovers and foods past their best.

Finally, those who pay attention to dates some of the time - but inconsistently – are slightly less likely to be able or willing to make use of their leftovers and food past its best.

Storage guidance behaviours and other food attitudes and behaviours

As noted, storage guidance behaviours are most strongly related to food management behaviours. However, links with other behaviours were also evident:

- Storage guidance cluster membership is related to the stock management and planning clusters; the 'guidance aware' appear more likely to be 'cupboard monitors / list makers'.
- The 'guidance aware' also appear more likely to be classified as 'confident judges'.

Overall, those who pay the most attention to storage guidance not only appear more likely to use up food past its best, they also seem more likely to monitor their stock and plan their shopping trips and to be less worried about food safety.

Interactions between other attitude and behaviour themes

The three other clusters also appeared to have some effect on membership of each other:

- A strong relationship appears to exist between attitudes to risk and food management skills – 'fridge foragers' are more likely to be 'confident judges' and 'leftover leavers' are more likely to be 'safety sensitive'.
- A strong relationship also appears between shopping and planning and food management skills – 'fridge foragers' are more likely to be 'cupboard monitors / list makers' and 'leftover leavers' are more likely to be 'spontaneous shoppers'.

Membership of a particular risk attitude cluster appears to have no impact on which shopping and planning cluster an individual is in.

Building up the 'bigger picture' of behaviour patterns

The sections above have outlined how our five sets of attitudes and behaviours relate to each other. We cannot imply a direction of causation for any of these relationships from this data (and the more general caveat presented above should not be forgotten) but we were able to explore a picture of how certain types of attitude and behaviour have tendencies to go together.

The behaviour set which appeared to have *some* relationship with all four others was that of food management and skills:

- 'Fridge foragers' had an increased probability of being 'confident judges', 'cupboard monitors / list makers', 'storage guidance aware' and 'date disengaged'.
- 'Leftover leavers' were more likely to be 'safety sensitive', 'spontaneous shoppers', 'storage guidance agnostic' and 'date savvy'.

This implies that those who claim to use leftovers, use or freeze food rather than letting it pass its food date (fridge foragers) may have a higher tendency towards a more relaxed approach to food safety, to monitor their stock and plan their shopping trips, pay attention to and follow storage guidance on food packaging and generally ignore date labels at the supermarket and at home. Conversely, those who do not want or try to use up leftovers and food which is past their best also seem likely to be more concerned about food safety, not monitor what they have in the house or plan their shopping, ignore storage guidance on food packaging and pay attention to date labels fairly inconsistently.

It is noticeable that the 'date driven' group are the only ones who do not have a particular tendency towards *either* food management behaviours cluster, even though it does relate to other attitude and behaviour groups. This suggests either that a heightened awareness and use of date labels is not driven or discouraged by knowledge of food management techniques, or that other links (such as with risk awareness) are much stronger.

However, these are *tendencies* and *links* between these behaviour and attitude groups, rather than direct or absolute relationships; the links between these different behaviours and attitudes are more complex than the larger groupings described above and not all of the behaviours within those larger 'meta-clusters' are consistently related to each other. For example, there are date label and storage guidance behaviour groups related to both of the food management behaviours clusters, yet, when compared separately, no date label to storage guidance group relationship was found. The reality is that only a small minority of cases actually fit into these two patterns; the majority of people are somewhere in between these two extreme cases.

The point is that these groups of behaviours and attitudes are not related in simple, direct ways that we can observe here – the interrelationships between, and roots of, these behaviours and attitudes are very subtle and complex and cannot be placed in discrete categories in this way. In trying to influence storage guidance and date label behaviour, therefore, it is important to acknowledge that a myriad of underlying characteristics, attitudes, habits and motivations are at play and the range of ways in which consumers interpret and interact with these as on-pack information sources are very broad.

3.5 Summary

In this section, the topline findings and cluster analysis of the baseline questionnaire filled in by kitchen diary participants have been presented. This has provided insights into the typical range of behaviours around date labels, storage guidance and the overall household food journey, but has also enabled an exploration of the ways in which groups of behaviours and attitudes around food interact.

The focus has been placed on five groups of attitudes and behaviours, including date label behaviour, storage guidance behaviour and other behaviours and attitudes that were hypothesised to influence the way in which consumers interpret and utilise date labels and storage guidance.

With regards to date label behaviour, it can be concluded that:

- Reported use of date labels is generally quite high, but the way dates are being used is not necessarily clear; without prompting, only 15% and 14% of our respondents mentioned and correctly defined 'use by' and 'best before' dates respectively. The ways in which they defined dates was highly varied and tied into their practical, personal and contextual interpretations of how date label information should be *applied*.
- Those who pay a lot of attention to date labels are generally also highly risk averse around food, or lacking confidence in their knowledge of food safety and quality and are more likely than others to perceive reducing food waste as difficult. However, there was no observed connection between high use of date labels and kitchen skills, such as using up leftover food.

- Those who pay limited attention to date labels are less wary about food safety and quality issues, more likely to be concerned about household food waste and believe they generally waste less food than others.

With regards to storage guidance behaviour, it was found that:

- Reported use of storage guidance is even higher than for date labels – more than 80% claim to follow them the majority of the time (although this figure is not consistent with our qualitative research element – see section 5 for further discussion).
- For storage guidance, unlike date labels, social demographics were important: social segments A, B and C were more likely to follow storage advice more frequently and strongly, compared to segments DE, as are those in the 60+ age group. It was also found that those living on their own are most likely to report that they follow storage guidance, with single parent households the least likely.
- Those who pay the most attention to storage guidance are more likely to purchase reduced price products. They are also more concerned about food waste and report making more effort to reduce their waste. They were also more likely to say they would be willing to reduce their waste further.
- Those who reported using storage guidance the most were more likely to manage and make use of leftovers and food past its prime.

Reported date label and storage guidance behaviours were not found to be related. Although there were links between the five attitudes and behaviours which were examined here, no overarching or larger behavioural or attitudinal groups emerged from those links. Overall, this analysis suggests that while the links between different behaviours and attitudes around food are complex, date label and storage guidance behaviours may still be best understood as outcomes of the wider landscape of food behaviours and attitudes.

In the next section, this analysis will be carried forward to compare reported behaviours and attitudes to the kitchen diary outcomes, in order to investigate and explore which attitudes and behaviours may impact upon the quantities and causes of food waste in households.

4.0 Findings of the kitchen diaries

4.1 Introduction

In order to investigate how and why avoidable food waste occurs, behaviours were probed using kitchen diaries to record waste. Avoidable food waste makes up the majority (around 65%) of food and drink thrown away by UK households, most of which is reported as being due to cooking, preparing or serving too much, or not using food in time (reported as having 'passed a date label' or 'looked/smelt bad') (WRAP, 2009b).

The literature survey revealed that attempts to gather useful data on reasons for throwing food away that occur out of a food context (e.g. in a survey) may be unreliable, since people may not be able to accurately recall habitual and often subconscious behaviours. The kitchen diary was chosen as a methodology as it offered the opportunity to capture information at the point of decision-making. For two weeks at the end of May 2010, participants were asked to fill in their kitchen diary every time they threw food away, excluding food that could not be eaten (peelings, bones, tea bags etc.) and scraps (unfinished tea or coffee, scraps left on plate after a meal etc.). Participants were provided with bold yellow bin stickers as a memory prompt to fill in their diaries and the diaries were designed to be user friendly and fun to use.

The aim of the kitchen diary research was to gain an understanding of:

- 1 The role of date labels in food disposal decisions and their importance relative to other drivers of food waste.
- 2 The role of food storage behaviours and on-pack storage guidance in waste behaviours, since the literature suggests that poor storage of food is often a driver for food being wasted.

The diary recording sheets asked a range of questions, which sought to explore the context of food waste decision-making as broadly as possible. As well as situating date labels and storage guidance within a wider food context, including a range of questions about other factors, they helped avoid priming participants on the issue of date labels and storage guidance. Participants were asked to record in their diary the detail of what they threw away over the two week period, including the type of food it was, how much of it was thrown away, how it had been stored and any food dates on the labels. In addition, the diaries included questions about *why* each food item was thrown away and the decision point at which the disposal decision occurred (e.g. 'around mealtime', 'when unpacking shopping' and so on). A sample of the kitchen diary can be seen in appendix 3.

It is important to note that the results presented in this chapter are based on a relatively small sample size (168 individuals completed the questionnaire). The results are presented in isolation in this chapter for the sake of transparency. Their full significance and value, however, emerges when they are considered as part of the overall suite of research approaches adopted by this study. **The findings presented in this chapter should thus be treated with that perspective in mind, and interpretation of these findings in isolation should be undertaken with caution.**

4.2 Topline findings

4.2.1 Total number of diaries and average items per diary

In total, 180 diaries were distributed and 168 completed diaries were returned for analysis. The total number of reported food waste items was 2,227, giving an average number of avoidable food waste items per household of 13.3 over the two week period. The maximum number recorded was 41 items and the minimum was zero.

4.2.2 Diary entries broken down into product categories

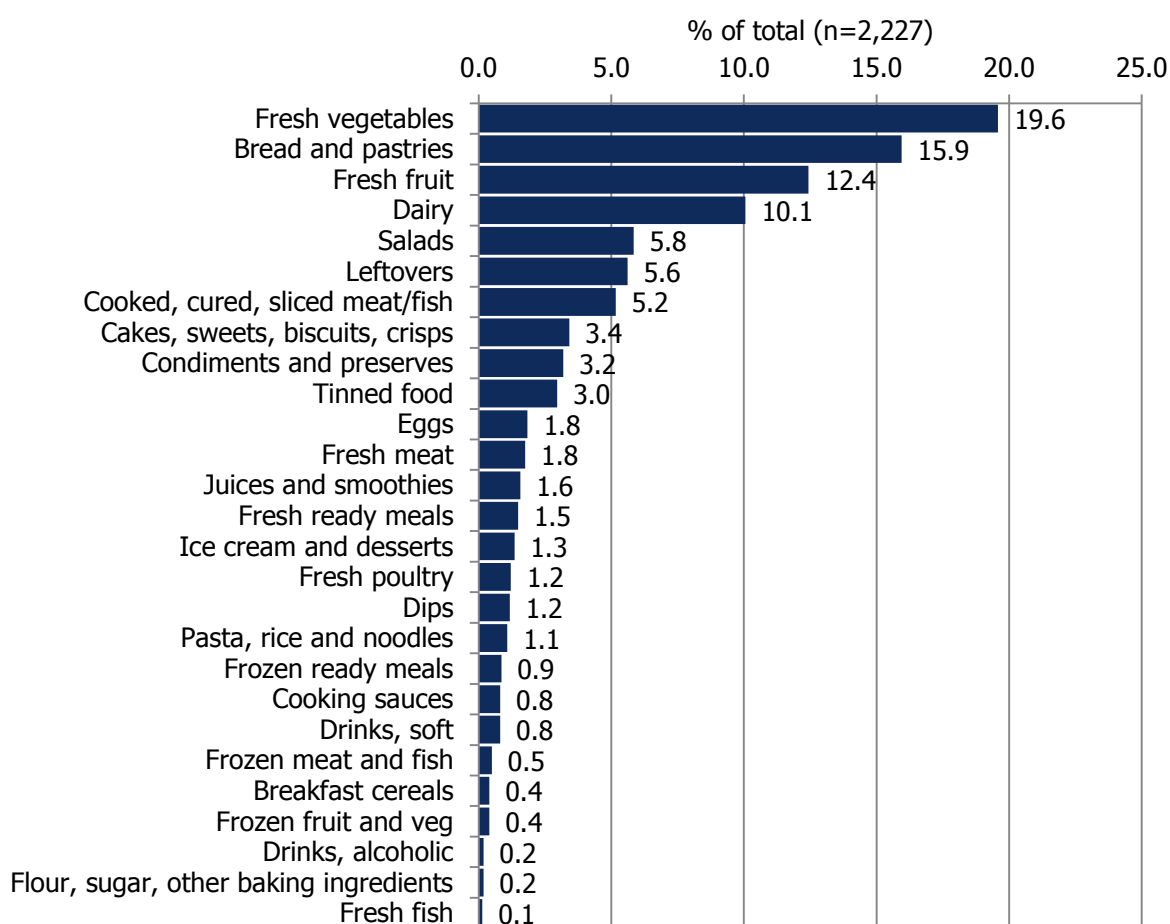
Diary entries were broken down into 28 product categories, which enabled a clear overview of food waste patterns by product. Figure 1 shows all food items thrown away over the two week period by the 168 participants, split into food categories. WRAP's compositional research (WRAP, 2009b) revealed similar proportions by food group, as Table 9 shows.

Table 9 Proportions of food waste from WRAP's 2009 compositional research (WRAP, 2009b) compared with the kitchen diary exercise completed as part of this research

Food category	WRAP research	Kitchen diary completed for this research
Fresh vegetables and salad	23%	25%
Drink ¹³	16%	3%
Fresh fruit	13%	12%
Bakery	10%	16%
Meals	8%	8%
Meat and fish	7%	9%
Dairy and eggs	7%	12%
Other	16%	15%

Note: The figures for the WRAP research are for the 'Proportion of weight of all food and drink waste, split by group', whereas the figures for this research are based on items reported. Kitchen waste categories have been mapped to the WRAP categories as closely as possible. Both sets of figures apply to avoidable food waste.

Figure 1 All items thrown away by product category



¹³ The considerable discrepancy between figures for 'Drink' can perhaps be partially explained by instructions in the kitchen diary not to record unfinished tea or coffee. Additionally there may be a methodological reason for the kitchen diary figure being this low, such as participants forgetting to include drinks in the diaries.

4.3 Why products were thrown away

For each food item recorded in the kitchen diary, participants were asked to record why the food was thrown away. The instructions asked respondents to rate the importance of each of six pre-defined reasons for each item (see Figure 2). These reasons were derived from the literature review and designed to expose different behavioural drivers in order to assess the relative importance of dates in the decision-making process.

Figure 2 Detail from a kitchen diary recording sheet

3. How important were the following as reasons why you threw it away?

	Less important			More important		
	N/A	1	2	3	4	5
It looked/smelt off	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It was after the date on the label	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I had nowhere to store it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I didn't like it/want to eat it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I replaced it with a new one	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It had been opened too long	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Other (please specify)

Comments:

This section presents the findings from analysis of the diary entries:

- The relative importance of use of date labels compared to other reasons why food was thrown away.
- How this varied across product category.
- The insights that can be drawn from these results with regard to consumers' use of food dates and consequent food waste behaviours.

4.3.1 Rationale behind diary design

The options for recording why food was thrown away were conceived as follows:

- 'It looked/smelt off' was designed to test the use of participants' judgement.
- 'It was after the date on the label' was a link to date label use.
- 'I had nowhere to store it' was connected to storage behaviours.
- 'I didn't like/want to eat it'.
- 'I replaced it with a new one' was concerned with planning and food management.
- 'It had been opened too long' was connected to storage behaviours.

All six reasons were included to avoid priming respondents to the issue of date labels and to gain a sense of the relative importance of date labels within a range of possible reasons for throwing food items away.

'Other' was used on 134 items; they included a wide range of reasons: accidents, allowing the food go off, preferring not to eat something, being too full etc. Given their small number, and the fact the reasons given did not reveal anything 'new', the 134 were not coded for inclusion in subsequent analysis. Comments were included in 1,322 entries and these were reviewed qualitatively.

4.3.2 'It looked/smelt off' was the most frequent response

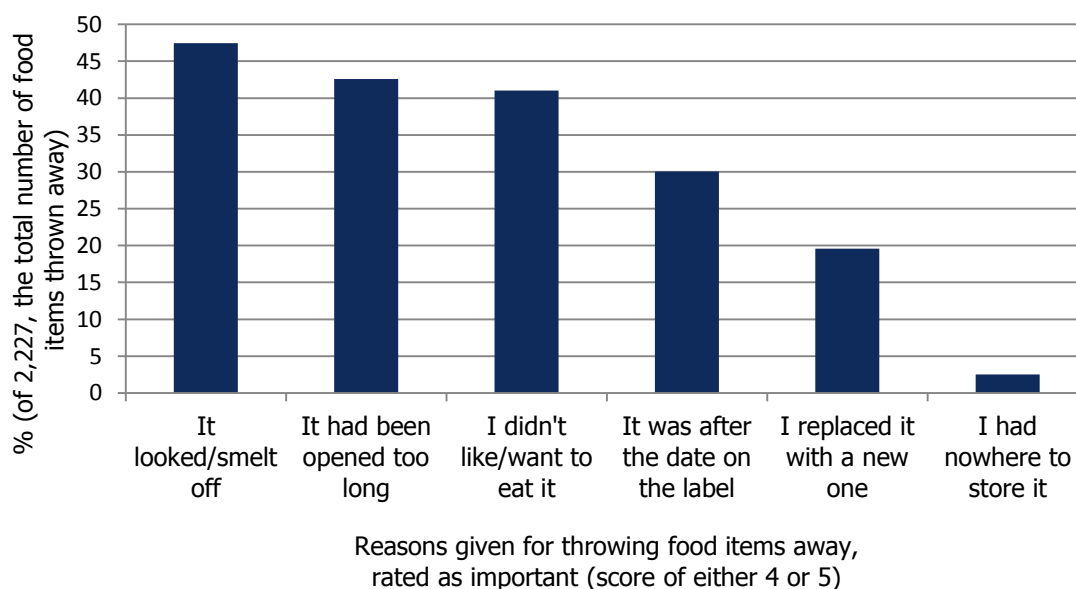
The use of sensory judgement - 'It looked/smelt off' - was the most common reported driver given for throwing food away. This option was rated as important in 47% of diary entries. This was followed by storage

considerations ('It has been opened too long') and issues of taste or inclination ('I didn't like / want to eat it'). 'It was after the date on the label' was reported as important in 30% of the kitchen diary entries.

Table 10 shows all responses given for reasons why food was thrown away, for the six questions described above. In general in the analysis '4' and '5' responses have been combined and taken to mean 'important'.

Figure 3, below, shows how frequently each reason for disposal was rated as important (scoring either '4' or '5' in the diary recording sheets¹⁴) overall. As noted above, respondents were asked to rate all six reasons for each item they threw away.

Figure 3 Relative frequency of important reasons food items were thrown away, n=2,227



¹⁴A score of '4' or '5' has been taken to imply that a reason is important here and throughout the section.

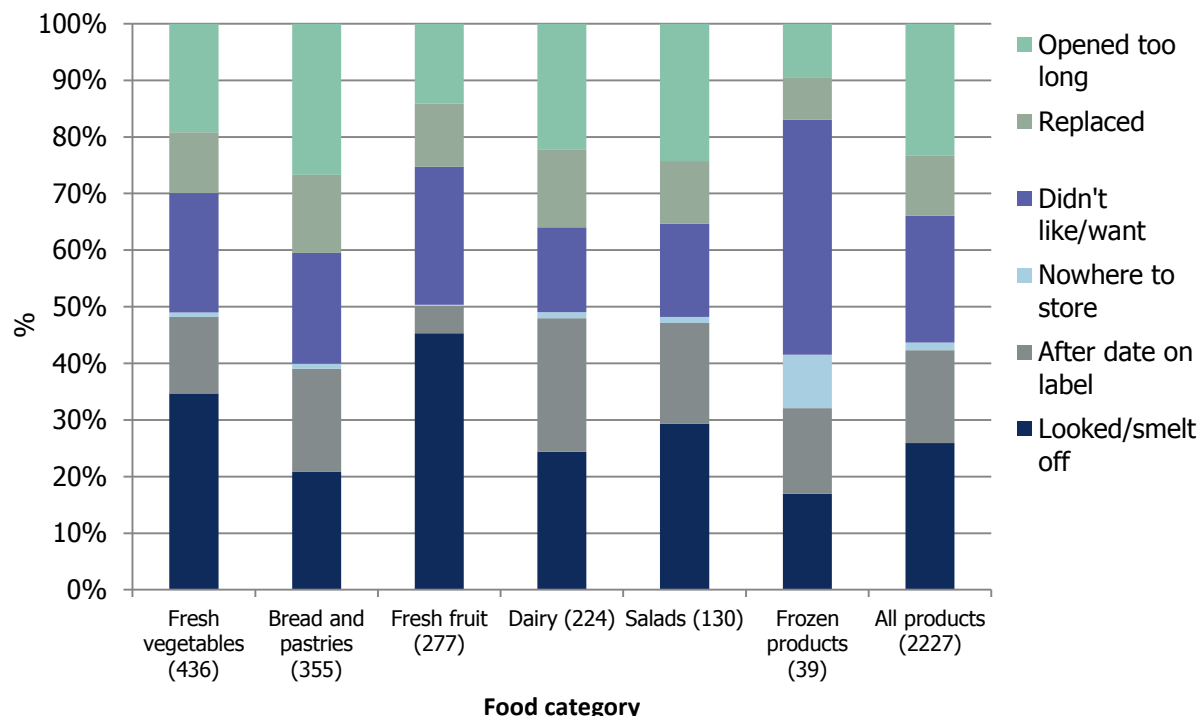
Table 10 “How important were the following as reasons why you threw it away?” n=2,227

Importance	It looked/smelt off		It was after the date on the label		I had nowhere to store it		I didn't like it/want to eat it		I replaced it with a new one		It had been opened too long	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1 – Least	153	6.9	207	9.3	409	18.4	194	8.7	294	13.2	138	6.2
2	96	4.3	71	3.2	46	2.1	89	4.0	65	2.9	42	1.9
3	127	5.7	94	4.2	18	0.8	160	7.2	83	3.7	98	4.4
4	227	10.2	131	5.9	21	0.9	269	12.1	135	6.1	258	11.6
5 - Most	830	37.3	538	24.2	35	1.6	645	29.0	301	13.5	690	31.0
n/a	435	19.5	790	35.5	1,163	52.2	509	22.9	859	38.6	622	27.9
Sub-total	1,868	83.9	1,831	82.2	1,692	76.0	1,866	83.8	1,737	78.0	1,848	83.0
missing	359	16.1	396	17.8	535	24.0	361	16.2	490	22.0	379	17.0
TOTAL	2,227	100.0	2,227	100.0	2,227	100.0	2,227	100.0	2,227	100.0	2,227	100.0

4.3.3 Reasons for throwing food away applied to selected product categories

To further understand the use of date labels and storage guidance, reasons for disposal were examined within the context of different product categories. Figure 4 shows how the patterns of important reasons (i.e. factors rated 4 or 5) for why food was thrown away change across product categories¹⁵.

Figure 4 Relative importance of reasons for selected product categories, normalised to 100% for comparative purposes



Certain patterns can be observed from Figure 4:

- The reported importance of food dates at the point of disposal is fairly consistent across selected product categories, with the exception of fresh fruit, where date labels are seldom cited as an important factor in disposal decisions¹⁶.
- Reasoning for throwing away fresh fruit is dominated by judgement of look and smell; fresh vegetables to a slightly lesser extent.
- The most common reason given for throwing away frozen products was because the participant didn't like or want to eat them.
- Frozen products are, notably, also more likely to be thrown away due to lack of storage space.
- Bread and pastry products, dairy and salads have frequently been opened for too long at the point of disposal.

4.3.4 Selected reasons applied to all product categories

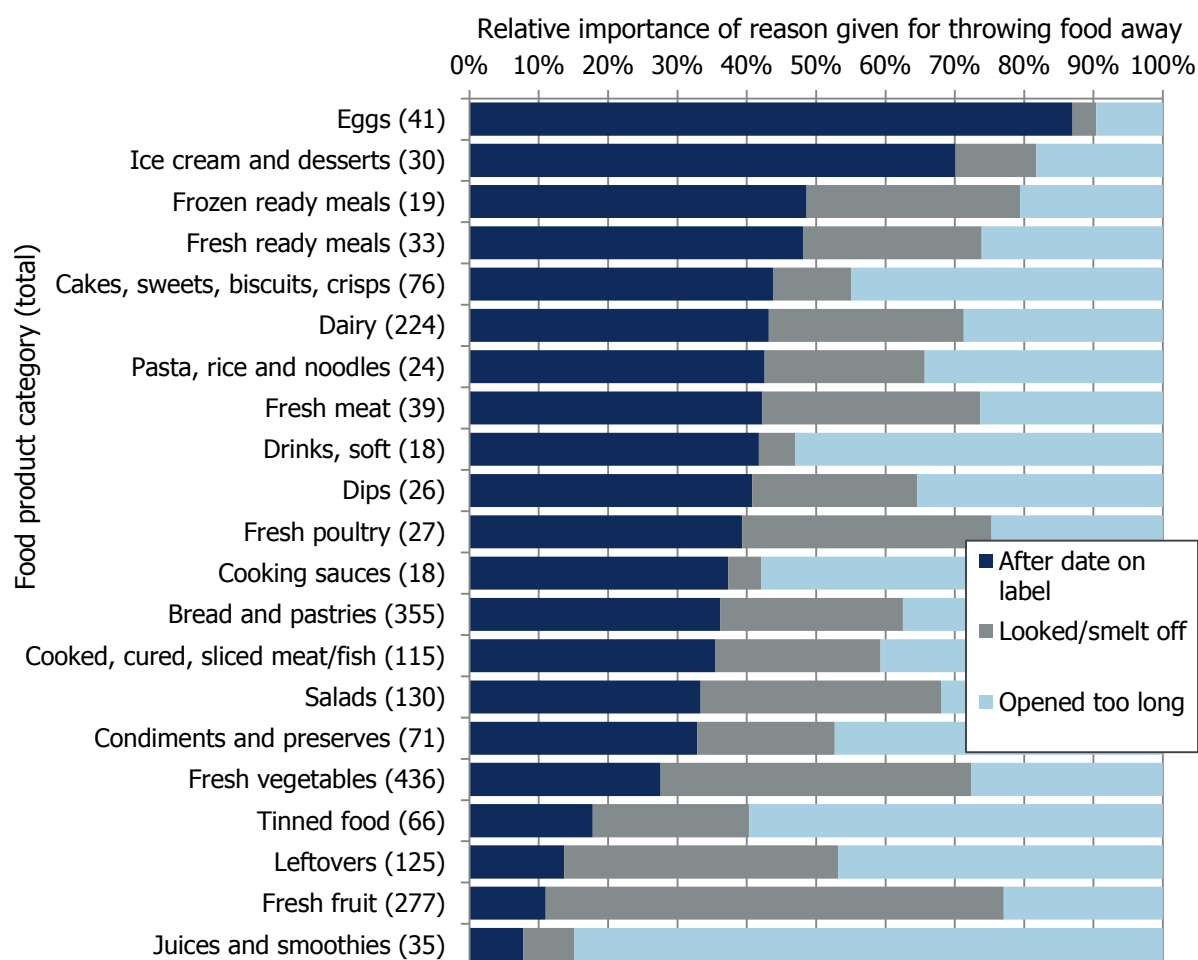
In order to build a picture of why particular food items are thrown away, the three reasons most relevant to the study questions have been plotted for each food category. Figure 5 shows the relative frequency of these three reasons for all product categories. The reasons under analysis are 'It was after the date on the label', 'It looked/smelt off' and 'It had been open too long', which relate specifically to the reported use of date labels and storage guidance.

The chart highlights the relative importance of the date label in disposal decisions for different product categories. Clear patterns emerged from the diary data; for example, in over 80% of disposal decisions around yoghurts and eggs, the date label was rated as important, compared to just 11% of disposed fresh fruit. In the case of drinks (including fruit juices and smoothies), cooking sauces and tinned food, the most common reason for disposal was that they had been open too long.

¹⁵The "Frozen products" category includes "Frozen fruit and veg", "Frozen meat and fish" and "Frozen ready meals".

¹⁶Note, only a quarter (25%) of recorded items in the "Fresh fruit" category were stored in their original packaging, such that a date label is far less likely to be reported.

Figure 5 Relative frequency of important reasons why food items were reported as thrown away, for all categories¹⁷ and selected reasons why



This chart suggests that for certain products, where consumers have less confidence in their ability to use their judgement to gauge whether a food item is off, they are relying more on the date label, as suggested by entries at the top of Figure 5. This judgement may be sensory or based on experience with a particular food type. The nature of this judgement as part of a complex decision-making process is examined through the different approaches taken in this study.

For example, the rarity of instances where yoghurt is disposed of due to the look or smell may suggest that consumers find it difficult to tell if an item is unfit for consumption, perhaps due to sealed packaging or attitudes towards dairy products being off. In such cases, this may explain the high reported use of date labels in decision-making. At the other end of the scale, fresh fruit and vegetables may be easier to assess without recourse to date labels; in these cases the date on the label appears less often as a reason for throwing items away and the look and smell is referred to more often.

4.4 When food was thrown away relative to the date on the label

The research sought to explore the pattern of disposal relative to any date on label, so for each food item they threw away, participants were asked to enter the date that they threw the item away, and record all dates visible on the food label.

Across the entire data set of 2,227 food items, participants recorded a single date 817 times, two dates (e.g. 'best before' and 'display until') 305 times and no date 1,105 times.

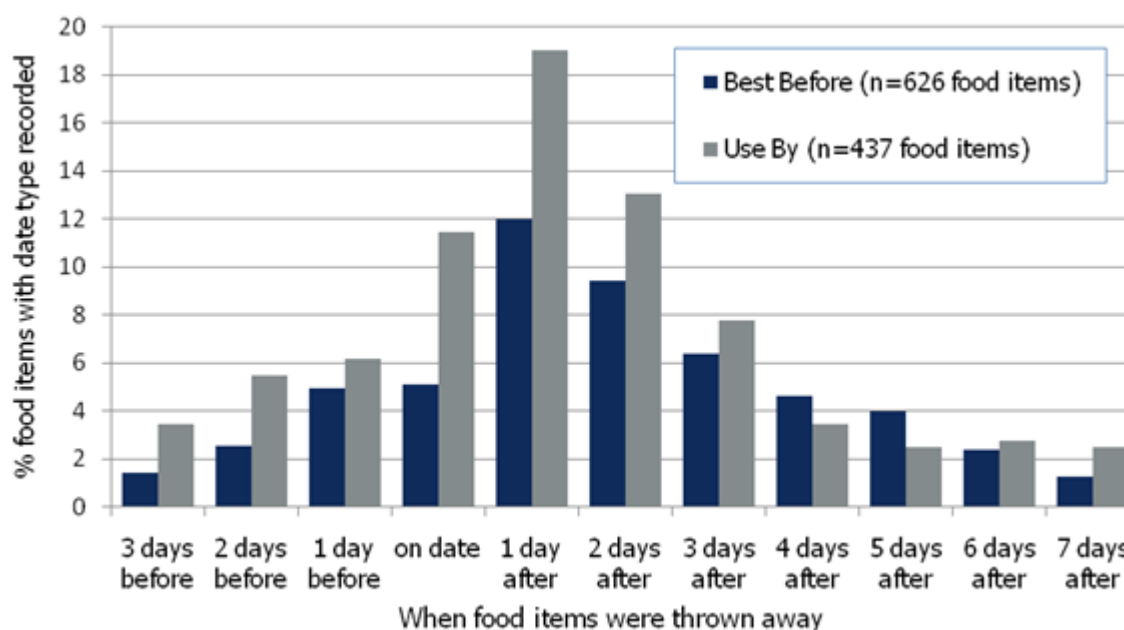
¹⁷Note that the smallest six categories have been omitted from this graph.

A 'best before' date was reported 626 times (476 occasions alone, 155 in conjunction with 'display until'), a 'use by' date 437 times (290 times alone, 138 times in conjunction with 'display until') and 'display until' was recorded 322 times (37 times alone and otherwise with 'best before' or 'use by'). There were 32 entries where participants recorded a 'sell by' date.

As with the kitchen diary dataset in general, and as explained at the beginning of this chapter, the complex range of influences on consumers suggests a cautious approach to drawing conclusions from the results; interpretations become more justifiable as the data are combined with results from elsewhere in the project.

An initial analysis plotted the difference between the date on the label and the date of disposal, which gives an indication of whether items tended to be thrown away before, on or after the date on the label. Figure 6 shows this approach applied to the three most common date label types. For the sake of clarity, items thrown away >3 days before and >7 days after the date on the label have been omitted from the graph. These entries are discussed below. Note, also, that some items thrown away before a date on the label may have been opened some days previously and then disposed of in light of an 'eat within x days' instruction on the pack. The data gathered do not, unfortunately, enable this to be separately identified.

Figure 6 Difference between disposal date and the date on the label, for three date label types¹⁸, n=1,329 (which refers to all items in the dataset for which a date was reported by respondents).



These data show a peak in food items with both 'use by' and 'best before' dates being thrown away the day after the date on the label. While this may indicate correct usage of 'use by' dates, the sudden increase in values at 1-2 days after the date for food carrying a 'best before' date may indicate that that some people are incorrectly using this label as an 'use by' date, rather than a quality guideline. Alternatively these results may highlight an unwillingness to compromise on quality. Each label type is considered in turn below.

4.4.1 'Best before' dates (n=626 food items)

The data show that of products for which a 'best before' date was recorded, 30% were disposed of before the date on the label, 5% on the label date itself, and 65% after the date on the label. The most frequently occurring were one, two and three days after the date on the label. The peak in entries one day after the date on the label suggests that 'best before' may be playing a part in disposal decisions.

For items thrown away after the 'best before' date, the order of the main product categories changes and different insights can be gained. In summary:

¹⁸Although the range of differences between label dates and when items were thrown away included items thrown away more than 100 days before and after the date on the label, for clarity, these outliers have been excluded and Figure 6 focuses on the period immediately around the date on the label. Note that this graph shows percentage figures of the total number of items carrying each date type, including outliers, rather than frequencies.

- Overall, where 'best before' dates were reported for food items being thrown away, the main food categories were "Fresh vegetables" (20%), "Bread and pastries" (16%) and "Fresh fruit" (12%), followed by other product categories in much smaller numbers.
- For items thrown away one day after the 'best before' date, the composition of product categories is mainly "Bread and pastries" (48%) and "Fresh vegetables" (12%). These food items, and those thrown away still further from the date on the label, may simply demonstrate that consumers are keeping items for longer, or imply that they are more comfortable with eating food that is past its best.
- For items thrown away between one and four days *before* the 'best before' date, the majority of items fell into the "Bread and pastries" category (51%) with a smaller number in the "Fresh vegetables" category (14%).

4.4.2 'Use by' dates (*n=437 food items*)

Of products for which a 'use by' date was recorded, 29% were thrown away before the date on the label, 11% on the date itself and 60% after the date shown.

Items thrown away between one and four days *before* the 'use by' date were mainly from three product categories: "Dairy" (27%), "Salads" (18%) and "Bread and pastries" (12%).

Items carrying 'use by' dates were most likely to be thrown away one day after the date on the label. The next most likely date was either two days after the date or on the date itself. These results could indicate that respondents were willing to take a food safety risk; or that they had simply waited until the 'use by' date had passed before disposing of the food. Recall that respondents were invited to record the date on the label only after they had disposed of the food: it may be, for example, that householders selected the item for prospective use and, upon noticing the date, then made the disposal decision.

In summary:

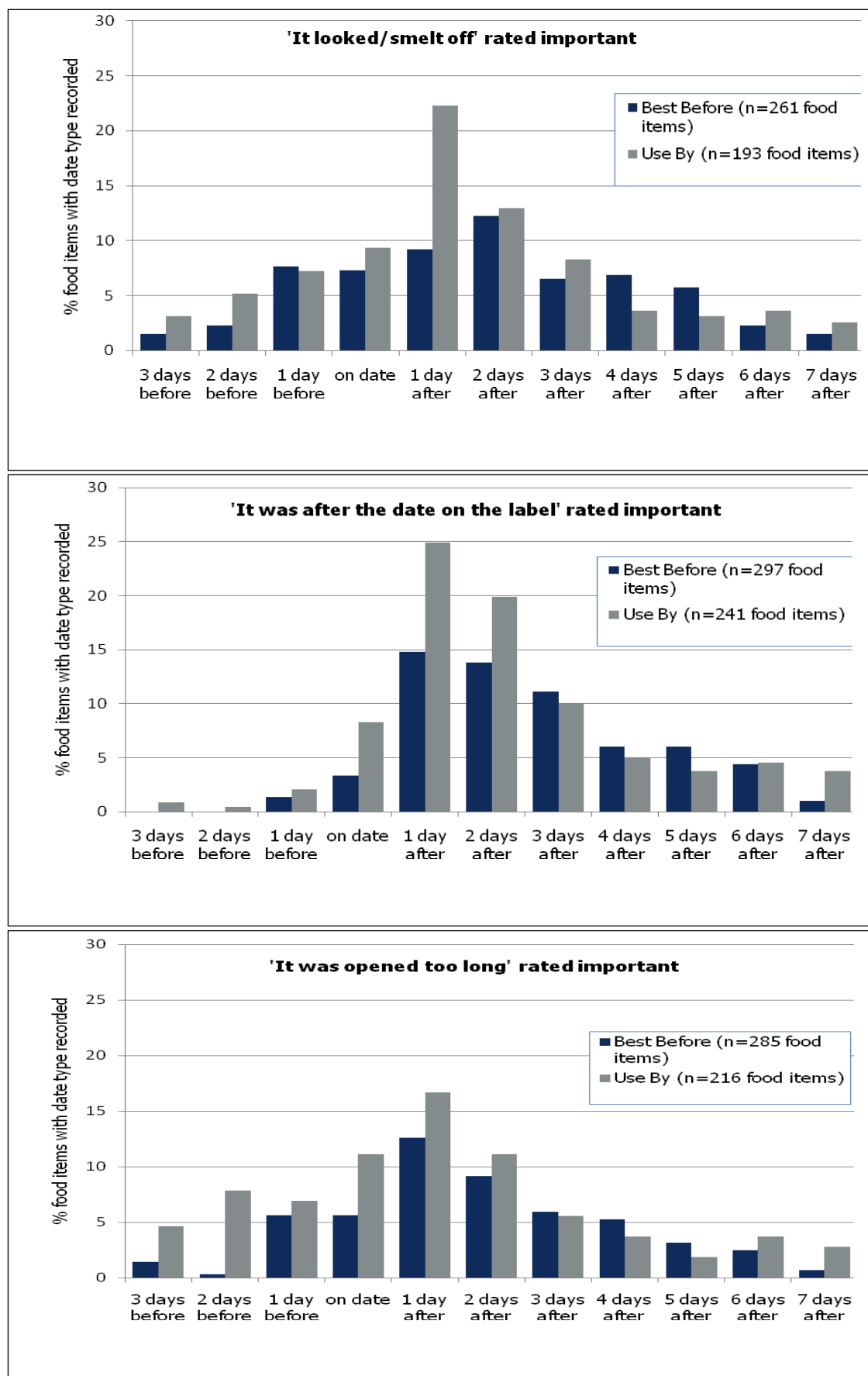
- Overall, where 'use by' dates were reported in connection with food disposal, the most common food product categories recorded were "Dairy" (26%), "Salads" (16%), "Cooked, cured, sliced meat/fish" (14%) and "Fresh vegetables" (10%)¹⁹. The items thrown away 2-4 days before the 'use by' date were predominantly in the "Dairy" (32%), "Salads" (22%) and "Cooked, cured, sliced meat/fish" (14%) categories. It is possible that these items include some which were already opened and where the 'use within x days' superseded the 'use by' date.
- Items thrown away on the 'use by' date itself fell largely into four product categories. These were "Dairy" (26%), "Salads" (16%), "Cooked, cured, sliced meat/fish" (16%) and "Bread and pastries" (12%). These latter items may suggest some misinterpretation of 'use by' dates.
- As the date passes, the proportion of "Fresh vegetables" increases to 18% for '1 day after date' and "Cooked, cured, sliced meat/fish" (11%) falls. "Dairy" rises to 35% and "Salads" to 22%.
- At '2-4 days after date' differences across product categories diminish, with "Dairy" (20%) and "Salads", "Cooked, cured, sliced meat/fish", "Fresh vegetables" and "Yoghurts" being thrown away in roughly equal measure.

4.4.3 Links between reasons for disposal and when food was thrown away

So as to position date use against other factors potentially influencing disposal decisions, an examination was conducted into whether there were any notable relationships between when food was thrown away relative to the date on the label and the reasons given for why the food was thrown away. Figure 7 shows the results of this analysis for food that was thrown away because 'It looked/smelt off', was 'Past the date on the label' or had been 'Open too long'.

¹⁹ The fact that there were 42 recorded instances of 'use by' dates in the "Fresh vegetables" category overall in the kitchen diaries suggests either that the items were processed or prepared (a category error) or that a different date was present (participant error).

Figure 7a, b and c Selected reasons for disposal, plotted against when food was thrown away



When food was thrown away and 'It looked/smelt off' was given as a reason

The judgement that a food item looked or smelt off is most likely after the date on the label has passed for both 'best before' and 'use by' dates, as can be seen in Figure 7a. Where items were thrown away due to looking or smelling off, those that carried 'use by' dates were most commonly thrown away either one or two days after the date on the label. Those carrying 'best before' dates were more evenly distributed.

When compared to the overall 'use by' date distribution (see Figure 6) the decrease in items thrown away on the date strengthens the evidence that suggests that these dates were not interpreted correctly.

The decrease in items thrown away one day after the 'best before' date as compared to the total distribution plotted in Figure 6 suggests that items thrown away at that time frequently are not judged to look or smell bad. This provides further evidence for the hypothesis that consumers are throwing food away on the 'best before' date as a result of an incorrect understanding of the date label.

When food was thrown away and 'It was after the date on the label' was given as a reason

Figure 7b also shows the 669 food items where respondents have cited the dates on the label as the reason for disposal. However, the cases in which food is thrown away before the date could point to behaviour which is contributing a large amount to avoidable food waste. For instance, food which is thrown away on the 'use by' date should not have been thrown away because 'It was after the date on the label' – the food may be eaten until the end of the date on the label.

The issue may be complicated if a pack also has 'use within x days' information, which takes precedence over the 'use by' date once the product has been opened and may account for items thrown away on or before the 'use by' date.

Additionally, the sudden increase in items carrying a 'best before' date and thrown away on the day after the date on the label suggests that 'best before' dates are being misinterpreted as strict cut-off dates; alternatively, this may point towards a strict attitude to food quality.

When food was thrown away and 'It was opened too long' was given as a reason

Finally, Figure 7c plots the instances where respondents considered items to have been open for too long. This reason was included in the kitchen waste diary as a means to gauge the scope for improved storage (and possibly improved storage guidance) to reduce food waste. Items that have been thrown out because they have been open for too long suggests either a failure in food stock management, incorrect storage behaviour or a combination of the two. The contributing factor of pack sizes or volume promotions must also be considered here – 'It was opened too long' indicates that the product was consumed too slowly, implying that consumption was slower than anticipated or that the pack was too big relative to the rate of consumption.

The graphs above strengthen the evidence which suggests that date labels are being interpreted incorrectly by some consumers, even though food items are generally stated to have been thrown away after the date on the label. However, it is possible to draw more nuanced conclusions from the plots, in particular by noting that 'best before' dates are being used as strict dates by some and that 'use by' dates are being mis-used to throw food away on the date itself.

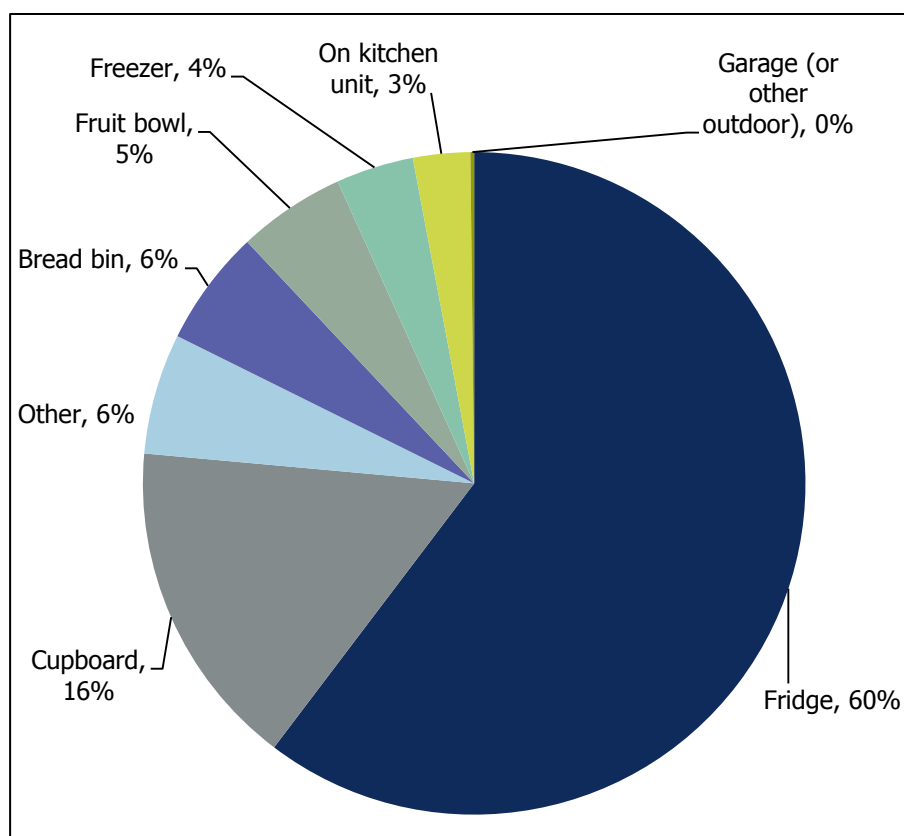
4.5 Storage behaviours

Poor or inappropriate storage practices, both in terms of where food is stored and how, were identified in the literature review as a factor in driving household food waste (see section 2). The kitchen diary was designed to capture information about how and where food was stored, as well as the importance of storage-related reasoning (e.g. 'It was open too long') in disposal decisions. The data were explored for possible connections between where food items were stored and the reasons why they were thrown away.

4.5.1 Where items were stored

From a base of 2,190 food items where storage location was recorded, most of the items that were thrown away over the two-week research period had been stored in a fridge (60%), followed by a smaller number stored in a cupboard (16%). Figure 8 below shows all storage locations recorded in the kitchen diaries.

Figure 8 Where food items were reported stored, n=2,190



Figures 9 and 10 provide a breakdown of the five largest food categories for items reported to have been stored in a fridge or in a cupboard. For storage in a fridge, "Fresh vegetables" are by far the largest product category, whereas for cupboard storage "Bread and pastries" are the largest category. However, "Fresh vegetables" make up a substantial proportion of food items reported stored in a cupboard.

Figure 9 Selected products reported stored in the fridge, n=1,321

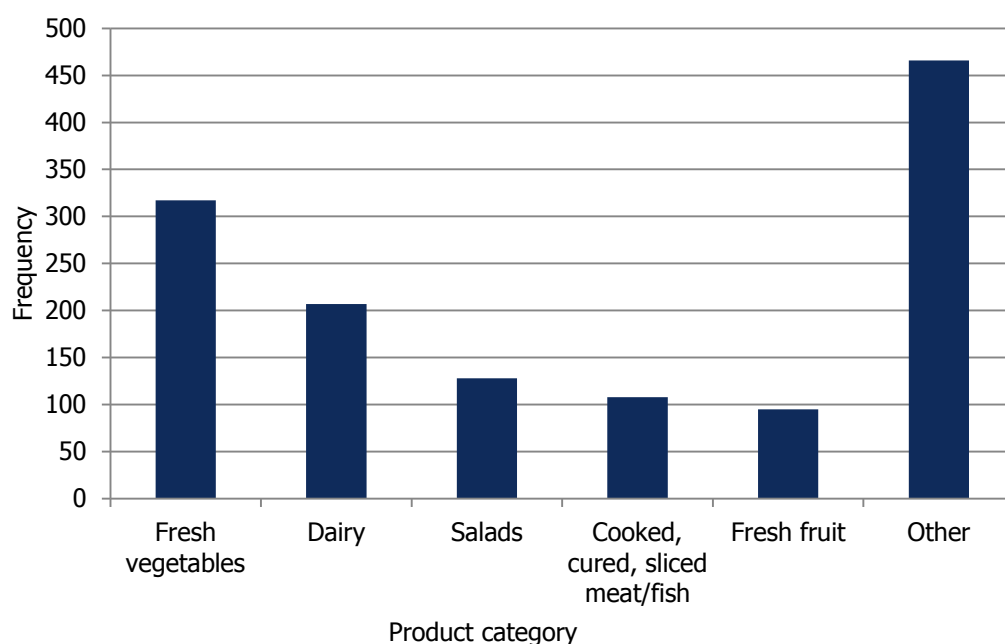
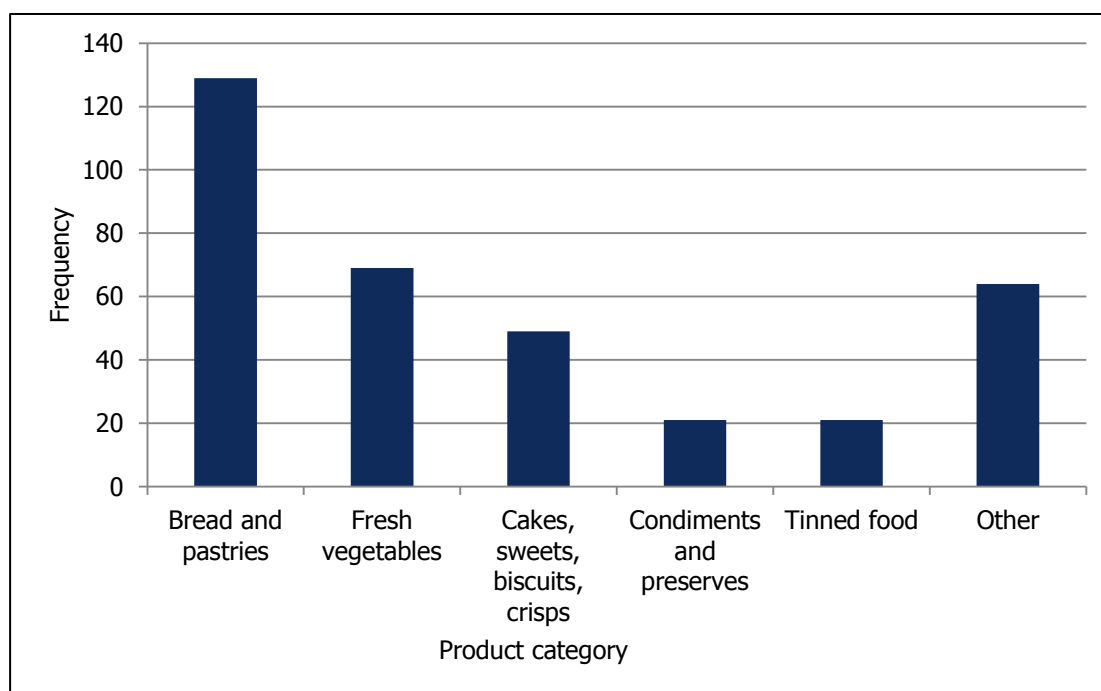


Figure 10 Selected products reported stored in a cupboard, n=353



Differences in reasons for throwing away food stored in the fridge or a cupboard

When items were stored in the fridge they were more likely to be thrown away because they looked or smelt off.

Figure 11 shows the reasons given for throwing away the 1,321 items that were reported as stored in the fridge, and Figure 12 shows the reasons for the 353 items reported as stored in a cupboard. The response 'It was after the date on the label' was given least often for both storage locations, markedly so for items stored in the fridge but with little to distinguish this reason from the others in the case of storage in a cupboard.

Figure 11 Reasons given for throwing away products reported stored in the fridge, n=1,321

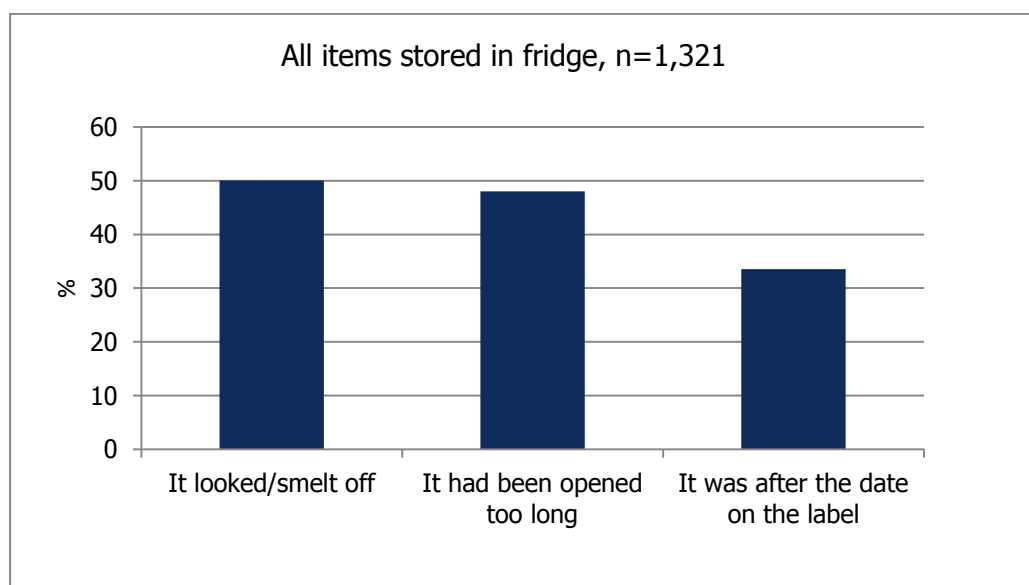
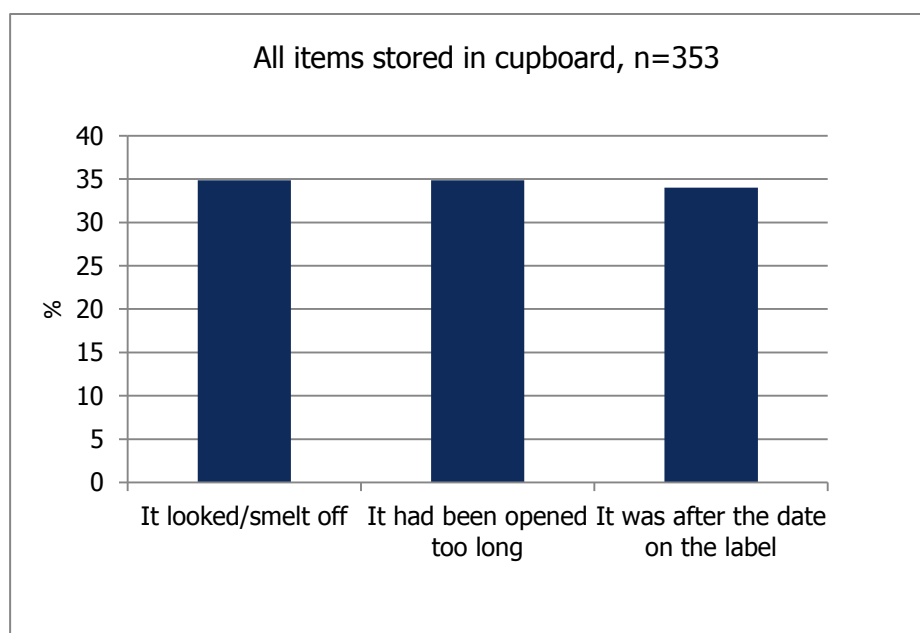


Figure 12 Reasons given for throwing away products reported stored in a cupboard, n=353



Implications of storage location

A high proportion of items which ended up being thrown away had been stored in the fridge. Food thrown away that had been stored in the fridge was more likely to be judged to look/smell off, but the importance of the date label in disposal decisions was the same for food that had been stored in the fridge and in the cupboard.

4.5.2 How items were stored

From a base of 2,180 food items where a response to 'How was it stored?' was recorded, 1,478 (68%) were reported as having been stored in their original packaging. Ninety-two per cent of "Dairy" were stored in their original packaging. This figure is 89% for "Bread and pastries" and 56% for "Fresh vegetables". Thirty two per cent of the food items thrown away did not have a date label or storage guidance since they had been removed from their original packaging or bought loose.

Out of a total of 290 loosely stored items (13% of base of 2,180), the majority were made up of two categories, "Fresh vegetables" (which comprised 50% of loosely stored items) and "Fresh fruit" (which comprised 35%).

Looking at this issue from the perspective of the most common food categories reveals that 33% of "Fresh vegetables" are stored loose, with an additional 3% stored on a plate or bowl. For the "Fresh fruit" category, 37% is stored loose (of which 23% were stored in the fridge and 8% in a cupboard) and a further 31% is stored on a plate or bowl (of which 11% were stored in the fridge and 1% in a cupboard).

4.5.3 Exploration of reasons for throwing food away when linked to how items were stored

For loose items, the implication is that sensory judgement was used in the majority of cases, which is consistent with the finding that they are predominantly fresh vegetables or fruit. For items stored in their original packaging, the reasons are evenly distributed (note that participants could score multiple reasons as important).

Figure 13 below shows that for items stored in their original packaging there is a fairly even division between the three main reasons for disposal used in this study. However, where items were stored loose, shown in Figure 14, the majority were reported as looking or smelling off, far fewer because they had been open too long and fewer still because they were after the date on the label.

Figure 13 Reasons given for throwing away products that were stored in their original packaging, n=1,478

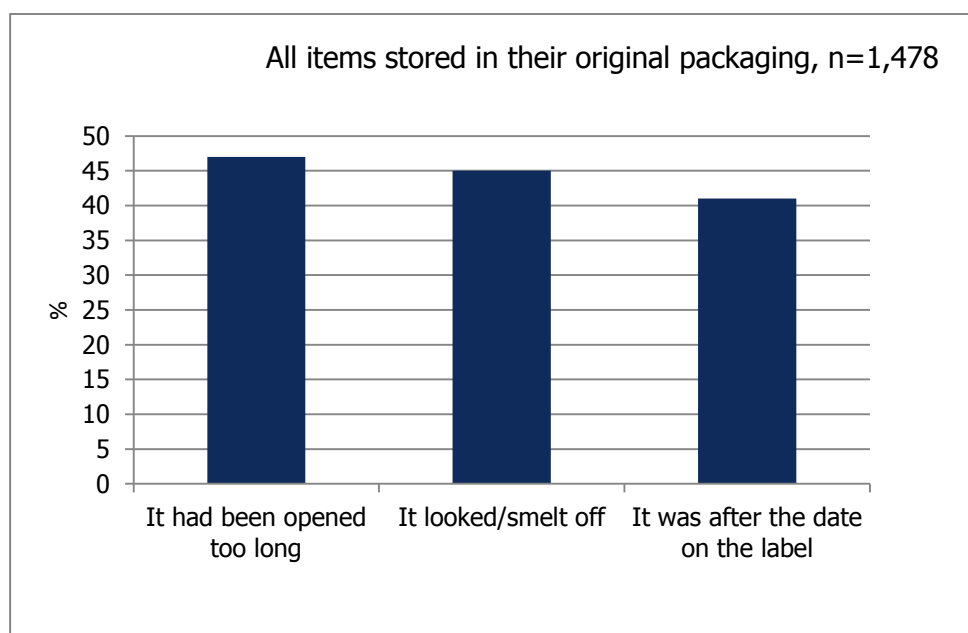
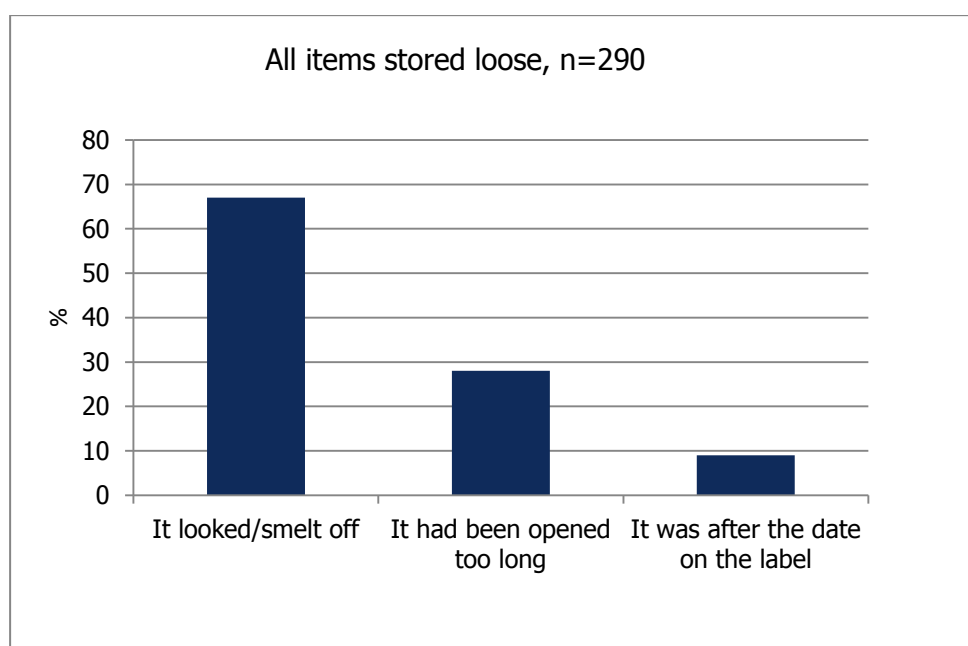


Figure 14 Reasons given for throwing away products that were stored loose, n=290



As expected, date labels and storage guidance do not appear to be relevant for items that had been stored loose. The data indicate that for items recorded with 'It was after the date on the label' or 'It had been opened too long', only a small minority (4% and 8%) had been stored loose. This could indicate that 'It was past the date on the label' was being used by a small minority as a generic term for food that was 'off'.

Implications of storage method

The data indicate that most food items, which are thrown away, have been stored in their original packaging, although a significant amount of food that is thrown away (32%) has been stored out of its packaging. This suggests that in around two thirds of cases, there may be scope for labelling changes to make a difference. The products most likely to be stored in their original packaging - and therefore for on-pack labelling to be present - were "Dairy" and "Bread and pastries". Least likely were "Fresh fruit and vegetables".

4.6 When items were thrown away

The kitchen diary set out to investigate the key moments that date labels and storage guidance are used at various stages in the 'food journey', from pre shopping, to shopping, to at home when storing, managing and using food. Multiple responses were allowed in response to the question shown in Figure 15; 2,189 single responses were given and 32 additional responses. Table 11 shows when food was most likely to be thrown away.

Figure 15 Extract from the kitchen diary: decision point

7. When did you decide to throw it out?

☐ Around meal-time (preparation, cooking)

☐ When putting things away after shopping

☐ When having a snack

☐ Clearing out the cupboards/ fridge/freezer

☐ Checking the cupboards before shopping

☐ Noticed it while doing/looking for something else

☐ Other, please specify:

Table 11 Decision points when food was thrown away (n=2,221 diary entries)

Decision point	Frequency	%
Around meal-time (preparation, cooking)	653	29%
Clearing out the cupboards/fridge/freezer	379	17%
Noticed it while doing/looking for something else	351	16%
When putting things away after shopping	300	14%
When having a snack	247	11%
Other	159	7%
Checking the cupboards before shopping	132	6%

NB: it was possible to provide more than one response to this question.

Patterns in the division of disposal points

The diary data show that the largest proportion of food is thrown away at the eat/dispose decision point - together, mealtimes and snacks account for 40% of the waste. Shopping-related decision points (pre-shop stock check and post-shop unpacking) make up a further 20%. The remaining disposal decisions seem to take place at ad hoc moments (16%) or during clear-outs (17%).

Lack of correlation between disposal points and different reasons for disposal

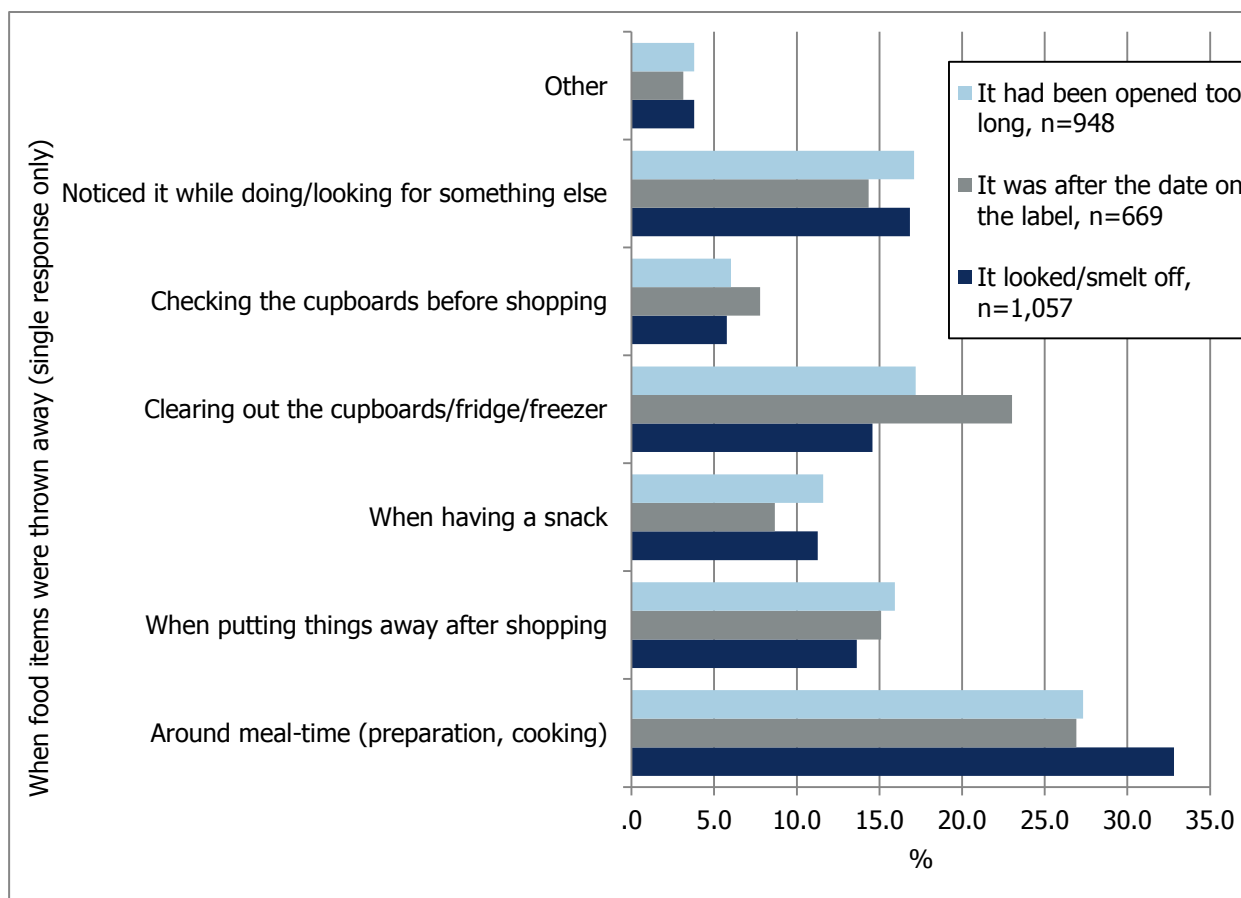
In order to gain an insight into the use of date labels and storage guidance, the different stages at which food products were thrown away were compared with the reasons given for throwing them away. Analysis revealed that the distribution of throwing away points varied very little when the data set was limited to entries where either 'It looked/smelt off', 'It was after the date on the label' or 'It had been opened too long' were rated as important.

Figure 16 shows the single response answers for each of the three reasons why the food was thrown away, and indicates two slight deviations:

- Items thrown away because of the date on the label were slightly more likely to be thrown away when clearing out than items thrown away for other reasons.

- Items thrown away because they looked or smelt off were slightly more likely to be thrown away around meal times than for items thrown away for other reasons.

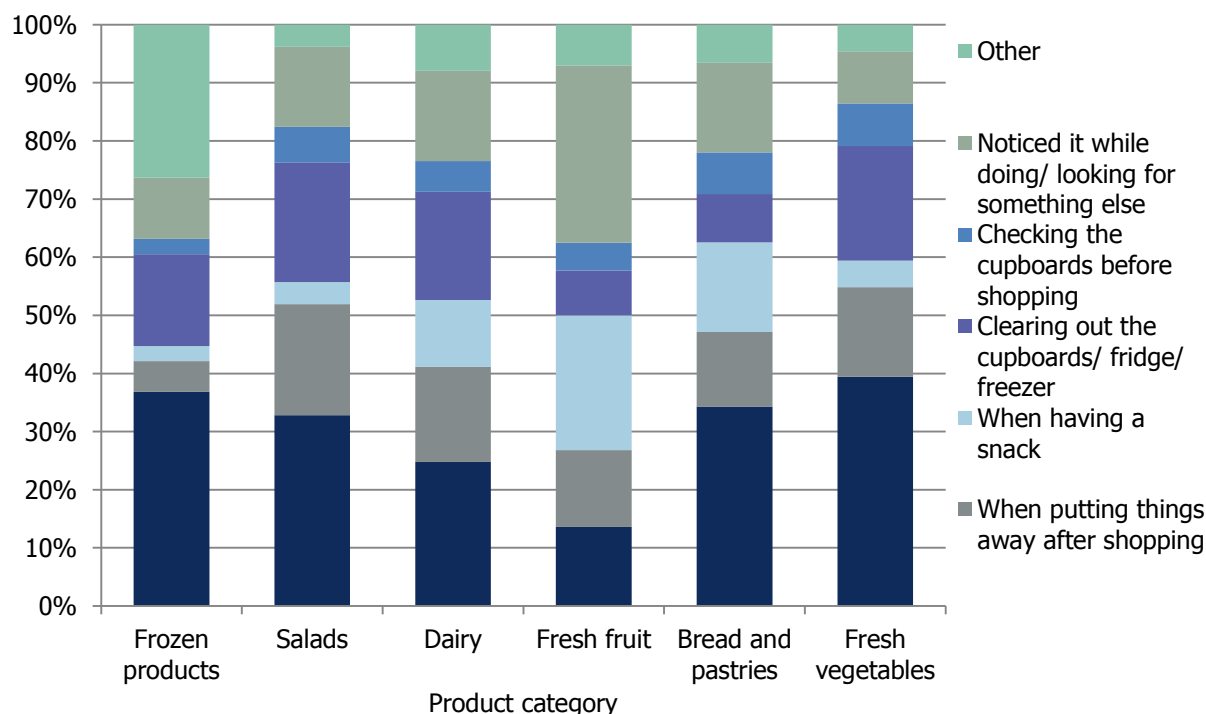
Figure 16 When food items were thrown away for different reasons why



Variations in disposal point between product categories

Figure 17 shows the key disposal decision points for different product categories, with some clear differences.

Figure 17 Disposal decision points for different product categories



It is notable that:

- While “Salads and fresh vegetables” are most likely to be thrown out ‘Around mealtimes’, “Fresh fruit” is more likely to be thrown out whilst ‘Looking for something else’ or ‘Having a snack’.
- “Salads” are the product most likely to be thrown away while ‘Unpacking shopping’.
- Checking the cupboards before shopping is not a common moment when people throw food away. This may be linked to the finding of the depth interviews and accompanied shops that most people do not physically check the cupboards before shopping, but rather keep a running mental inventory of what they have in their cupboards (this contrasts to the baseline questionnaire findings, in which people claimed to check their cupboards, but the depth interviews suggested that many people counted their running mental inventory or on-going list of products that had run out as ‘checking the cupboards’).

4.7 Links between food attitudes and behaviours and waste outcomes

As set out in section 3, five behavioural themes were identified which were hypothesised to relate to date label and storage guidance use and understanding. All respondents were clustered according to each of these five themes.

Table 11 lists the cluster groups and the average number of items thrown away by households in each cluster, as derived from the diary data. Recalling that for all 168 diary respondents the average number of food items thrown away over the two week period was 13.3, Table 12 shows the average numbers of items thrown away for each cluster. It suggests that different food attitudes and behaviours are linked to different amounts of waste (particularly themes 4 and 5).

As discussed in more detail in section 3, the clustering approach with a sample of this size provides **indicative results**. The figures in this table should thus be treated with care.

Table 12 The average number of food items thrown away by cluster

Attitude/behaviour theme ²⁰	Cluster name (% questionnaire respondents)	Average food items thrown away
1 - Reported date label behaviours	Date driven (39%)	14.3
	Date savvy (49%)*	12.0
	Date disengaged (13%)*	11.6
2 - Reported storage guidance behaviours	Storage guidance agnostic (48%)	13.6
	Storage guidance aware (52%)	11.7
3 - Attitudes to food risk	Confident judges (42%)	11.4
	Safety sensitive (58%)	13.9
4 - Food management behaviours	Leftover leavers (34%)	15.3
	Fridge foragers (67%)	11.6
5 - Shopping and stock management behaviours	Cupboard monitors / list makers (65%)	11.3
	Spontaneous shoppers (35%)	15.5

* These two clusters can be combined to form a single cluster named 'date savvy/disengaged', making up 61% of the total, with an average number of food items thrown away of 11.9.

Key highlights

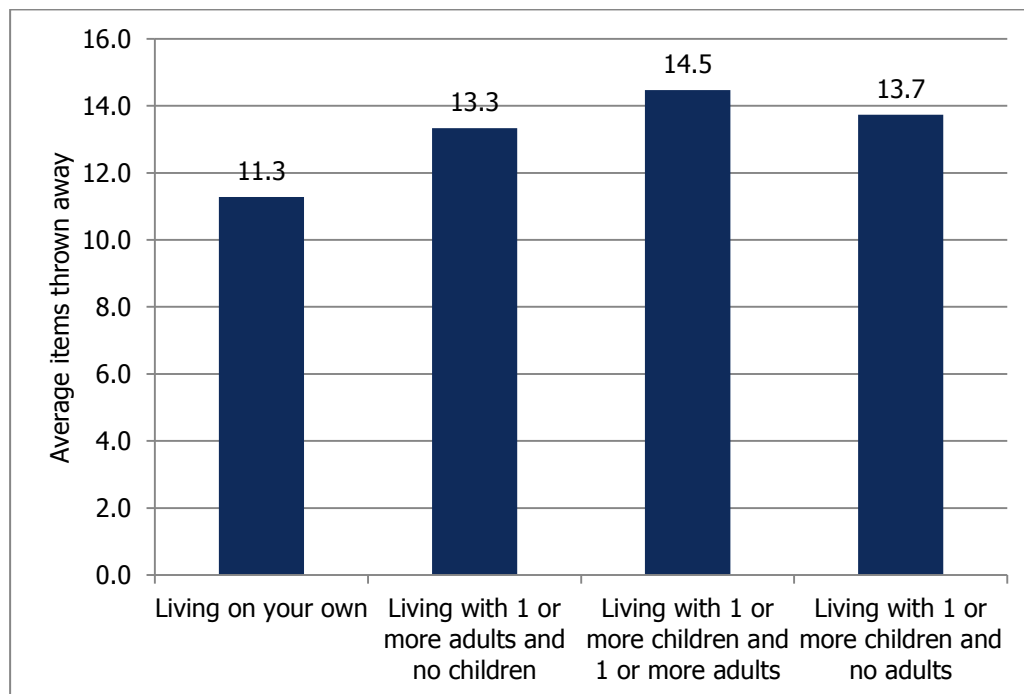
- Participants who were identified as 'date driven' threw away more food items, on average.
- The 'storage guidance aware' - tended to throw away less food.
- Those who were 'safety sensitive' threw away more food items on average than those who were 'confident judges'.
- Consumers who manage food well – 'fridge foragers' - who engage in behaviours such as using leftovers, using food near or past its best or freezing food, threw away 24% fewer items than those in the 'leftover leavers' cluster.
- Where participants planned more, they wasted less food - participants who planned their shopping, made a list and monitored what food they had at home wasted less food than 'spontaneous shoppers'.

²⁰ Note that the entire sample was clustered for each theme – the themes are not mutually exclusive.

4.8 Household composition and food waste outcomes

The number of food items thrown away over the two week kitchen diary period may be a function of household composition. Figure 18 shows the relationship between household type and the average number of food items thrown away for the whole kitchen diary sample. As expected, larger households reported throwing away more food items on average than smaller ones.

Figure 18 Average number of items thrown away per person by household composition, n=167



Examining the household composition of the clusters reveals little difference between the clusters. Although the sample sizes are small, and further investigation is warranted, this finding suggests that variation in the number of food items thrown away between clusters is indeed a function of attitudes and/or behaviours rather than the composition of the clusters.

4.9 Connections between date label usage and other food attitudes and behaviours

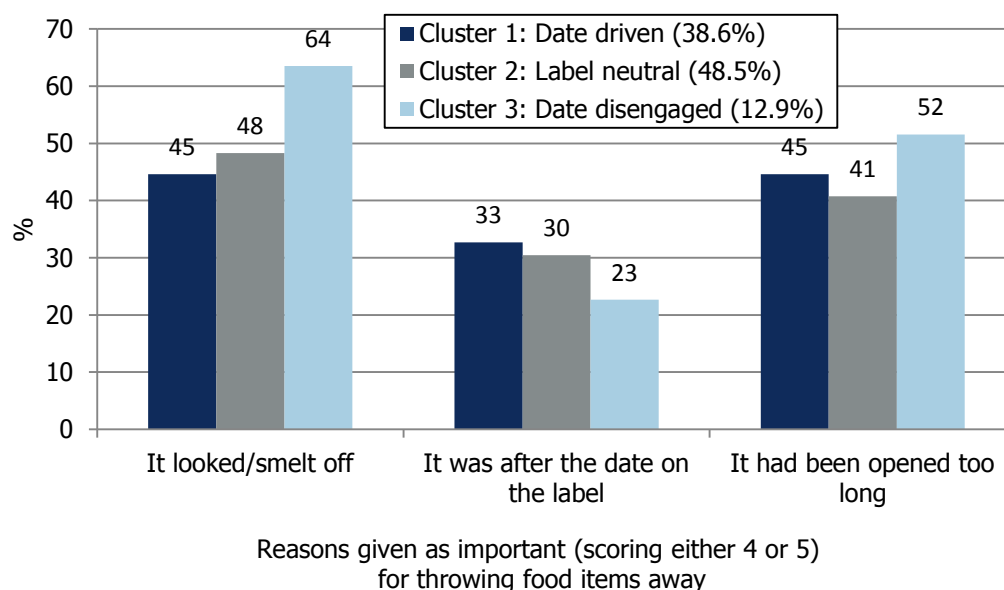
In order to deepen our understanding of how date labels are used, the links between the attitude and behaviour sets devised for the cluster analysis and when food was disposed of relative to the date on the label were explored.

At this level of disaggregation, however, the findings are necessarily very tentative, but seem to suggest:

- Those who used date labels the least, the 'date disengaged', generally threw food away later than members of the 'date driven' cluster.
- Reported use of storage guidance did not strongly influence the dates that items were thrown away relative to the date on the label.
- Attitude to food risk made a difference to when food was thrown away, relative to the date on the label: members of the 'safety sensitive' cluster appear to throw food items away earlier than the less cautious 'confident judges'.
- Participants who generally claim not to use leftovers or food that is near or past its best (leftover leavers), tended to throw food items away earlier than those who are more willing to use up food that they have in stock at home (fridge foragers).

The most pronounced differences occurred within the date labels behaviour theme. Figure 19 shows the relative frequency of reasons for disposal given by members of the three clusters in the 'reported date label behaviours' theme. The chart shows that there is a relationship between lower engagement with date labels and a higher propensity to use one's own judgement ('It looked/smelt off'). The 'date driven' group were most likely to cite the date label as an important reason for throwing away food, but even for this group, 'It looked/smelt off' and 'It had been open too long' were more frequently cited as important reasons for disposal.

Figure 19 Reasons given by members of each cluster for the 'reported date label behaviours' theme



4.10 Summary

In total, 180 diaries were distributed and 168 completed diaries were returned for analysis. The total number of reported food waste items was 2,227, giving an average number of avoidable food waste items of 13.3 per household over the 14 day research period. The maximum number in any diary was 41 items and the minimum was zero.

Thirty-two per cent of the food thrown away over the two week period was not in any packaging – the product either having been removed from its original packaging or purchased loose. In other words, no date label or storage guidance was present in around a third of disposal decisions.

The most common reason for food being thrown away was that 'It looked/smelt off' (47% of diary entries). The date label was rated as an important reason for disposal in 30% of cases (being the 4th most rated reason overall).

Products carrying a 'best before' date tended to be thrown away after the date on the label. However, an increase in entries one day after the date on the label suggests that some consumers may be incorrectly interpreting 'best before' dates as 'use by' dates rather than as quality guidelines.

Just under 12% of items carrying a 'use by' date were thrown away on the date on the label. This suggests that some people may not realise that the 'use by' date means that food should be used by the end (i.e. midnight) of the day indicated on the label, or that they are treating the date as a 'buffer'.

The data suggest that around 4 in 10 disposal decisions occur at the moment of deciding whether to eat the food (i.e. at mealtime or when snacking).

Participants identified as 'date driven' threw away more food items, on average, than those who paid little or no attention to dates.

Those who were more risk averse ('safety sensitive') threw away more food items on average than those who were more confident about eating food which wasn't necessarily at its best ('confident judges'). The 'safety sensitive' participants were more likely to throw away food items due to the date on the label and less likely to throw items away after making a sensory judgement.

Respondents from the 'storage guidance aware' cluster, who claimed to follow storage guidance the most, threw away fewer items on average than those who were less engaged with storage guidance.

'Fridge foragers' who managed food and used leftovers made fewer diary entries than those who did not ('leftover leavers'). 'Fridge foragers' threw food away more often because 'It looked or smelt off', and less often because 'It was past the date on the label'.

Participants who made shopping lists and monitored their cupboards, made fewer diary entries. Those who shopped spontaneously, only rarely planned what they were going to buy, didn't use a list or check their cupboards before shopping wasted more food. Those more likely to be 'cupboard monitors / list makers', were more likely to throw food items away due to the date on the label and on account of personal preference ('I didn't like/want to eat it').

Examining the household composition of the clusters reveals little difference between the clusters. Although the sample sizes are small, and further investigation is warranted, this finding suggests that variation in the number of food items thrown away between clusters is indeed a function of attitudes and/or behaviours rather than the composition of the clusters.

5.0 Findings of the depth and telephone interviews

This section contains a summary of 35 in-home, face-to-face 'depth' interviews and 34 telephone interviews, conducted with participants as a follow up to the kitchen diary exercise. The overarching aim of these interviews was to qualitatively explore how date labels and storage guidance are understood, interpreted and used by consumers and the implications of this for household food waste.

5.1 Introduction

As outlined in section 4, 180 participants in three locations were recruited to complete kitchen diaries over a two week period. From this sample, 35 people (12 from each of the three locations) were pre-selected to participate in a follow-up depth interview in their homes. These 35 participants represented a range of age groups, household types, and socio-economic groups (see appendix 1 for the recruitment criteria).

The aim of the depth interviews (see appendix 4) was to develop a rich, qualitative picture of understanding, interpretation and use of date labels and storage guidance. In order to do this, each interview was structured around the participant's kitchen diary, which was used as a memory prompt and as a basis for in-depth questioning.

The topic guide for the interviews built on insight from the literature review, which suggested that food behaviour, including use of date labels and storage guidance, is often subconscious, habitual and subject to a number of social and psychological influences. These factors mean that food behaviours may not be entirely accessible to the recall of participants, and directly questioning research participants about their behaviour outside the context of the shop or the kitchen may not give an accurate picture.

For these reasons, the interviews were designed to build on the kitchen diaries, which contain information recorded at the moment when food decisions were being made. The topic guide was designed first and foremost to *elicit* information from participants, rather than asking direct questions about understanding and use of date labels and storage guidance. The key device used in the interviews was to invite participants to construct detailed 'narratives' around selected diary entries. The aim of these narratives was to ascertain the unprompted salience or importance of date labels and storage guidance within the 'stories' about food-related decision-making. Once the 'narratives' section of the interview was complete, detailed questions relating to specific research questions were explored more directly with participants.

In addition to the 35 depth interviews, 34 follow-up telephone interviews were conducted with randomly selected diarists. The aims of these interviews were (a) to ask participants a small number of in-depth questions about their kitchen diaries; (b) to feed into the development of the depth interview topic guide; and (c) to maximise the quality of the diary data (experience shows that data quality is higher where participants are expecting a follow-up interview). (See appendix 5 for the topic guide).

5.2 Consumer understanding of date labels

One of the aims of the depth and telephone interviews was to gain qualitative insight into consumer understanding of the different types of date label, given the often ambiguous picture presented by the literature review and baseline survey evidence (see sections 2 and 3). This information was gathered from participants in a number of ways: through analysis of food diary narratives for references to date labels; by asking broad questions about whether participants noticed different types of date label and what they thought they meant; and through specific probing around the different labels if participants failed to mention them unprompted.

Overall, 27 of the 69 interviewees²¹ *correctly* distinguished between and defined 'use by', 'best before' and 'display until' dates. This implies that the majority of participants (roughly six out of every ten) did not fully understand the labelling system.

Various themes emerged from the incorrect definitions given. The most common was a failure to distinguish between any of the different date labels. Some participants seemed to be aware that there might be a difference, but ignored it, claiming to treat all dates the same:

M: I kind of treat them all as the same day. I suppose 'best before' and 'use by', 'best before' does imply that it is still OK to eat after the date. 'Use by' would suggest that it is probably not... that is just what the words imply to me, yes, but I kind of treat all the dates as the same really, I don't, I just see

²¹ 13 of the 35 depths and 14 of the 34 telephone interviewees.

the date and then that is it. If it says 'use by' I wouldn't treat it any differently if it said 'best before' or 'display until'.

Q: And what if there are two different dates on something?

M: I would go with the latest one.

MALE, 27, C1, NOTTINGHAM

In one extreme case, a participant reported treating the 'display until' date as a strict 'use by' date, although this behaviour was not common:

M: I know there is sometimes a difference with 'use by' or 'sell by' or display date as opposed to 'use by', but we, I think we use every date as a use it by date

Q: So if there were two dates, a display date and a 'use by' date say, which date would you go by?

M: The earlier one.

Q: The earlier one?

M: Definitely, very strict on that. Yes, err on the side of caution, go for the first date.

MALE, 56, B, COVENTRY

Other participants were genuinely confused about the meaning of the different labels, not only defining them incorrectly, but mixing up retailer and consumer facing dates:

W: So yes, 'best before', maybe when the shop should ideally like sold it by and then it gives you a few days grace to then use it by. So it should ideally be used by the 'use by' date before it, like I say, might not be as nice.

FEMALE, 25, C2, COVENTRY

Some participants, while correctly identifying 'display until' dates as retailer stock control information, failed to correctly distinguish between the consumer facing dates:

Q: So what is the difference to you between 'use by' and the 'best before' date?

W: Well 'best before' is that you should eat it that day shouldn't you, best before, before that date.

Q: And 'use by'?

W: 'Use by' is to use on that day but I suppose if you don't use it on that day I've seen people, I've gone to people's houses and they've had it two days in the fridge. I think if it's in a fridge it's not so bad.

FEMALE, 60, D, SOMERSET

The language that some participants used also suggested that they conflated 'best before' and 'use by' dates:

W: Oh yes, ate a couple of days before 'best by' years ago and was ill, yes.

FEMALE, 37, A, SOMERSET

Similarly, one participant talked throughout the interview about how date labels were 'phrased', without seeming to realise that the different wordings signified different types of guideline.

Overall, the majority of interviewees were not able to give correct and precise definitions of the different date labels, even when prompted and given the space to reflect on the matter. This demonstrates that there is a genuine and widespread lack of understanding about what the different date labels mean.

5.3 When and how are date labels used?

During the depth and telephone interviews, participants were probed for detailed information about when – at which food decision points – they referred to date labels and how date labels were used in decision-making. This section details some of the themes that emerged from the interviews that shed more light on how date labels are interpreted and used in purchasing and in-home consumption decisions.

5.3.1 In-store: buying the freshest product

In both the telephone and depth interviews, a majority of participants reported that they refer to date labels as they shop. Some participants commented that they sometimes look for reduced items which are near their date. However, the main reported use of date labels in-store was to aid selection of the freshest or 'best' product. This reported use of date labels in-store is reflected in the baseline questionnaire, which showed that three quarters of participants reported referring to date labels in-store 'always' (41%) or 'most of the time' (34%) (see section 3).

Various participants reported always picking up products from the back of the shelf, as they claimed to be aware of store stock-rotation practices which put the newest or freshest products at the back:

W: It annoys me to think that you're buying something that's out of date the next day, you know, or it hasn't got a very long shelf-life ... I always go to the back to make sure that I've got the longest date on there.

FEMALE, 41, E, COVENTRY

Participants often reported this 'savvy' shopping behaviour with pride, along with annoyance that supermarkets might try to sell them less-than-fresh items. Some participants commented that date labels were an effective accountability mechanism that prevented supermarkets putting 'old' food on the shelves.

Participants often singled out particular products for which they felt it was most important to check the date in-store, and a variety of motivations emerged among different people and across different product types. Examples include:

- Bagged salad - desire to minimise a well-known personal source of food waste.
- Meat - desire to avoid wasting money and to have as long as possible to use it up.
- Milk and bread - preference for these 'daily' products to be as fresh as possible.

Reference to date labels also occurred in the context of online shopping, with some participants claiming that online orders often included items that were near to their date. One participant reported that she specifically requested products with the longest date when she shopped online.

5.3.2 At home: disposal decisions

Almost all interviewees reported that they made some use of date labels at home. The key decision point at which dates were most frequently used was the moment of deciding whether to eat or dispose of food. It was relatively rare for participants to report using dates for on-going food management, such as when planning a shop, unpacking shopping, deciding whether something could be frozen to prolong its life (see below for more on freezing decision), or deciding the order in which food should be eaten:

W: Once I have sort of bought it then I sort of store in my head like when I think it needs to be used by and I don't really look at the dates of stuff once I have got them.

FEMALE, 25, C2, COVENTRY

Although most participants reported making use of date labels at home in their disposal decisions, there was wide variation across individuals in the extent to which date labels were used. A minority of participants exhibited behaviour at the extremes of the spectrum – either relying almost exclusively on dates in their eat/dispose decisions, or ignoring them entirely.

Heavy reliance on dates:

W: I always use date labels and it's like I remember that that's the 9th. On bread I always use date labels and I would never eat it if it's past that date.

Q: And what about on other stuff?

W: *Anything yes. I'm funny as well using it on the date that it says it's going to go out of date.*

FEMALE, 32, B, COVENTRY

Minimal reference to dates:

M: *I mean if it looks all right, it smells all right, irrespective of the sell by date we eat it... Very seldom look at dates.*

MALE, 69, C2, NOTTINGHAM

Most participants' behaviour patterns lay somewhere in between these two extremes, with the majority often using date labels in conjunction with various other factors to make disposal decisions. The importance of date labels within individual decision-making processes not only varied by person, but also by product type, as well as by a number of contextual factors (outlined below).

5.3.3 Use of date labels: product type vs. date type

At the extreme ends of the spectrum, participants tended to approach dates with a single, blanket rule – either strictly adhering to any and all dates, or completely ignoring them. For most participants, however, interpretation and use of date labels varied according to product type. In general, in the context of eat/dispose decisions, participants reported paying most attention to date labels on fresh meat and dairy products – particularly yoghurts – and least attention in the case of fruit, vegetables, bread and cereals. Overall, participants tended to rely more on date labels where safety was concerned, and more on their own judgement with 'low risk' foods where the primary concern was quality. Concern with food safety was sometimes linked to past experiences of becoming ill:

W: *I think once I ate a yogurt that was a day off its 'best before' date and I was really poorly, I had to have two days off work and that was probably about 10 years ago and it has stuck with me.*

FEMALE, 37, A, SOMERSET

However, it was often founded in more general risk aversion around food, not linked to any particular incident. Risk aversion or concern for food safety – and therefore strictness around date labels – was often amplified with regard to children or the elderly, even among those who claimed to be relaxed about the food they ate themselves:

M: *It depends on who is eating it, my brothers don't eat anything because of the kids, and if there was children involved I would take no chances. Take chances myself.*

MALE, 45, E, NOTTINGHAM

There was variation within product categories in terms of participants' perceived levels of risk and their confidence in their own ability to make judgements. For example, some participants singled out eggs as an example of a product about which they were particularly cautious, whereas others specified eggs as a product for which their own judgement or techniques (e.g. cracking it open or floating the egg in water) were trusted over and above the date label. Other products where there was particular variation in perceptions of risk (and therefore in the extent to which date labels were relied upon) included cheese, cooked meats and milk.

5.3.4 Quality and the desire to eat the best and freshest products

One noteworthy variation in approach was in the case of bread. While most people felt able to use their own judgement with bread, use of date labels varied for other reasons. Most people cited bread as a product for which they would rely on their own judgement over the date label. However, a significant minority disregarded their own judgement in favour of the date label, not for reasons of risk aversion, but due to a desire to eat only the freshest, most recently made bread. In some cases, bread disposal decisions were based on neither judgement nor date labels, but uneaten bread was simply replaced as a matter of course with fresh bread on shopping day:

W: *I went shopping on that Saturday and bought some bread and came back and thought, oh I've already got a loaf, but it had been opened and I thought oh it's gone out of date tomorrow anyway so I'll just throw it away.*

FEMALE, 32, B, COVENTRY

In some cases, this desire for the freshest or best food was not confined to one or two products, but constituted a general approach to food:

M: Lettuce is something I think will quickly look less than beautiful, and even if it is perfectly safe, if it doesn't look right my wife is, it has gone, get rid of that. Fruit itself, again a lot of oranges and kiwi fruit as you can see.

Q: Yes, a lovely little fruit bowl.

M: I don't eat fruit hardly at all, but again with those it won't be long before she decides the oranges are past their best and they will go. Even if they are perfectly safe to eat and that, you know, we are a little bit naughty where that is concerned to be honest.

MALE, 56, B, COVENTRY

5.3.5 Confidence in ability to use own judgement

The majority of participants valued date labels most in cases where they were least confident in their ability to judge either risk or quality for themselves. Perceived ability to judge whether food was ok to eat was often related to product type and confidence in using their own senses - yoghurt and meat were often cited as examples in this category. In other cases, confidence in ability to judge was related to the nature of the product – for example, ready meals that are cooked inside a package with a film lid, preventing sensory inspection:

W: [Foods that are] microwaved before you undo them ... you've got no judgement with that at all. You need to be guided by the date, so perhaps sealed things that you know you can't smell or that are covered in sauces and things like that, it's difficult to judge.

FEMALE, 45, C1, SOMERSET

5.3.6 'Buffers' and margins around dates

A small minority of the most risk averse, date-label-dependent participants claimed to prefer to leave a buffer of one day *before* the date on the label, just to be on the safe side of any perceived quality or safety risk. It was more common, however, for participants to report leaving margins *after* the date on the label, within which they would be happy to eat the product. This again varied with the general risk sensitivity of the participant, as well as with product type. No participants reported that the size of the margin was informed by the type of date label on the product.

As outlined above, the date on the label was most likely to be interpreted strictly with 'high risk' products such as fresh meat and fish. Taking fresh meat as an example, most participants said that they would throw this product away on the date on the label, although a smaller number said that they would eat fresh meat up to one or two days after the date on the label, as long as it looked and smelt okay. Margins around date labels again depended heavily on product type, with the size of the margin again linked to the perceived risk of the product. Most people had their own product-specific rules of thumb about how long after the date label they were willing to eat different food types:

W: Tend to have quite a high turnover of milk, so, but if it was past the date, usually we don't keep milk past the date, we would use it within anyway, but I probably would get rid of it if it was. Again like yogurts, probably have them like a week out of date and you know would use it. But if it was like excessive then no I wouldn't keep it like too long. But a few days I would.

FEMALE, 25, C2, COVENTRY

5.3.7 General attitude to food and food labels

Some participants suggested that the approach to date labels was often a personal, idiosyncratic trait that was linked to more general food practices and often represented simply 'the way people are':

W: I think you are either a person that reads the labels and sort of takes notice of it, or people that are just you know ... I don't know if you could actually change it to make it any better, because I think you are either one way or the other anyway.

FEMALE, 35, C1, COVENTRY

5.3.8 Contextual factors and mood

Many interviewees reported that their interpretation of date labels was influenced by contextual factors. For example, some participants reported that the decision to use or throw away a particular food item that was past its best (including items past their 'best before' date) sometimes depended on whether they had an alternative in the house or if that was their only option. Similarly, moods and cravings sometimes overrode participants' standard approach to date labels. One participant described how she normally uses up vegetables that are past their best by making a soup. Occasionally, however, she will look in the bottom of her fridge and 'feel disgusted' and just throw them all out. Another participant reported that, despite normally checking dates carefully, his desire to eat something could overshadow his customary caution:

Q: How much do you think you pay attention to the dates on food?

M: It depends what it is. If it is something I really want to eat, if it was a cake I would eat it, if it is vegetables they are out.

MALE, 27, C1, NOTTINGHAM

In summary, both the depth and telephone interviews suggested that, except at the extreme ends of the spectrum, the majority of people's approach to using date labels is not fixed, but fluid and dynamic. Most participants had developed product-specific rules of thumb around use of date labels that were strongly linked to perceived safety risk and, to a lesser extent, perceived quality risk: interpretation and use of food dates was often determined more by *product type* than *date label type*. This in turn overlapped with their perceived ability to judge for themselves. However, these rules of thumb were largely flexible, and could be overridden by day-to-day changes in circumstance, situation, or even mood.

5.4 The links between understanding, use of date labels and food waste

5.4.1 Links between understanding and behaviour

Responses to the baseline questionnaire completed by participants prior to the diary exercise suggested that there was a difference between knowledge of the technical definition of date labels and people's own working definitions (see section 3). The depth and telephone interviews aimed to gain some clarity on the extent of technical understanding and how this related to practical interpretation and application of dates.

The interviews suggested that most people's working definitions and rules of thumb around date labels were deeply embedded in, and informed by, their wider food practices. Date labels were generally used as one complementary part of decision-making processes, in conjunction with other considerations; and the approach to date labels was usually informed by a variety of more general factors. For example:

- General risk aversion around food often led to a more cautious approach to using date labels, including, for example, using a 'best before' date as a strict cut-off point, regardless of technical understanding of the label.
- Some participants with large families reported that their high food turnover meant that date labels were much less relevant to them – for example, one participant with five children never looked at date labels on bread, since she used a full loaf every day.
- Some participants who shopped frequently at local shops, such as butchers and greengrocers, were accustomed to making food decisions in the absence of date labels, and tended to rely on them less overall.

The technical definition of the date labels (for example, the difference between 'best before' and 'use by' dates) was frequently of less relevance to participants than these other factors: participants' responses to questions around how they understood date labels were generally based in these 'practical' interpretations they had developed to fit in with their overall food practices, rather than in the technical definitions of the labels.

Correct understanding of the labelling system was not necessarily linked to correct use of labels – for example, some participants who understood the definition of a 'use by' date still reported using their own judgement to make decisions, rather than relying on the date. Similarly, despite being told the definitions of the different labels, it was common for participants to state this new knowledge would not change their behaviour:

W: It's not good to throw things away because it is a waste of money, I understand that, but the 'best before' date thing, I can't budge on that one.

FEMALE, 32, B, COVENTRY

It seems, therefore, that the connection between understanding and behaviour around date labels is complex and multi-directional: *behaviour* influences interpretation and 'understanding', as much as, if not more than,

understanding influences behaviour. As a consequence, it is unclear whether, and how, improving understanding of date labels would influence how they are used.

5.4.2 Trust in date labels

Most participants reported making some reference to date labels in their food decision-making. At the same time, however, scepticism about dates was common, even among those who tended to rely on them most:

M: I, it's funny, I'm as cynical as I am gullible in that I sort of, I want to think that the 'use by' dates are sort of like the food will go off on this day, don't use it after it might be a bit funny, but I do think at the same time, the cynical side of me thinks, that by shortening the 'use by' dates, if people don't trust it, they throw it out, they go back to the shop and they buy more stuff.

MALE, 27, C1, NOTTINGHAM

As well as suspecting date labels of being a ploy to encourage extra purchasing, some people's trust in date labels was undermined by the observation that date labelling can be inconsistent across retailers:

M: The 'use by' date, I'm very dubious about them.

Q: Why?

M: Because it depends on what supermarket you bought it from and what 'use by' date they put on it. You go to an Asian supermarket, no such thing as 'sell by' date.

MALE, 45, E, NOTTINGHAM

Other participants mentioned that they had heard that supermarkets sometimes repackaged products with later date labels, which further undermined trust. In this context, it is notable that some participants described being happy to operate without date labels when buying food from local shops that they trusted. This again suggests that date labels are valued by some as a guard against being sold sub-optimal products, which some perceive as more likely to happen when shopping at the larger retailers.

Nevertheless, despite some uncertainty about the accuracy and reliability of date labels, most participants considered date labels a useful guideline and reported using them to some extent in their decision-making.

5.5 Consumer understanding and use of storage guidance

Inappropriate storage of food has been identified as a contributor to household food waste (WRAP, 2008b; Brook Lyndhurst, 2008b; WRAP, 2007c). As such, the depth and telephone interviews were designed to explore in detail the role of on-pack storage guidance in food storage behaviour. The following questions were investigated during the interviews:

- To what extent are storage messages sought out, understood and used?
- To what extent do consumers abide by storage guidance such as 'Once opened, use within x days', and how does this relate to food storage habits?
- How are storage messages and logos (such as the snowflake, used to indicate that the product is suitable for freezing at home) understood and used?
- What is the impact of inconsistent storage guidance within product categories?

The interviews were designed primarily to elicit information from participants about their storage habits and their understanding and use of storage guidance, within the wider context of their food habits and behaviours. First, participants were invited to construct narratives around kitchen diary entries, including decisions made at the pre-purchase, purchase and in-home stages. These narratives were analysed for unprompted references to use of storage guidance. During the later stages of the interviews, participants were also questioned more directly about their use of storage guidance.

5.5.1 General storage habits

Most participants adhered to highly personalised sets of storage habits that they had developed through a mixture of learning from others (parents, partners, friends) and through their own experience and experimentation. People's habits and rules of thumb were often informed by preferences and personal idiosyncrasies: for example, one participant tended to remove most food products from their packaging in order to put them in air-tight storage containers, because "I like to see them all stacked up". Most of these storage

behaviours were so deeply ingrained and habitual that the majority of participants considered their own practices to be “common sense” and “obvious”:

W: Yes, salad and like I said strawberries and whatnot would be in the fridge. Obviously tins are in the cupboard, bananas no they go funny in the fridge so they're in a bowl and the kiwis need to ripen. Potatoes in a dark cupboard, that sort of thing, is that what you're thinking?

Q: Yes, but do you refer to the labels on the packaging?

W: No probably not. Those sorts of things that I would buy are probably a bit obvious really.

FEMALE, 36, C1, SOMERSET

It was rare for participants to make unprompted references to using storage guidance when buying food, unpacking it at home and making consumption decisions. However, on further investigation, differences emerged between usage of different types of storage guidance. These differences are explored below.

5.5.2 Storage guidance: where and how to store food

The majority of people reported that on-pack storage guidance did not play a major part in their decisions about where and how to store food (see below for observations about freezing behaviours). Within this overall context, participants reported referring to this type of storage guidance most frequently for new or unfamiliar products.

W: Nine times out of ten no, I just use common sense or what I have always done, you know, I have always done it this way so I will carry on doing it this way, but I think if I tend to buy a newish product...occasionally I might go to somewhere like Marks & Spencer's and buy some pasta or something like that, and I would, as it is something different that I am buying or something new, then yes I would look.

FEMALE, 66, B, COVENTRY

Some participants talked about picking up tips about where to store products by looking at where they were stored in the supermarket:

Q: What about when you get home and you are unpacking the shopping, do you ever look at packaging information and that kind of thing?

M: If I am unsure about it, like the sour cream stuff. If I have got it out of the fridge I put it in the fridge, if I got it out of the freezer I put it in the freezer.

MALE, 24, C1, COVENTRY

However, most people were happy and confident to use their own judgement and ‘common sense’ in their decisions about where and how to store food.

5.5.3 Storage guidance: 'Once opened, use within x days'

Participants reported making greater use of ‘use within x days’ style storage guidance than where/how guidance. The overall pattern of use of this type of storage guidance echoed the patterns found in relation to date labels: while a small minority at one end of the spectrum always followed ‘use within’ guidance to the letter, and a minority at the other end of the spectrum claimed never to look at it, the majority reported making some use of ‘use within x days’ guidance, usually in combination with their own judgement:

M: If it's use within three days, if I've stored it in the fridge I'm less bothered about keeping it for five days because I'm thinking well I've stored it properly, use within three days they probably mean within a week it's going to be fine.

MALE, 44, A, NOTTINGHAM

At the risk sensitive end of the spectrum, 'use within x days' guidance generally replaced personal judgement:

W: I actually put sticky labels, like when I open jars or bottles I put a sticky label on with the date I open it, and [the Cranberry juice] had been open probably about a week so I just sort of threw it away. Because the packaging states you know, only keep it open for sort of four days.

FEMALE, 35, C1, COVENTRY

One particularly risk averse participant claimed that, if she couldn't remember how long something had been open for, she would throw it away "to play it safe", rather than use her own judgement.

Adherence to 'use within' guidance was, as with use of date labels, often proportionate to individuals' overall food risk sensitivity, coupled with product-specific rules of thumb about safety and quality risk. There was evidence that some participants assumed – not necessarily incorrectly, since this would apply to e.g. chilled foods - 'use within' guidance to be about food safety. In answer to a question about whether she viewed this type of advice as a strict safety rule or a more general quality guideline, one participant said:

W: Well probably something quite strict, I would have thought it was on there, you know, to keep people healthier.

FEMALE, 37, A, SOMERSET

Again, similarly to date labels, reliance on 'use within' advice was also related to the familiarity of the product, with the guidance more likely to be sought for new products. Reference to 'use within' guidance was also related to participants' perceived ability to make food judgements for themselves - this was again linked to perceived safety risk.

Other rules of thumb specific to products and product categories emerged around 'use within' guidance. For example, some participants reported that they paid most attention to this type of guidance for refrigerated products and several participants stated that they would rely more on this type of guidance for processed foods, or foods with more than one ingredient (e.g. hummus). Some claimed to be most relaxed about 'use within' guidance for products with longer life spans:

W: That's something I'm not very good at, use before whatever number of days...I'm not as conscious of the ones like use within two weeks or whatever.

FEMALE, 62, C1, COVENTRY

Behaviour towards 'use within' guidance typically reflected people's approach to date labels: those participants who took a very strict and cautious approach to date labels were also likely to adhere most closely to 'use within' guidance. The common root of both these behaviours seemed to be general food risk sensitivity:

W: I'm really funny about things being open longer than the date that it says, so like cheese, I'll open it say on a Monday and then by the Thursday I'm throwing it away, even though I probably only used it on the Monday, because it says throw away after opening three days or something.

FEMALE, 32, B, COVENTRY

There was evidence that, rather than reading the instructions on every product, people tended to generalise their approach to 'use within' guidance across product categories: knowledge of the recommended 'use within' period for one product was often extrapolated to other 'similar' products. In the case of a small number of highly risk sensitive participants, short 'use within' dates were applied indiscriminately across the board, out of a desire to avoid eating any food that had been open 'too long' - for example, one participant claimed to never eat anything that had been open for more than three days.

5.5.4 Freezing habits and the role of freezing guidance

Use of the freezer was determined by a range of different factors (not least the size of people's freezers), and many people had developed complicated sets of rules about what they would and would not freeze, when, and for how long. People's freezer rules of thumb varied, with some people assuming food could be frozen indefinitely, others having a 'four week rule' across the board, and a small number (erroneously) sticking to food dates, even when products had been frozen. A large number of participants expressed uncertainty about how long food could be kept in the freezer:

M: It's all guess work for me, in the freezer I've got chilli and I don't know how long you can theoretically keep it for, it is guess work.

MALE, 45, C1, NOTTINGHAM

The role of on-pack guidance in freezing behaviours again varied along a spectrum. Some participants assumed that any food could be frozen and did not seek out storage guidance, while others said they would not freeze anything unless the packaging indicated that the food was suitable for freezing:

W: If it's like a fresh product I always make sure it's got the freezing symbol. Because I know some things have already been frozen and then put on the shelf, and I never know if you can re-freeze them unless it has got the symbol...if it hasn't got it on I will sort of think, oh, well I can't freeze it.

FEMALE, 35, C1, COVENTRY

Reported use of freezer guidance was relatively low among the majority of people. Within this context, participants tended to vary in terms of when they looked at freezer guidance, with some claiming to look while shopping and others reporting using it as they unpacked their shopping. Again, reference to freezer guidance was reported as most common for new or unfamiliar products.

It was rare for participants to report freezing opened or partially used food, or unopened food that was approaching its date. Most participants claimed to freeze food on the day they bought it, or not at all. Many participants drew a link between this behaviour and adhering to 'Freeze on day of purchase' advice. This is another case where the advice found on some products tended to be generalised and incorporated into personal rules of thumb: the majority of people adopted the general rule of only freezing food on the day they bought it, regardless of storage guidance:

Q: So if things seem to be getting towards their 'best before' date and you feel you're not going to be able to eat them, would you then freeze them?

W: No, because for some reason things always say 'freeze on day of purchase', even though I don't know how it knows when you bought it. So that's one thing I always do. As soon as my meat arrives, I order some mince, chicken, I put it all into the freezer and take it out the night before I want it. But I would never have something in the fridge for a week and then freeze it.

FEMALE, 25, D, SOMERSET

People's personal preferences also influenced their storage decisions and participants often stored food in particular ways, despite knowing of more appropriate alternatives. A common example was fruit being stored outside the fridge in order to encourage family members (especially children) to eat it, or due to a preference for un-chilled fruits. Similarly, participants who were aware that they threw away a lot of bread often stated that this awareness would not induce them to freeze bread, because they did not like the taste of defrosted bread:

Q: Do you tend to freeze bread and pitta and stuff?

W: I don't really like it when it's defrosted, so no.

FEMALE, 25, D, SOMERSET

5.6 Links between date labels and storage guidance

Date labels are only a reliable indicator of food quality or safety if products are stored correctly and, as such, the interviews explored consumer understanding of this connection. The principal cause of confusion that emerged in this area was the meaning of date labels in the context of freezing food, both when deciding whether to freeze food and how long to keep it once frozen.

A small minority of participants reported (erroneously) adhering to the date on the label even with foods they had frozen:

W: Yes I would freeze it straightaway. If I bought something and my husband said, oh I don't fancy that, I would look at it and think right OK well I'll put it in the freezer and we'll have it in two days'

time or something like that, but I don't leave it more than a couple of days. You know I will take it out of the freezer and chuck it if we didn't use it after a couple of days.

Q: What, from the freezer?

W: Yes, because I just find these 'use by' dates, you don't know when they've been packaged.

Q: So you would follow the use by date even if it was in the freezer.

W: Yes I would.

FEMALE, 60, D, SOMERSET

Although this was rare behaviour, there was general confusion in evidence about the meaning of date labels on food in the freezer. Many people had adopted a generalised '4 week rule', but often remained uncertain.

As outlined above, most participants did not realise that food could be frozen up until the date on the label and the majority were in the habit of freezing food on the day of purchase, or not at all. The more important driver of this behaviour seemed to be blanket adherence to storage guidance ('Freeze on day of purchase'), rather than a misinterpretation of date labels, which were not commonly referred to in food storage decision-making (or indeed in food management decisions in general, as we saw above). However, there is clearly scope in this area for improving on-pack information to make it clearer to people that food can in fact be frozen up until the date on the label.

Most people had incorporated date labels and storage guidance into their food practices in ways that reflected their general approach to food, rather than reflecting a technical understanding of the labels. Against this backdrop, it is perhaps more useful to look at how the interface between dates and storage guidance works in practice, rather than simply looking at understanding, since it is unlikely that most people have ever thought about this explicitly. In this context, we can conclude that behaviour based on an understanding of the connection between date labels and storage guidance was not a particularly salient feature of most participants' food practices, but that the connection between date labels and freezing is an area of genuine uncertainty for many people.

5.7 Implications of storage guidance use for household food waste

The direct role of poor use of storage guidance in driving food waste is ambiguous, mainly because consumers' approach to storage guidance seems to be a manifestation of more general food behaviour patterns – for example, general risk sensitivity and caution are associated with a conservative approach to 'use within' and freezing guidance.

Nevertheless, it is possible to isolate a number of examples of connections between uncertainty and confusion about storage guidance and poor food management practices, which may have indirect food waste implications:

- The tendency to generalise 'rules' has turned the 'Freeze on day of purchase' guideline found on many foods into widespread reluctance to freeze any food after the day of purchase.
- Similarly, 'use within x days' guidance was often generalised by participants into a 'rule of thumb', leading some people at the most risk sensitive end of the spectrum to apply very short timescales to food they had opened.
- Uncertainty about whether 'use within' guidance is a quality or safety guideline also led some risk averse participants to err on the side of caution and throw food away. Stating 'best used within' for products where the guidance is a quality indicator, and 'use within' where it is a safety indicator, may reduce confusion.
- Uncertainty about whether particular foods are suitable for freezing meant that in some cases, food that could have had its shelf-life prolonged through freezing may have gone to waste.
- Uncertainty about the appropriate length of time food can be kept in the freezer caused a general lack of confidence among some participants and caused some frozen foods to be thrown away unnecessarily.
- A small minority of participants adhered to food dates for food they had frozen, despite a product having been frozen within date.

5.7.1 The impact of variations in storage guidance within product categories

A final question relating to storage guidance is the impact of inconsistently presented storage information – as storage guidance is not standardised, it often differs slightly across brands and product variants (WRAP 2010b). It is likely that the version any given participant would choose to pay attention to and incorporate into their personal systems is a reflection of their general food approach – for example, the most risk sensitive participants are likely to adopt the most conservative versions of, for example, 'use within' guidance.

The impact of differences and inconsistencies is likely to differ across products and across different types of guidance. For example, it is unlikely that most participants notice differences in where/how storage guidance for habitual purchases, since their storage behaviours are likely to be highly habitual. However, it is possible that differences in 'use within' periods on variants of the same product, if noticed, might undermine confidence in the reliability of these guidelines. This may be particularly the case among the most cautious consumers – and it is among these consumers where uncertainty leads to food being thrown away unnecessarily due to people 'playing it safe'.

5.8 Participant suggestions for improvements to date labels and storage guidance

At the end of each interview, participants were questioned along the following lines:

- If we wanted to help people understand and use date labels better (e.g. so they don't waste money by throwing away good food), what do you think would be the best thing to do?
- If we wanted to help people understand and use storage guidance correctly (so food doesn't go off early because of incorrect storage), what do you think would be the best thing to do?

The most common response to this broadly framed line of questioning was that people should be encouraged and helped to use their own judgement and common sense so that they would be *less* reliant on date labels:

M: For me it is more people need to know how to use their own judgement rather than knowing how to read dates on a packet, and I would sooner know how to tell when food is off rather than knowing what the dates mean and things like that.

MALE, 25, C1, NOTTINGHAM

When prompted specifically about improving on-pack labelling, responses were mixed and often contradictory. For example, a number of people suggested making date labels and storage guidance larger and bolder, whereas others thought that more prominent date labels might "scare people off". Similarly, while some participants suggested "spelling out" the meaning of the different date labels more clearly on the pack, through either rewording or adding an explanatory note, others thought that packaging was already too overcrowded and any additions would simply confuse people more.

A common response was that the date labelling system should be simplified so that they were only applied where safety might be an issue:

W: Simplifying the labels to one 'don't use after this' date for everything. It's either safe or it isn't. If it's safe then fine; if it isn't then they've told you don't use it after that date.

FEMALE, 62, C1, COVENTRY

One participant suggested removing the 'display until' date to avoid confusion:

M: I think they should get rid of the display until label, I mean that's just for the shops isn't it.

MALE, 48, C2, COVENTRY

A small number went further and suggested that date labels should be removed entirely, but the majority signalled that they would not be comfortable with this, except perhaps in the case of fruit and vegetables.

It was also common for participants to suggest that people needed to be more engaged with date labels and many thought that television, particularly cooking programmes, would be a good way both to get information across to people, as well as increasing awareness of date labels as a tool.

To summarise, a mixed picture emerged when participants were asked to make suggestions about improvements to labelling. It is important to note that asking people out of context about their preferences may not reflect what people would actually look for or use in a food decision-making context. Nevertheless, the set of responses to these questions did reveal some common threads:

- It seems that there was a prevalent feeling that date labels and storage guidance should not act as substitutes for personal judgement and, therefore, improvements in food management and planning skills would be an essential accompaniment to improved labelling information.

- There was also a widespread demand for simplification of the labelling system: many participants gave the impression that they found date labels over-complicated and that the effort required to understand the detail outweighed any perceived potential benefits.

5.9 Summary

The aim of the 69 qualitative depth and telephone interviews was to build up a rich, detailed picture of how date labels and storage guidance were interpreted and used by participants. Improving understanding of the role of date labels and storage guidance in food-related decision-making would help us to understand the ways in which they contribute to household food waste, and ensure that any interventions in this area could be appropriately designed and targeted. Key insights from the interviews are summarised below.

The majority of interviewees were not able to correctly distinguish between and define 'best before', 'use by' and 'display until' dates.

Different levels and types of misunderstanding emerged: some people took a 'blanket' approach to dates and treated any and all dates the same; while others did differentiate between date label types, but mixed up some or all of their meanings. Around two fifths of the interview participants were able to give a full, correct definition of the labelling system. This demonstrates that there is a genuine and widespread lack of understanding around date labels.

A lack of technical understanding of date labels did not, however, prevent people developing their own personal 'working definitions'.

Use of date labels lay along a spectrum, with the majority of people making some use of date labels in conjunction with their own judgement and other factors. The majority reported referring to date labels in-store to help them select the freshest or best products from the supermarket shelf. This part of the research revealed that the connection between understanding and behaviour around date labels is complex and multi-directional: *behaviour* influences interpretation and 'understanding', as much as, if not more than, understanding influences behaviour.

While it was relatively rare for participants to report using date labels to make on-going food management decisions at home, the majority reported referring to date labels for disposal decisions in the case of particular products.

A small minority relied almost exclusively on date labels for their disposal decisions, while a similarly small minority reported ignoring date labels entirely. With regard to people's personal rules of thumb, product type was a key factor in determining interpretation and use of date labels.

People tended to seek out and rely on date label information most for products with the highest perceived food safety risk and, to a lesser extent, quality deterioration risk.

This was related to participants' perceived ability to judge for themselves – the majority, when they were confident in their own ability to judge safety and quality for themselves, were happy to use date label information more as a yardstick, or not at all.

Product type was often a more important factor than label type in interpretation and use of date labels.

One unexpected outcome of this was that many participants used date labels 'correctly', treating 'use by' dates as strict rules and 'best before' dates as quality guidelines, without actually differentiating between these dates or even noticing that they were different, but being guided by the risk levels they attached to different product types.

Many participants questioned the accuracy and reliability of date labels, and expressed some mistrust about the motives of retailers and manufacturers.

It was interesting to note that some participants commented that they were happier to operate without date labels when buying from local suppliers whom they trusted. However, despite some doubts about the trustworthiness of date labels, most participants nevertheless considered them to be a useful guide.

Except at each end of the risk spectrum, most people's use of date labels was not fixed, but rather dynamic and subject to various factors.

Some of these factors were relatively permanent or embedded personality characteristics - for instance, wider risk sensitivity had a strong influence on how date labels were interpreted. Interpretation and use of date labels was also influenced by more contextual factors contingent on specific day to day circumstances – participants' mood often emerged from the kitchen diary narratives as influencing date label-related decisions.

In summary, people's approach to date labels was generally a reflection of their wider food practices: interpretation of date labels was rarely related to an understanding of the actual definition of the labels; rather, people's interpretation and use of date information was normally firmly embedded within, and informed by, their food values, attitudes, beliefs, knowledge, behaviours and their own personal context and circumstances.

Although throughout this research, respondents have indicated that they find date labels useful, and use them, many interviewees gave the impression that they found date labels over-complicated and that the effort required to understand the detail outweighed any perceived potential benefits.

Participants reported that they used storage guidance to a lesser extent than date labels.

As might be expected, storage guidance was referred to most frequently for new or unfamiliar products, and was not looked at every time for habitual purchases. However, the influence of on-pack storage guidance on personal rules of thumb was clear – it seems that once storage guidance has been read and digested, it is often incorporated into a set of general rules. These general rules were often applied across similar product categories or across the board and there was evidence that this generalisation may have been leading to some to store food in less than optimal conditions.

Different types of storage guidance were used to different extents.

Guidance relating to keeping products in cool and/or dry and/or dark places was not highly valued by most participants, who considered this to be 'common sense'. More frequently sought out were 'use within x days' and freezing guidance – although again, these were not referred to every time, but often adopted as general rules.

Previous qualitative research gives the impression that inconsistencies or exceptions to general storage rules (e.g. most, but not all, fruits should be kept in the fridge) can undermine consumers' faith in 'top level' guidance. Focus group participants responded most positively to advice which was tailored to specific products and when the benefits of the suggested storage method were explained (Brook Lyndhurst, 2008b).

It was unclear to most participants whether 'use within x days' guidance was about safety or quality.

Approaches to 'use within x days' typically reflected the approach to date labels, with the most risk sensitive participants being most cautious and conservative about both.

There seemed to be widespread uncertainty about freezing food, in particular, how long food could be kept in the freezer.

It was common for people to state that they were very unlikely to freeze food after the day of purchase, because the packaging instructed them otherwise. Interviewees also appeared uncertain about for how long food could be kept frozen and in a very small number of cases would use the date label (though it referred to the period before the product had been home-frozen).

6.0 Findings of the accompanied shops

6.1 Introduction and approach

This section contains a summary of the findings of 10 accompanied shops conducted with a cross section of the UK public, at a range of different retailers. Table 13 below summarises the recruitment strategy.

Table 13 Recruitment strategy: specification for accompanied shops

Location	Number of participants	Retailers
Somerset (Bristol and surrounding area)	4	<ul style="list-style-type: none">• Tesco• Morrison's• Asda• Marks and Spencer
Coventry	3	<ul style="list-style-type: none">• Waitrose• Tesco• Asda
Nottingham	3	<ul style="list-style-type: none">• Lidl• Tesco• Asda

Participants were selected on the basis of a number of characteristics, including where they usually did their main shop, and represented a range of age groups, household types and socio-economic groups (see appendix 1 for the full recruitment specification). As is typical in ethnographic research of this kind the sample size was not large; the aim was towards deep insight rather than a large numbers of subjects.

The purpose of the accompanied shops was to explore how date labels and storage guidance are used by consumers at the point of purchase, packing in the shop and unpacking at home. Shopping behaviours are well known for being highly habitual, with many pre-conscious drivers (FSA, 2010; IGD, 2007): the central aim of the exercise was therefore to be with participants at the moment of decision-making and to observe their behaviour.

Throughout the observation, participants were not aware that the focus of the exercise was on date labels and storage guidance (to avoid priming them to use of labels): they were told only that it was research into how people make decisions about food. The care taken by researchers to avoid any prompting of the participants during the shopping and unpacking process was part of an approach which, together with the building of a rapport, brought us as close as possible to the unobserved behaviour of consumers – although the inevitable influence on consumer behaviour of any observation should be acknowledged. Researchers recorded their observations in standardised pro-formas (see appendix 6), which included space to note down the range of considerations mentioned by participants, as well as specific observations around reference to date labels and storage guidance.

Participants were accompanied through a 'typical' shopping trip, during which they were asked to talk researchers through their decision-making processes, or to 'think aloud' as they shopped. Participants were asked to mention everything they were thinking about as they shopped and all the considerations upon which they based their decisions, regardless of how trivial they considered them to be. The researchers then travelled home with participants to observe them unpacking their shopping.

The accompanied shop research element provided the opportunity to observe how participants chose a particular product, what information they used to inform their decision and to hear an explanation of why they chose it. The process provided insight into the extensive range of influences affecting product choice, including pack size, store promotions, price and meal planning, and the salience of date label and storage guidance information within this.

The final step in the accompanied shop research element was a brief interview, which allowed further probing into the research questions, with the advantage of being able to base the questioning on recently observed behaviour (see appendix 7).

6.2 Research questions

This component of the research programme was devised to answer the following research questions through direct observation²²:

- To what extent are date labels and storage guidance used and interpreted at point of purchase and when unpacking shopping?
- Does the use of packaging information vary across products?
- How does the use of packaging information vary across different types of purchase, whether habitual, spontaneous or considered?
- What factors drive storage and disposal decisions and how do these link to on-pack dates and storage guidance?
- How are dates and storage guidance used in conjunction with one another to make storage/disposal decisions?
- What scope is there for improving communication of this information to consumers in a shopping context and how might this influence food waste?

These research questions provide a framework for discussion from the accompanied shop research in the sections that follow.

6.3 Use of labels at point of purchase and when unpacking shopping

Based on the self-reported behaviour in the baseline questionnaire (see section 3), it would seem that the majority of consumers claim to check date labels to some extent while shopping. However, this behaviour was observed relatively infrequently during the accompanied shops. Only one of the ten accompanied shoppers used date labels deliberately, and a further two participants were observed to briefly glance at date labels on some products. The remaining seven shoppers were not observed to refer to date labels, nor did they mention doing so during their 'thinking aloud'.

This apparent over-reporting of reference to date labels when shopping may suggest that some consumers see checking the label as the right thing to do, or perhaps the clever ('savvy shopper') thing to do, but in a real life shopping situation, other considerations are more important in their decision-making. The typical shopper juggled an astonishing range of considerations as they shopped. Price (including special offers and "bargains") was the main factor at the forefront of most people's minds, most of the time. However, in shoppers' quest to achieve optimal value for money, price was constantly combined with, and traded off against, such considerations as:

- The physical appearance of products (selecting the 'nicest' potatoes or the pinkest ham).
- Consideration of their mental inventories of what was already at home.
- Favoured product variant (selecting smoked bacon rather than unsmoked).
- Catering to the particular preferences of different family members.
- Quantity of food needed/pack size.
- Brand.
- Plans for particular meals or occasions.
- The quickness and convenience of food preparation.
- General stocking up of cupboards to ensure they never ran short – including both staples and 'treats'.
- The healthiness of products (e.g. calories) and the special dietary requirements of different family members (e.g. gluten free products).
- Consideration of storage space at home ("Have I got room in the freezer for this bread?").

Shelf-life of food was considered while shopping, often by means other than reference to the date label. For example, fruit, vegetables, bread and cooked/cured meats (including bacon) were all examples of products that some participants assessed using touch and sight. Food from the reduced counter was often bought with the intention of it being eaten or frozen that day – the fact that it was in the reduced section indicated it was approaching the end of its shelf-life and those participants who bought reduced items did not always re-confirm this by checking the date. Some shoppers mentioned in their post-shop interview that they did not need to look at dates on food that was bought to be eaten on that day, or on particular occasions in the near future (such as a dinner party or a picnic), since they knew exactly when the food would be eaten.

These observations suggest two important implications for how date labels are used in-store, and why:

- First, it is perhaps revealing that, when asked, some participants considered date labels to be an accountability mechanism that prevented supermarkets putting 'old' food on the shelves. It is possible that the simple presence of the date label is enough to satisfy many consumers that the food is fresh and many do not feel the need to process the information on individual labels while shopping. In this sense, it may be the case that the date label itself, rather than the information on it, is most important in building general consumer

²² Also see the pro-forma for the accompanied shops (appendix 6) and for the post-shop interview (appendix 7).

trust. It is interesting to note that some depth interviewees stated that they were happy to operate without date labels when they shopped at local stores (such as butchers) that they trusted.

- Second, where specific date information was used deliberately, labels functioned principally as a tool of risk management, used to evaluate whether there would be enough time to use the product in question and, therefore, whether or not it would be a waste of money to buy it. This more deliberate use of date labels occurred in decisions around different types of food, including the most perishable products with the shortest shelf-life - for example, pre-packed vegetables and salads; higher value foods, such as chicken-based chilled ready meals and foods on special offer. For example, one shopper decided to "go for" a two-for-one offer on cheddar cheese, after checking the date label and calculating that he would be able to get through both in the time given. Contextual factors, such as knowing that food would be eaten that day, reduced the 'value for money' risk and, therefore, the need to look at the label.

In summary, the discrepancy between self-reported and actual behaviour may be partly explained by a number of factors. First, rather than being referred to deliberately on every occasion, date labels played a more generic trust-building role, with consumers perceiving their mere presence as guarding against the risk of being 'ripped off' by supermarkets. Second, date labels were one of a number of tools used to assess product shelf-life and 'value for money' in-store. These other tools were often more accessible or easier to use – for example, sensory inspection, consideration of when the food would be eaten or personal rules of thumb about how long different foods could be kept. Purchasing decisions with the highest level of uncertainty around product shelf-life and when the food would be eaten were those for which date labels were used the most. Overall, however, the overriding factor for most people as they shopped was price:

Q: We're interested in whether you refer to date labels?

W: No, not really... I sort of just go there and just see really what's cheapest.²³

FEMALE, 27, C2, BRISTOL (ASDA)

6.3.1 Ways packaging information is used

Routine and habit have a strong influence

Consumers appear to have become 'accustomed' to products, to the extent that they were able to use their experience of the lifespan of particular food items and referred to the dates on the label less than previously. Similarly, when shopping with the knowledge that a household will consume routinely purchased food at a particular rate – according to a predictable pattern – then labels were referred to less. This was particularly the case for household with high turnover of food:

W: We run out of food before we run out of date in this house.

(WIFE OF) MALE, 42, C1, BRISTOL (MORRISON'S)

The corollary of these observations is that when a particular purchase or shopping circumstance is unusual then labels will tend to be referred to more, both for dates and storage guidance. This again reinforces the point that use of labels is often proportionate to levels of uncertainty.

Contextual factors influence use of labels in-store

The circumstance of a particular shopping trip also appeared to affect the way in which labels were used. The habits and routines discussed above may no longer apply when a visit to the shops is hurried or if the presence of small children makes detailed consideration of purchases difficult – as was the case in two of the Somerset shopping trips to Morrisons and Asda. When shopping for particular scheduled events, such as a dinner party or a meal on a particular day, it may not be considered necessary to check labels as much as usual, or even at all, since there is less uncertainty about when the food will be eaten.

6.3.2 Food waste when unpacking shopping at home

Four out of the ten accompanied shoppers threw food items away when unpacking their shopping at home. Examples of products thrown away at this stage were bread, yoghurt, cooked potatoes in a bowl, a jar of pickles and various frozen items.

²³ Questions of this sort (i.e. that refer to labels directly) were only asked towards the end of interviews in order to avoid 'priming'.

Some food was thrown away simply to make room for new items, regardless of its condition or the date on the label of the discarded food. In some cases, food that was out of date or past its best was thrown away because unpacking caused people to notice the condition of the food or the date on the label.

These observations suggest that unpacking shopping is indeed a decision point where disposal decisions occur. This contrasts somewhat with the findings from the diary research, which suggested that the majority of disposal decisions occur at the 'about to cook/eat' point.

On balance, it would seem that whilst the majority of items are indeed disposed of at the 'cook/eat' decision point, the 'unpacking the shopping' point may nevertheless be a worthwhile target for behaviour change interventions - although these are likely to have most impact when coupled with changes to pre-shop planning activities, for example, stock checking before going shopping.

6.3.3 Scope for improving communication of information to consumers

Unfamiliar vs. routine purchases

Although there was little evidence of labels being used for familiar items, this should not be taken to imply that they were never responsible for informing on-going behaviour relating to particular products. Coupled with suggestions that labels are referred to on new items, it seems that there is a role for labels in the formation of habits and furthermore that the launch or re-launch of items may provide an intervention point for influencing consumer behaviour with regard to use of labels.

Once habits have been formed, there is less opportunity for intervention

Once habits are formed, observations suggest that consumers refer very little to information presented on food packaging. However, it is not clear the extent to which alterations in the presentation of products and their labels can influence habits; and the accompanied shops were not directly intended to shed light on approaches to changing consumer habits.

Recommendations from participants

Participants gave a range of suggestions for communicating date and storage guidance information or for raising awareness of the issues surrounding food waste. Of direct relevance to date labels and storage guidance were suggestions to make labels larger and more prominent. Other feedback provided mentioned the role of education, including encouragement to consumers to use their judgement. Still others mentioned the use of media, from in-store magazines, to mainstream food and housekeeping periodicals.

6.4 Influence of participant type on use of date labels and storage guidance

This research has shown that a multiplicity of factors influence both shopping and in-home food behaviours in general, and the use of date label and storage guidance in particular. An overarching factor appeared to be the lifestyle and family circumstances that characterised each individual participant. A flavour of this is given by these three brief pen portraits:

Case study 1: Male, 42,C1, Bristol, Asda

This participant was carrying out a large weekly shop for a household with six children. He had experience of food as an ex-chef and also through an active role with the shopping and cooking. The shopping expedition was efficient, using a list, and carried out rapidly. It was clear that in-store behaviour was highly habitual. Price, and seeking out bargains, was the primary motivation.

He was clear about the high rate at which food was consumed in the household, which meant that he did not need to think about the dates on the labels. He was sufficiently experienced to know about storage requirements and to make extensive use of his freezers without referring to storage guidance on the food packaging.

However, a few food products were selected with reference to date labels, for example meat products. Eggs, cream and bacon were selected from the back of the shelf for longer life.

Waste in the household was said to be low, with only a few items thrown away when unpacking the shopping. According to the participant, when waste does occur at other times, it is accidental or due to items not being liked by the family.

Case study 2: Female, 62, C1, Bristol, M&S

We observed the participant carrying out a small shopping trip. Her husband was temporarily housebound on account of being unwell and she selected quite a few ready-meals as a result since she was away at work during the day. She tended to shop frequently, on her way home from work, buying small quantities at a time. In the store she took plenty of time to check for bargains and for one-off luxury items.

The participant would check date labels for certain food types, particularly dairy items, and is strict about throwing away eggs on the date. Although quite strict about dates in general, and uses no list, she is highly organised and said they do not tend to waste food.

Case study 3: Male, 35, C2, Nottingham, Lidl

In this case the participant was concerned most of all with convenience and ensuring that he had easy things in stock for his evening meal. He never used a list, did not cook meals from scratch and shopped according to a range of factors including price, preference (both established and spontaneous), storage space at home and habit. At home, items that he "didn't fancy" eating were thrown out, as were items that he judged he would not get round to using. Older items were replaced with newer ones; in the case of frozen items, this was to make room for new products.

Although items were stored so that they would last for as long as possible, and reduce the need to shop too often, on-pack guidance was not referred to in order to make these decisions.

Case study 4: Female, 40, B, Coventry, Waitrose

This participant was anomalous in the sense that price was not the primary driver of her decisions. She enjoyed the shopping experience in and of itself, and strove to make her shopping trips as pleasurable as she could, by choosing to shop in a high-end store and giving free reign to her preferences.

This participant was primarily concerned with ensuring that her cupboards were well stocked and that she would have a range of options at meal and snack times for herself, her husband and her two school-age children. It was important for this participant to have a range of foods that could be prepared quickly and easily, according to what different family members felt like eating on any given occasion. She took great care to select products that she knew she and her family would enjoy.

At home, this participant used a second fridge (she termed it her 'overflow fridge') to store food, and also made extensive use of the freezer. She threw away a small number of items as she unpacked, mainly leftovers that she had saved but not got round to using, as well as old and wilted salad.

6.5 Summary

Overall, date labels and storage guidance were used relatively infrequently by consumers whilst shopping and unpacking. Labels were not consistently checked as a matter of course by any participants; on the occasions where label information was sought, it was generally in conditions of uncertainty about, for example, when the food would be eaten, or if the product was unfamiliar.

The accompanied shops suggested that date labels are used in two distinct ways in-store:

- 1 Although date label information may not be 'centrally processed' on every occasion, their presence is important for building trust and helping consumers feel they are not being sold food that is past its best.
- 2 Where date label information was sought out for particular products, it was generally part of a shelf-life calculation, centred on whether the participant would have enough time to eat it the food and therefore whether it was worth buying.

An astonishing range of factors were observed to be taken into account whilst participants shopped, e.g. price, appearance, meal plans, convenience, health, and shelf-life. In terms of judging shelf-life, participants used a range of tools. Date labels were used sometimes, but shelf-life/value for money judgements were more often made based on other considerations, including contextual factors ("when will it be eaten?") and physical appearance.

A number of background characteristics played a part in label use. An important factor was household size and the consequent throughput of food in these households: where there was high turnover of food, there was little chance of it being left long enough to go off and less need to check the date labels.

Similarly, the kind of shopping trip or purchase influenced the use of food labels e.g. whether the visit – or purchase – was spontaneous or habitual, whether the participant was in a hurry or whether they were accompanied (and distracted) by a small child. New purchases were more likely to involve the use of labels, as were trips where there was less pressure, for example, where there was no shortness of time.

The use of storage guidance was not much observed during the accompanied shops. However, there are indications from interviews in this exercise and elsewhere in the project that storage guidance can become generalised and incorporated into 'common sense' and habit – in other words, although it may not be checked every time, it does seem to play a part in storage habit formation.

Food waste occurred when unpacking shopping at home in four out of ten of the accompanied shopping trips. Some items were thrown away to make room for newly purchased items, often regardless of the date on the labels of the older items. In other cases, food was thrown away because it was past the date on the label, or otherwise past its best. This suggests that the 'unpacking' decision point would be a worthwhile target for intervention and this type of intervention might be most effective if coupled with interventions around stock checking prior to shopping, to avoid duplicate purchases.

7.0 The online survey results

7.1 Introduction

The online survey had two broad purposes:

- Firstly, it provided an opportunity to explore, in a quantified fashion, a number of the findings emerging from the earlier qualitative stages of the research.
- Secondly, it provided an opportunity to investigate consumer perspectives on a number of issues raised by WRAP's previous research (WRAP 2010b) on the variety of packaging and labelling strategies adopted by retailers and manufacturers.

The online survey – the fieldwork for which was commissioned from ICM²⁴ - asked two main blocks of questions: a first block focusing on date labels and a second block focusing on storage guidance. A key feature of the questionnaire was the use of images: most questions involved the display of a label or a product to which respondents were invited to respond.

The images comprised two basic types: images of date labels in isolation; and images of date labels and/or storage guidance on actual products. In the case of the former, the images were 'neutral' in that they included no supplementary information and were associated with no particular brand or product. In the case of the images of products, images were derived from WRAP's database of images (WRAP 2010b) and digitally modified to show, where relevant, the dates or storage guidance that was being tested. Participants were instructed to treat each product as if it was their 'usual brand' when answering questions. The questionnaire used for the online survey is given in appendix 8.

A key purpose of the questionnaire was to compare alternative presentations of date and storage information. The comparisons were, by and large, intended to test the hypothesis that in general it is 'better' if information is simpler, clearer and more consistent. 'Better', in this context, itself has two components: it means that something is more fully understood and it means that it has, or is likely to have, some impact on actions/behaviour.

The design and execution of the online survey was based on these aspects. In terms, for example, of the kinds of questions asked and their sequencing, there was a general progression from questions exploring understanding towards questions exploring the consequences of that understanding.

The total sample for the survey was a nationally representative sample of 2,008 individuals. For the majority of the questions, all respondents were shown the same images and results were achieved for the whole sample. For a number of questions, the sample was split into three approximately equally-sized groups so that minor variations between labels could be explored.

Because of the large number of variations tested, as well as the three-way sample structure, the total data set generated is large. A 'topline' tabulation of the results (that is, without any sophisticated cross-tabs or segmentation of results) runs to ~300 tables. This chapter presents, therefore, only the key points derived from the topline tables, together with highlights of particular variation (e.g. where there are significant differences in responses between age groups).

7.2 Questions to test 'understanding' of date labels

Responses to the three date labels ('best before', 'use by' and 'display until'), were explored in isolation and then in combination with other date label information. For example, survey respondents were shown images of 'best before' date labels on their own and then in combination with a 'display until' date. Such combinations were also sometimes shown with other information (e.g. 'lot codes' and 'disguised display until' codes²⁵). There was a focus on these because previous research had suggested that consumers mistakenly interpret 'display until' dates as either 'best before' or 'use by': the use of 'hidden' or coded 'display until' dates (i.e. transparent to the retailer but opaque to the consumer) might alleviate this issue.

In this section, each type of date label is addressed in turn before identifying common threads. In each case, a table (or tables) are presented summarising the survey results. The figures are given in percentages, indicating the percentage of respondents that selected the relevant option. The 'correct' figures are highlighted in bold.

²⁴ www.icmresearch.co.uk

²⁵ In this survey, the control code system was tested as a 'disguised display until'. This system consists of a figure in brackets close to the 'best before' date, which advises the retailer to remove the product from the shelf earlier by the number days indicated in the brackets.

Base sizes vary slightly, since not all images were shown to all respondents and the three groups varied slightly in size (645, 660 and 702). All figures have been weighted to reflect the structure of the UK population. Full details of sample sizes, weighting and so forth are presented in the full table set.

As well as presenting the overall results for each of the three date label types, key highlights of variation between subsets of the population are also presented. As well as distinguishing gender, age etc., respondents were analysed depending on their answers to question B2 for cheddar cheese (see section 7.3). This question proved a useful way of identifying strict 'date label users' i.e. those who report eating cheese only up to the date on the label. This categorisation is different from but complementary to the cluster analysis presented in earlier chapters.

7.2.1 'Best before'

Table 14 Survey results for 'best before' dates (QB1a,b,c)

Label shown	Label description	Responses (%)				
		Question B1a: 'What information is shown in this label?'			Question B1b	Question B1c
		'The last day on which the food is at its highest quality'	'The last day on which the food is safe to eat'	'The day the food must be sold by'	'Have you seen this label before?' ('Yes')	'How easy is this label to understand?' ('Very easy' or 'Quite easy')
Best Before 26 AUG 2010	'Best before'	85	14	10	95	94
BEST BEFORE 27 AUG 2010 L76831	'Best before' with lot codes	80	17	9	83	92
Best Before (2) 22 AUG 2010	'Best before' and disguised 'display until'	77	19	9	78	83
Display Until 26AUG2010 21:19 L1	'Best before', 'display until' and lot codes	75	20	81	78	89
BEST BEFORE END 28AUG2010	'Best before end'	75	20	10	80	85
Best Before 27AUG2010 41129 (2)	'Best before', disguised 'display until' and lot codes	74	20	11	52	68
Display Until 27AUG2010 Best Before End 29AUG2010	'Best before end' and 'display until'	71	27	81	87	85
Display Until 24AUG2010 Best Before 26AUG2010	'Best before' and 'display until'	70	20	86	89	92

Table 15 Socio-demographic variation in responses (QB1a,b,c)

Label	Label description	Variations						
<div>Best Before</div> <div>26 AUG 2010</div>	'Best before'	No gender variation; no variation by age in correct interpretation; younger people more likely than older people to select 'last day on which safe to eat' (21% 35-44, 9% 65+); 'date label users' more likely to make this error (22% vs. 8%).						
<div>BEST BEFORE</div> <div>27 AUG 2010</div> <div>L76831</div>	'Best before' with lot codes	No gender variation; younger people make errors more than older people (23% of 18-24 and 24-35 cite safety, compared to 11/12% for 55-64 and 65+); and older people more likely to be correct (83% 65+ select 'quality' vs. 72% 25-34 year olds).						
<div>Best Before</div> <div>(2) 22 AUG 2010</div>	'Best before' and disguised 'display until'	No gender variation; young people more likely to state 'last day on which food is safe to eat' (23% of 25-34, 13% 65+) and less likely to correctly pick 'quality' (68% 18-24 vs. 83% 65+); 29% of 'date label users' pick 'safe to eat' compared to 10% of those that ignore date labels.						
<table><tr><td>Display Until</td><td>Best Before</td></tr><tr><td>26AUG2010</td><td>28AUG2010</td></tr><tr><td colspan="2">21:19 L1</td></tr></table>	Display Until	Best Before	26AUG2010	28AUG2010	21:19 L1		'Best before', 'display until' and lot codes	No gender differences; no variation by age in understanding of 'best before' element; 95% of 18-24 band cite 'day the food must be sold by' compared to 73% of 65+; families with children more likely (27%) to believe 'last day on which safe to eat' compared to households with just adults (18%); date label users make the same error (29% vs. 13% for non-users).
Display Until	Best Before							
26AUG2010	28AUG2010							
21:19 L1								
<div>BEST BEFORE END</div> <div>28AUG2010</div>	'Best before end'	No gender differences; age differences less marked than for other 'best before' combinations; marked differences for date label users (67% cite 'quality' and 30% for 'safety' vs. 78% and 12% for non-users respectively).						
<div>Best Before</div> <div>27AUG2010</div> <div>41129 (2)</div>	'Best before', disguised 'display until' and lot codes	No gender variation; age-based error (34% of 18-24 choose 'safe to eat' date vs. 13% 65+); date label users choose 'quality' less (66% vs. 83% for non-users) and 'safe to eat' more (27% vs. 12%).						
<div>Display Until</div> <div>27AUG2010</div> <div>Best Before End</div> <div>29AUG2010</div>	'Best before end' and 'display until'	Very few differences between groups: age profile less marked than for other 'best before' combinations; no gender differences or differences resulting from presence or other wise of children; minor differences associated with date label use.						
<div>Display Until</div> <div>24AUG2010</div> <div>Best Before</div> <div>26AUG2010</div>	'Best before' and 'display until'	Modest gender differences (4/5%) on 'quality' and 'safety'; no significant age profile variation; households with children more likely to choose 'safety' (25% vs. 19%) and less likely to correctly identify 'sold by' (80% vs. 87%).						

Key observations arising from Table 14 are:

- A clear majority of respondents (ranging from 70% to 85%) correctly identified the 'best before' date as referring to the 'last day on which the food is at its highest quality'.
- However, the introduction of additional information reduced correct identification markedly. The introduction of 'display until' information, in particular, saw correct understanding of 'best before' fall to 71% and 70%.
- The simplest 'best before' label is the most recognised (95% report having seen it before) and the easiest to understand (94%). Reported understanding overall is generally high: although the introduction of lot codes seems to reduce ease of understanding (presumably because consumers do not know what they mean).
- This may in turn be linked to familiarity. Lot codes are generally less familiar to consumers (<80% report having seen them before) and this may introduce an element of anxiety. Strikingly, the combination of a lot code and a disguised 'display until' date produces a steep drop in recognition (52% claim to have seen them before) and a concomitant drop in ease of understanding (68%).
- There seems to be an issue concerning the word 'end': appending it to 'best before' reduces correct interpretation by 10% points and its inclusion alongside a 'display until' date causes an upward spike in the belief that the label indicates 'the last day on which the food is safe to eat'. Similarly, 'best before end' is reported as having been seen by 80% of respondents (compared to 95% for 'best before') and produces a near 10% drop in ease of understanding.
- Even in the case of the very simplest presentation (the first label), one in seven respondents incorrectly interpreted the 'best before' as indicating the last day on which the food is safe to eat. With rising complexity of information – and, we surmise, rising doubt in the minds of respondents – the proportion making this error increases. Presented with equally sized 'display until' and 'best before end' dates, more than a quarter of respondents believed they were being told the date of the last day on which it would be safe to eat the food. (Further consideration of 'display until' dates appears below).
- These first findings point towards the possibility that relatively high levels of 'background ignorance' can be significantly augmented by confusion borne of excessive information and/or that date labels 'leak' into one another. (Compare, for example, the final pairing: the introduction of 'end' causes not only a spike in the numbers believing that the label is telling them 'the last day on which the food is safe to eat' but also a fall in the number thinking that it shows 'the day the food must be sold by'.)
- On balance, 'simple' and 'clear' (i.e. 'best before' on its own) appears generally preferable. Seemingly minor amendments (the addition of 'end', the introduction of a disguised 'display until' date, the presentation of an additional, well understood date ('display until')) have the power to produce marked drops in comprehension.

In general terms, Table 15 shows that:

- There are no differences between males and females in how they interpret these various 'best before' labels.
- There is a consistent variation by age, in which younger respondents incorrectly interpret labels more (and sometimes much more) than older respondents.
- There are relatively few variations as a result of the presence or otherwise of children.
- There are marked differences between respondents on the basis of their classification as 'date label users', with strict users of dates consistently more likely to incorrectly interpret labels or more likely to err on the side of 'blanket caution' and treat all dates as if they meant 'use by' (see next section).

7.2.2 'Use By'

Table 16 Survey results for 'use by' dates (QB1a,b,c)

Label	Label description	Responses (%)				
		Question B1a: 'What information is shown on this label?'			Question B1b	Question B1c
		'The last day on which the food is at its highest quality'	'The last day on which the food is safe to eat'	'The day the food must be sold by'	'Have you seen this label before?' ('Yes')	'How easy is this label to understand?' ('Very easy' or 'Quite easy')
<div>Use By</div> <div>26 AUG 2010</div>	'Use by'	25	76	6	92	95
<div>Use By End</div> <div>23 AUG 2010</div>	'Use by end'	22	76	6	69	83
<div>USE BY</div> <div>25 AUG 2010</div> <div>12, 08</div>	'Use by' and lot codes	23	75	7	68	80
<div>USE BY</div> <div>27 AUG 2010</div> <div>(2)</div>	'Use by' and disguised 'display until'	26	74	7	82	90
<div>USE BY</div> <div>26 AUG 2010 (2)</div> <div>L3321</div>	'Use by', disguised 'display until' and lot codes	29	71	7	70	84
<div>DISPLAY UNTIL</div> <div>28 AUGUST 2010</div> <div>USE BY END</div> <div>30 AUGUST 2010</div>	'Use by end' and 'display until'	32	70	79	85	90
<div>Display Until</div> <div>25 AUGUST 2010</div> <div>Use By</div> <div>27 AUGUST 2010</div>	'Use by' and 'display until'	32	69	76	90	94
<div>Display Until</div> <div>24 AUGUST 2010</div> <div>Use By</div> <div>26 AUGUST 2010</div> <div>L6112</div>	'Use by', 'display until' and lot codes	31	65	83	73	89

Table 17 Socio-demographic variation in responses (QB1a,b,c)

Label	Label description	Variations						
<div>Use By</div> <div>26 AUG 2010</div>	'Use by'	No significant gender differences, though females a little more like than males (78% vs. 74%) to correctly interpret; age profile follows similar pattern for other 'use by' labels – older people more likely incorrectly to cite quality (30% for 65+ compared to 17% for 18-24) and less likely to correctly cite safety (68% vs. 85%).						
<div>Use By End</div> <div>23 AUG 2010</div>	'Use by end'	No gender differences; age profile consistent with other 'use by' date combinations; users of date labels more likely than non-users correctly to cite 'safe to eat' (86% vs. 69%) and less likely to cite 'quality' (16% vs. 25%).						
<div>USE BY</div> <div>25 AUG 2010</div> <div>12, 08</div>	'Use by' and lot codes	No gender differences; older people more likely to incorrectly cite 'quality' (33% of 65+ vs. 11% 25-34) and less likely to correctly cite safety (64% vs. 83%).						
<div>USE BY</div> <div>27 AUG 2010</div> <div>(2)</div>	'Use by' and disguised 'display until'	Women (79%) more likely than men (69%) to correctly identify 'safe'; older people more likely to incorrect cite 'quality' (32% of 65+ vs. 20% 18-24) and less likely to correctly cite safety (68% vs. 90%); date labels users more likely than non-users to cite safety (84% vs. 65%) and less likely to cite quality (15% vs. 32%).						
<div>USE BY</div> <div>26 AUG 2010 (2)</div> <div>L3321</div>	'Use by', disguised 'display until' and lot codes	This label seemed to prompt more marked gender differences: 79% of women cited 'safe to eat' compared to 64% of males; and 33% of males cited quality compared to 25% of women; awareness of the 'safe to eat' meaning lower amongst older people (61% of 65+ vs. 86% of 25-34).						
<div>DISPLAY UNTIL</div> <div>28 AUGUST 2010</div> <div>USE BY END</div> <div>30 AUGUST 2010</div>	'Use by end' and 'display until'	Gender has no impact on 'quality' or 'sold by' but women are more likely than men to correctly identify 'safe to eat' (75% vs. 65%); younger people more likely to correctly identify 'sell by' date (94% 18-24 vs. 75% 65+) and 'safe to' date (77% and 60%); date label users much more likely (78%) to note 'safe to eat' meaning compared to non label users (63%).						
<div>Display Until</div> <div>25 AUGUST 2010</div> <div>Use By</div> <div>27 AUGUST 2010</div>	'Use by' and 'display until'	No gender difference; age profile similar to 'use by end/display until' erroneous interpretation that dates refer to quality is low for young people (21% for 25-34 year olds) and high (48%) for retired people; variation between label users and non-users (38% of the latter cite quality compared to 25% of the former).						
<table><tr><td>Display Until</td><td>Use By</td></tr><tr><td>24 AUGUST 2010</td><td>26 AUGUST 2010</td></tr><tr><td colspan="2">L6112</td></tr></table>	Display Until	Use By	24 AUGUST 2010	26 AUGUST 2010	L6112		'Use by', 'display until' and lot codes	Modest gender difference re 'safe to eat' with men less likely (61%) than women (68%) to correctly identify; age profile consistent, with younger people more likely to correctly cite 'safe' (72% 25-34, 55% 65+); and users of date labels more likely (75%) than non-users (59%) to correctly cite 'safe to eat'.
Display Until	Use By							
24 AUGUST 2010	26 AUGUST 2010							
L6112								

Key observations relating to Table 16 are:

- The proportion of respondents correctly interpreting 'use by' to indicate the last day on which the food is safe to eat is no higher than three quarters. Though, obviously, a clear majority of the population, levels of accurate interpretation are around 10% points lower than for 'best before'. As with 'best before', the inclusion of additional information tends to reduce correct interpretation, though not as markedly.
- Familiarity with the 'use by' date and claims of how easy it is to understand are, however, very similar to 'best before'.
- Respondents incorrectly suggested that either the 'use by' date on its own or in combination with other date elements means 'the last day on which the food is at its highest quality' varies from 22% (for 'use by end') to 32% (when the 'use by' or 'use by end' date is presented in conjunction with the 'display until' date).
- Understanding of the 'display until' date (when shown) is commensurate with the results for when the 'display until' is presented alongside a 'best before' date (76%, 79% and 83%).
- Lot codes in general produce a fall in ease of understanding, probably – as before – as a result of a lack of recognition.
- The figures confirm the impression that, although a clear majority appear to understand the 'use by' and 'display until' dates, a significant minority – between a quarter and a third – would appear either not to understand or appear to interpret incorrectly.
- In the case of 'use by', these errors may have food safety implications, but are potentially less significant for food waste than for 'best before'.
- As with 'best before', clearer and simpler labels appear 'better', though again, as before, the interaction between label elements has the power to undermine accurate interpretation.

In general terms, Table 17 shows that:

- There are relatively few differences between the genders, although women are in general more aware than men that 'use by' concerns food safety.
- Older people appear to look at and/or use labels less than younger people; but there are differences between 'best before' and 'use by', with the latter consistently misunderstood by a significant minority of older people. This suggests that older people's 'default' date interpretation may be 'it means best before'.
- People identified as 'users of date labels' are more likely than 'non users' to correctly understand these labels, both singly and in combination. Combining this with responses to the 'best before' dates reinforces the suggestion that 'date labels users' default to 'use by' as their interpretation of dates.

7.2.3 'Display until'

Table 18 Survey results for 'display until' dates (QB1a,b,c)

Label	Label description	Responses (%)				
		Question B1a: 'What information is shown on this label?'			Question B1b	Question B1c
		'The last day on which the food is at its highest quality'	'The last day on which the food is safe to eat'	'The day the food must be sold by'	'Have you seen this label before?' ('Yes')	'How easy is this label to understand?' ('Very easy' or 'Quite easy')
<div>Display Until</div> <div>27 AUG 2010</div>	'Display until'	7	2	92	89	91
<div> <div>DISPLAY UNTIL</div> <div>24 AUG 2010</div> </div> <div>L3321</div>	'Display until' and lot codes	9	3	89	76	88

- Seen in isolation from other dates, 'display until' dates are recognised, easily understood and correctly interpreted by the overwhelming majority of respondents.
- Only a very small proportion (7% to 9%) erroneously believes that the 'display until' date signals the last day on which the food is at its highest quality.
- This is consistent with the findings when the 'display until' date is presented alongside 'best before' and 'use by' dates, when the 'display until' was consistently accurately interpreted by a large proportion of respondents (although it did, as seen above, appear to cause a fall in the understanding of these other date types).

Table 19 Socio-demographic variation in responses (QB1a,b,c)

Label	Code	Variations
<div>Display Until</div> <div>27 AUG 2010</div>	'Display until'	No gender differences; no age differences; no significant variations across any other demographic group
<div> <div>DISPLAY UNTIL</div> <div>24 AUG 2010</div> </div> <div>L3321</div>	'Display until' and lot codes	Slightly higher correct understanding amongst women compared to men (92% vs. 87%); slight decline in correct interpretation with age (91% 25-34, 86% 65+); no other variations of note

- When considered in isolation, there appear to be no significant differences in the understanding of 'display until' dates among different population groups.

7.2.4 Date label summary

- 'Display until' dates appear familiar to, well understood and accurately interpreted by the overwhelming majority of respondents. This applies whether such labels are presented alone or in combination with other dates.
- 'Best before' dates are also well understood and familiar in general: however, the presence of other information and/or dates (i.e. 'display until') acts to reduce accurate interpretation, in some cases markedly, and there are some important variations in accurate interpretation. In particular, older people are more likely than younger people to accurately interpret 'best before', while respondents classified as 'date label users' are more likely than other groups to incorrectly interpret 'best before'.
- Although 'use by' dates are familiar and are reported as, by and large, 'easy' or 'very easy' to understand, they are the dates that are most likely to be incorrectly interpreted. Again, the presence of other information and/or dates (i.e. 'display until') acts to reduce accurate interpretation, in some cases markedly. Furthermore, variation among different segments of the population reveals an intriguing pattern, in which older people are more likely than average to interpret 'use by' incorrectly, while 'date label users' are generally accurate in their understanding.
- It would appear that, in general, older people pay less attention to date labels than younger people, they are more likely to rely on their own judgement than the date label in deciding what and when to eat and seem to treat any date label as a 'best before' guide rather than a 'do not eat this' rule.
- From a food safety perspective, the lower levels of accurate interpretation of 'use by', particularly among older people, is a cause for concern.
- From a food waste perspective, it is the incorrect interpretation of 'best before' that is a problem, since it implies that people may be discarding food earlier than necessary. The results suggest that between a quarter and a fifth of the population may be at risk of this kind of behaviour and that young people, and people more generally alert to date labels, are most likely to behaving this way.

7.3 Questions to test likely action/interpretation of date labels

The next set of questions invited respondents to look at a variety of different products to explore when, with respect to the date on the date label, they would still eat the product. A variety of products was selected for illustration, drawing upon the findings from WRAP's previous retailer research (WRAP, 2010b). Respondents were guided to ignore the brand shown to them, but the use of 'real' examples was thought essential to get close to actual, product-related behaviour.

Reflecting WRAP's previous research, certain products – notably cheese and yoghurt – were shown twice, once with 'best before' dates and once with 'use by' dates. This reflects the fact that both date types are in use and available in supermarkets, and the research sought to explore whether there are any differences in consumer responses. Note, 'display until' was not used in any of the images, with the exception of potatoes where 'display until' (shown in isolation) was given as an alternative (as uncut, fresh fruit and vegetables do not have a legal requirement to carry a 'best before' or 'use by' date, and some retailers do apply just a 'display until' date).

This section of the questionnaire also afforded the opportunity to explore whether minor variations in the presentation of dates might make any difference to consumers. The sample was thus split into three sub-groups (as explained at the beginning of this chapter) and each sub-group was shown a slightly different image e.g. 'use by', 'use by end of' or 'use by end'. Since 'best before end' is already used in some cases by manufacturers, the survey wanted to explore whether the introduction of 'end' in conjunction with 'use by' might help to reduce the 'buffer' effect (i.e. the period that consumers incorporate into their disposal decisions to 'be on the safe side').

Although the previous section identified a differential response when the 'end' word was used, in the case of the following questions **no distinguishable responses occurred** between the three sub-groups that were each shown one of the three images below. This clearly highlights the importance of context for interpretation.

In the presentation that follows, the images shown to the three sets of respondents are illustrated²⁶, followed by the results from the questionnaire.

²⁶ Note that the images were presented in a larger format than presented here to ensure respondents were able easily to read the labels.

Figure 20 Images used for cheddar cheese

The three images show 'use by', 'use by end of' and 'use by end' dates.

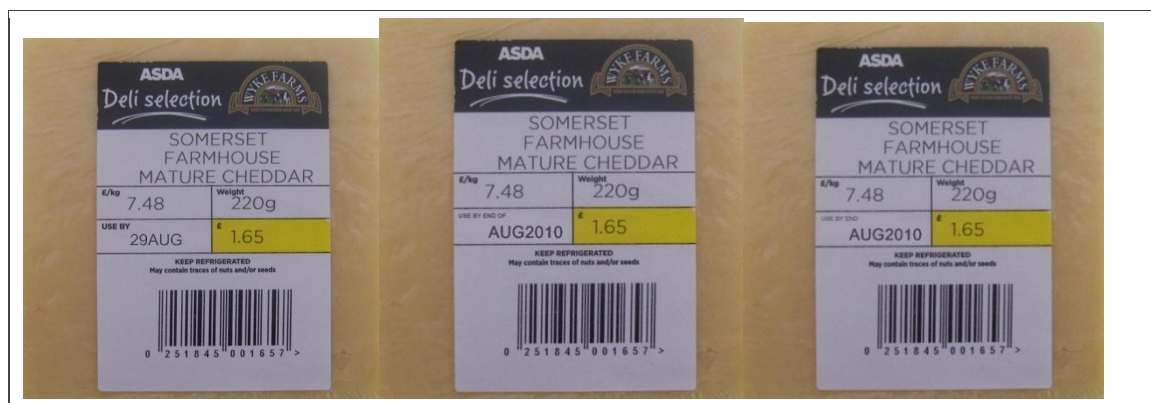
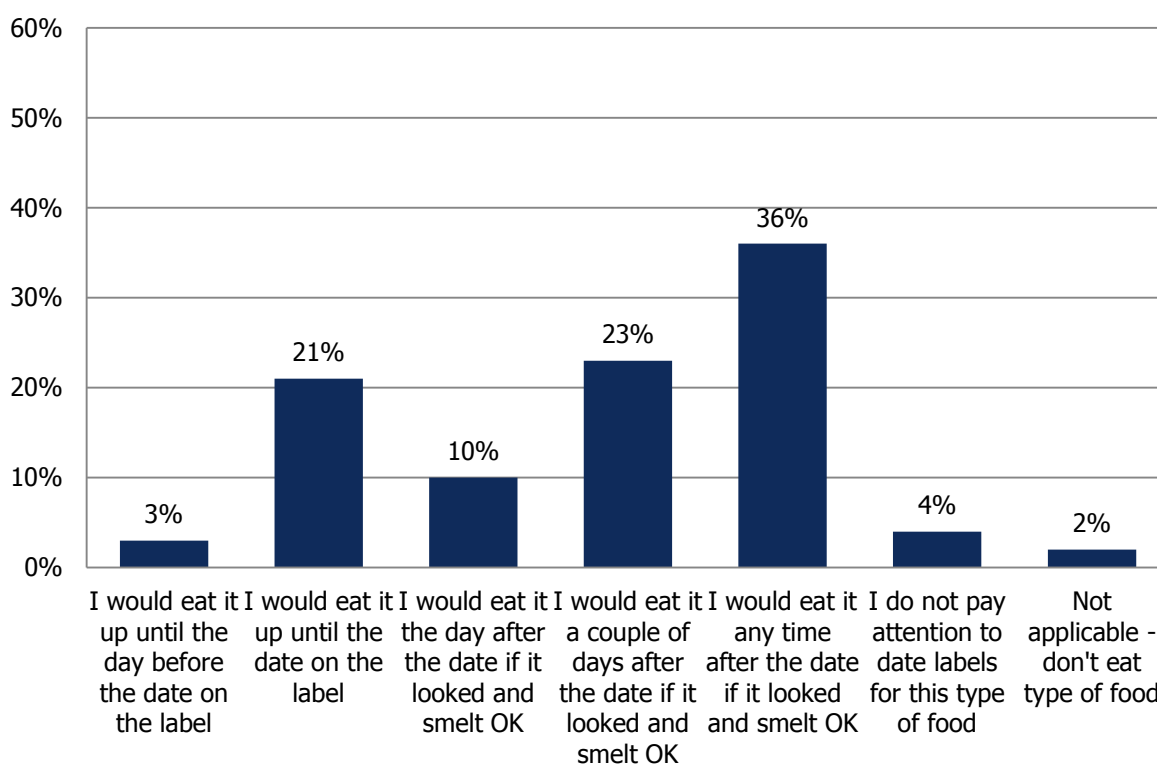


Figure 21 'When would you be happy to eat...?'- Results for cheddar cheese ('use by') (QB2)

NB. Given no distinguishable responses occurred between the three images, results have been combined.



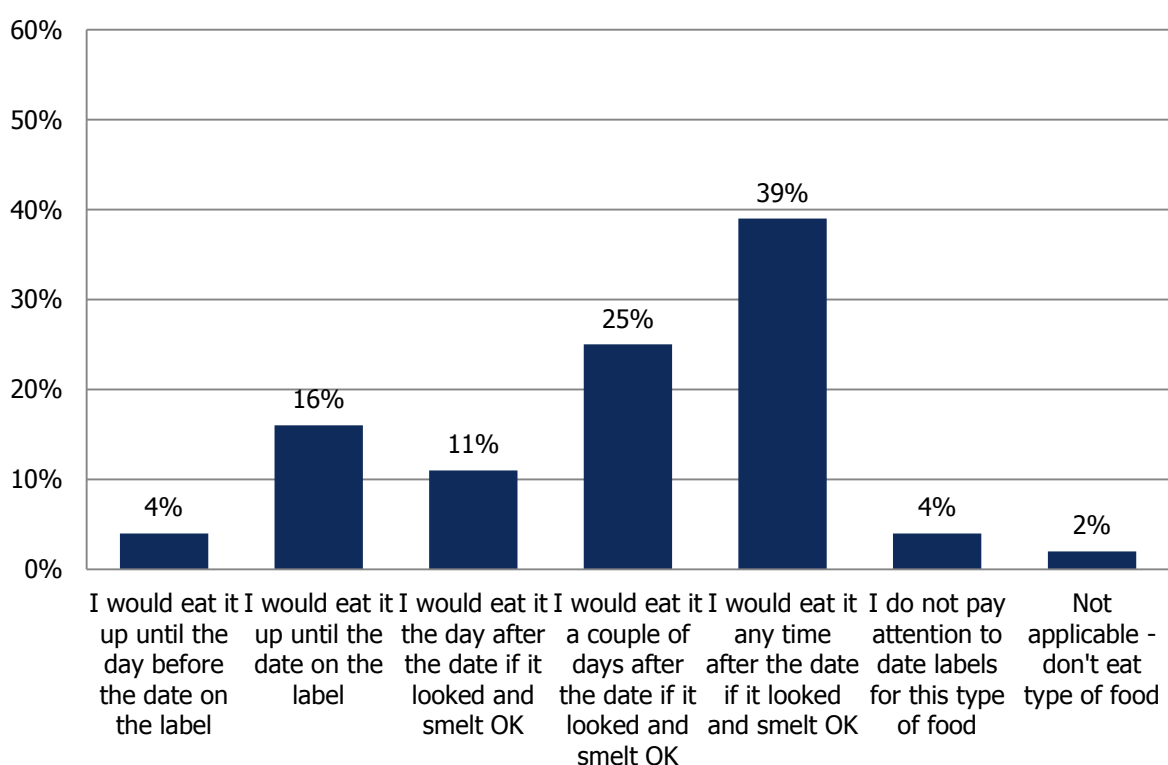
The survey suggests that more than half of respondents would eat cheddar cheese well after the 'use by' date, with older people in particular exhibiting this pattern.

Figure 22 Images used for cheddar cheese (2)

The three date labels in the images are 'best before end of', 'best before' and 'best before end'.



Figure 23 'When would you be happy to eat...?' - Results for cheddar cheese (2) ('best before')(QB2)

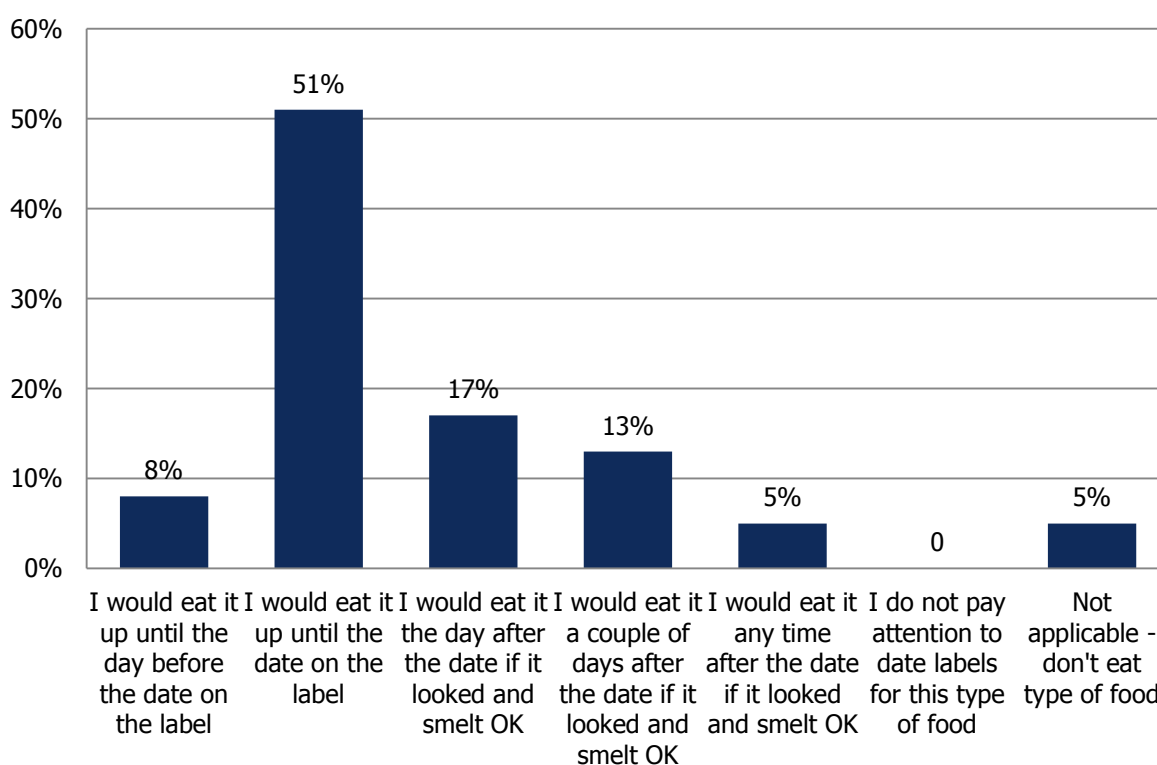


This cheddar cheese has a 'best before' label, compared to the 'use by' label for the previous cheese. The results, however, are very similar, although there is a lower proportion indicating that they would eat cheese labelled 'best before' up until the date on the label. The likelihood of older people indicating that they would eat the cheese 'any time' was slightly higher than for the previous cheese.

Figure 24 Images used for fresh chicken breast fillets
The images show 'use by end of', 'use by end' and 'use by' date labels.



Figure 25 'When would you be happy to eat...?' - Results for fresh chicken breast fillets (QB2)



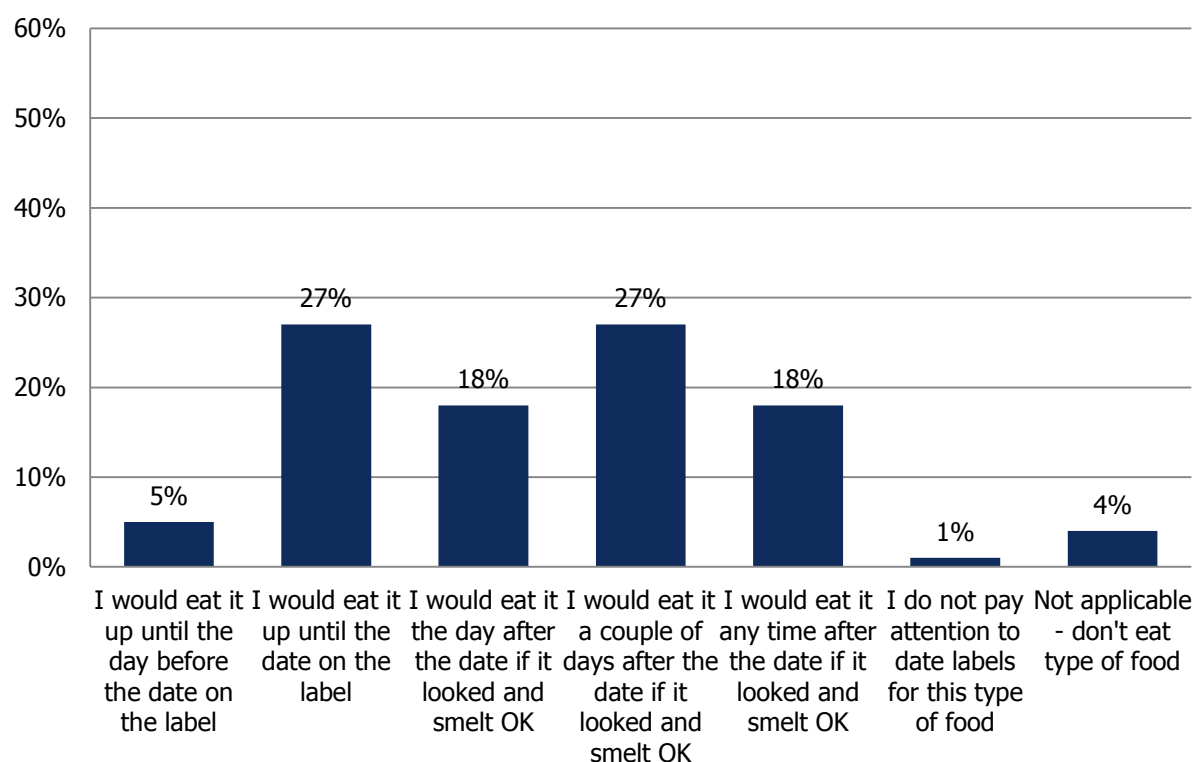
In contrast to cheese, respondents are markedly more aware of the 'use by' date in deciding when to eat fresh chicken breasts. This is a clear demonstration of the influence of product type over label type. There are few differences between those of different age or family circumstance, but of those identified as 'date label users' (as explained in section 7.2) more than 90% selected one of the first two options.

Figure 26 Images used for yoghurt

The images show 'best before', 'best before end of' and 'best before end'.



Figure 27 'When would you be happy to eat...?' - Results for yoghurt ('best before')(QB2)



Whereas chicken and cheese produced responses biased towards one or other end of the date spectrum, yoghurt prompted a more dispersed response. There was a marked age difference, with younger people much more likely to pick 'until the day before' or 'until the date', and older people much more likely to eat the yoghurt two or more days after the date shown. The distinctive reaction of 'date label users' arose again: on average, 18% of respondents indicated that they would eat the yoghurt 'any time after the date if it looked and smelt ok' – this fell to just 4% for date label users.

Figure 28 Images shown for yoghurt (2)
Date labels show 'use by', 'use by end' and 'use by end of'.

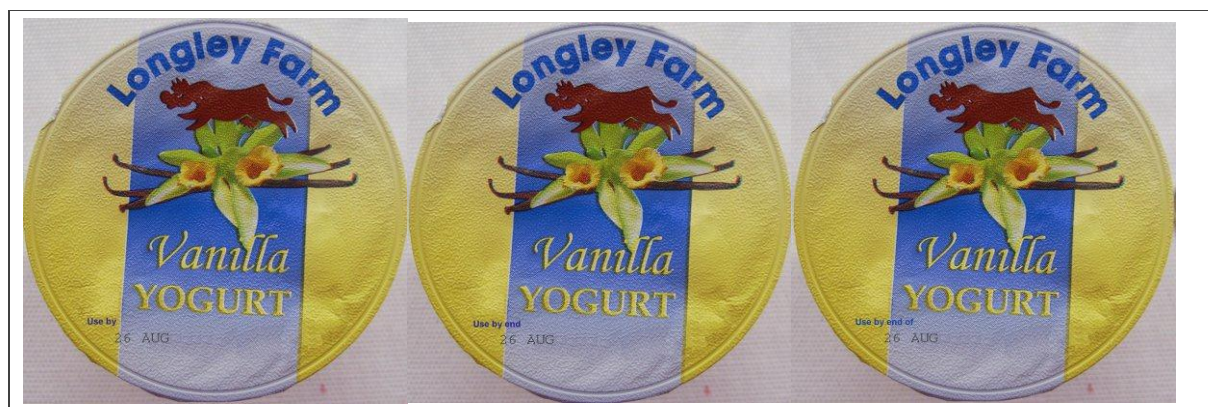
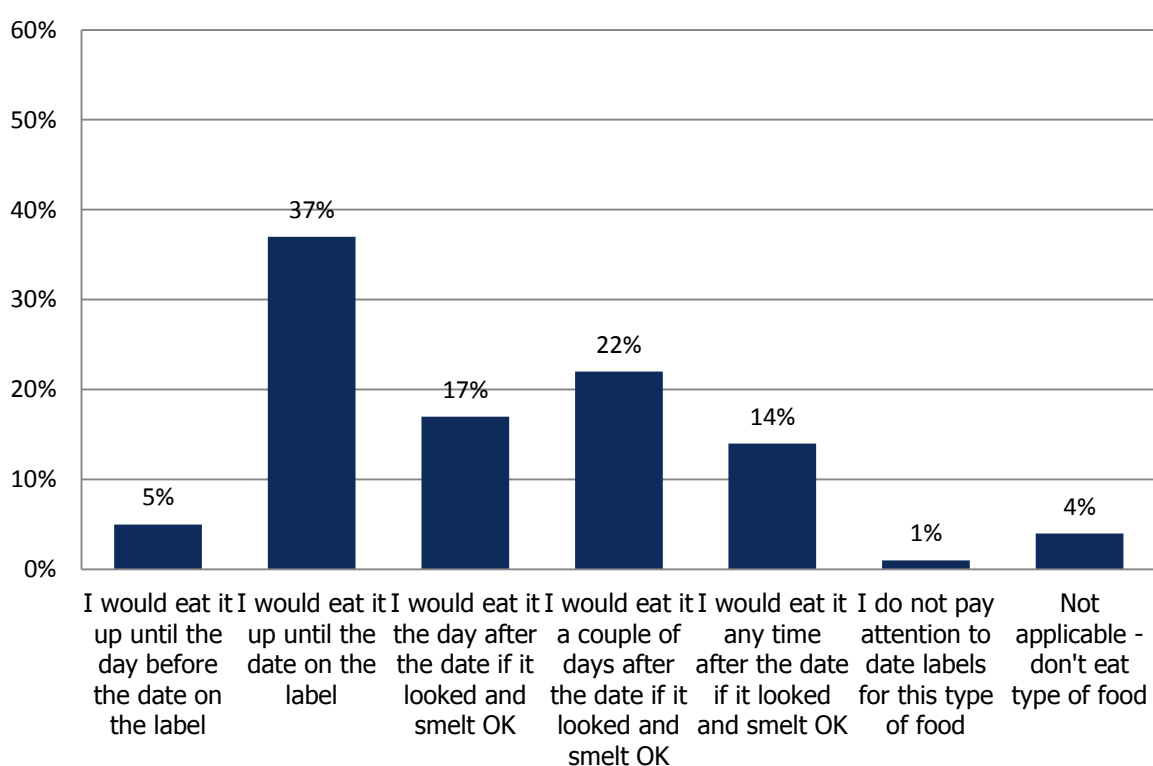


Figure 29 'When would you be happy to eat...?' - Results for yoghurt (2) ('use by') (QB2)



These yoghurts, presented with a 'use by' date, prompted a different profile of responses than the previous yoghurt (which had variations of a 'best before' date). In this case, the proportion indicating that the date on the label acted as a limit was 10% points higher – 37% vs. 27%. Comparing this with cheese – where only a small difference emerged (between cheese with a 'best before' and cheese with a 'use by' date) further highlights the subtleties of date label use: not only is there differential reliance on date labels between different products (as these various profiles have demonstrated) but there is also discrimination between date labels depending upon the product on which they appear.

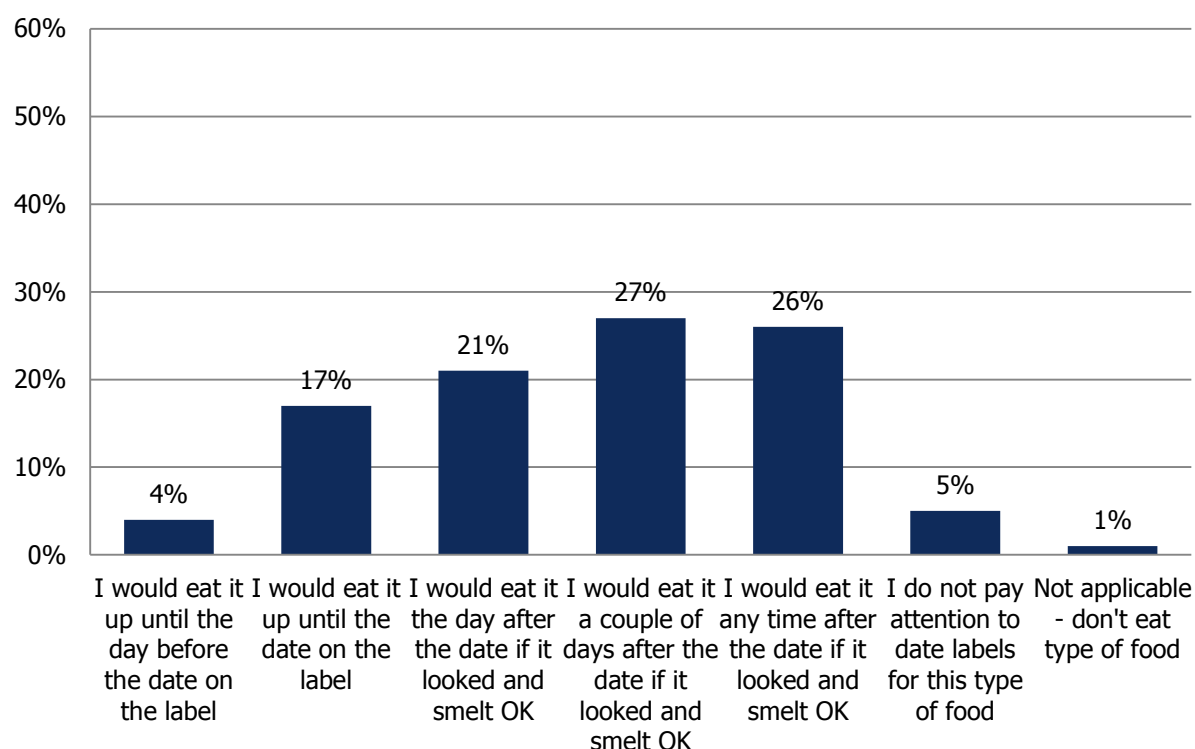
Further variation followed the familiar patterns of age and 'date label user'.

Figure 30 Images shown for bread rolls

Images show 'best before end', 'best before' and 'best before end of' date labels.



Figure 31 'When would you be happy to eat...?' - Results for bread rolls (QB2)



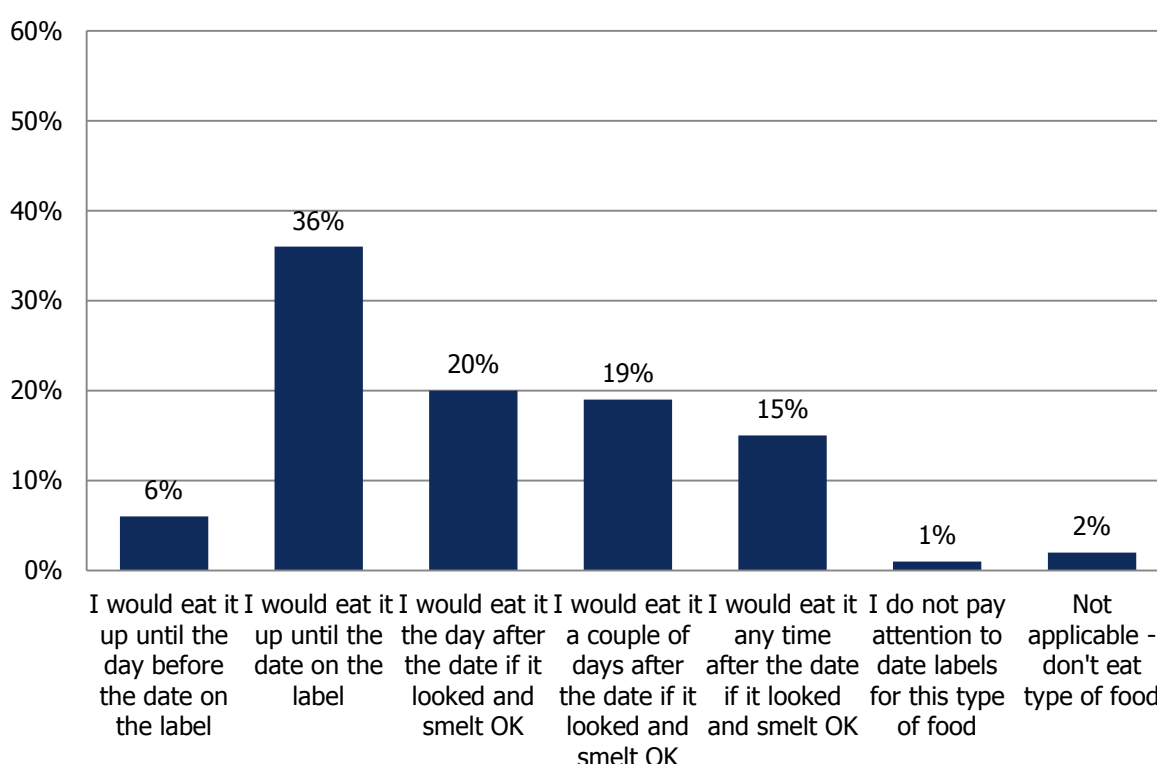
In the case of bread rolls respondents indicated a bias towards the 'so long as it looked and smelt ok' in their responses, though not to the same degree as for cheese. There were no significant variations between different groups of the population, though, as before, date label users were generally much more cautious than non-users ('I would eat it any time' ranged from 9% for users, to 47% for non-users).

Figure 32 Images used for milk

The date labels show 'use by end', 'use by' and 'use by end of'.



Figure 33 'When would you be happy to eat...?' - Results for milk(QB2)



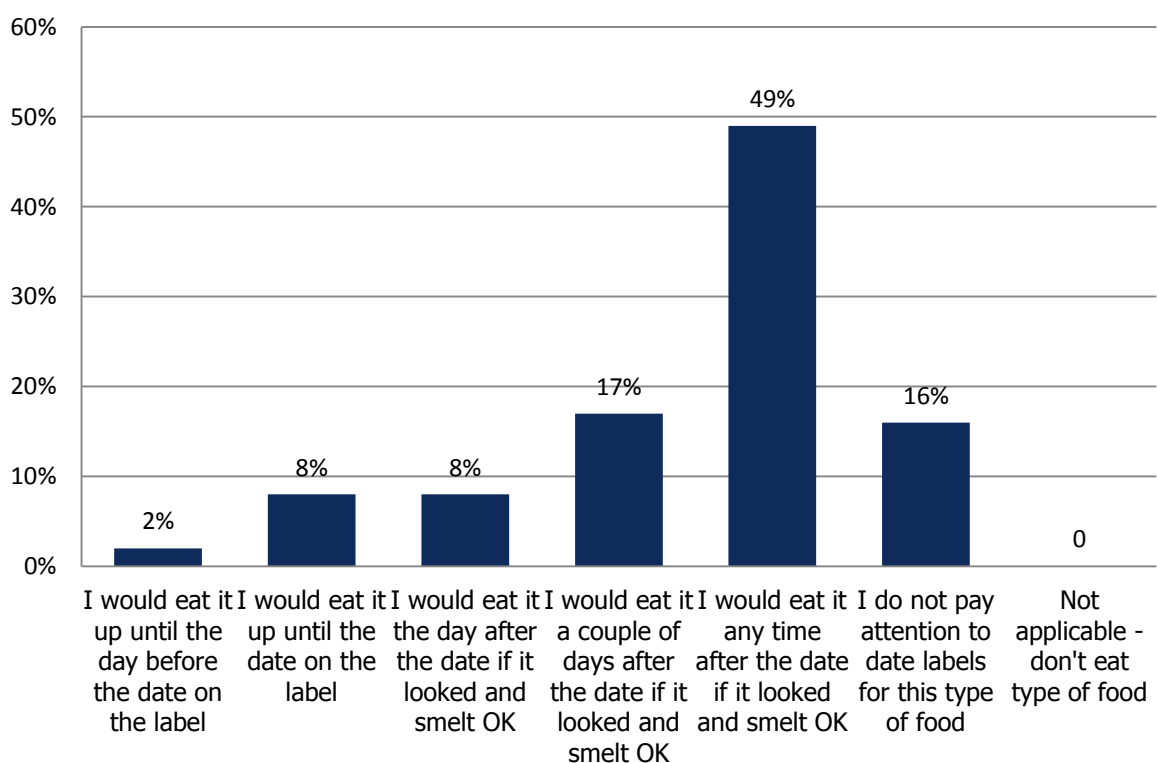
Milk – shown with variations of a 'use by' date – prompted a relatively high proportion of respondents to indicate that they would consume it up to, and including, the date shown (42%) but considerable numbers nevertheless indicated their willingness to use sensory information beyond the 'use by' date. Younger people were much more likely to be towards the left hand side of the chart than older people and households with children, too, were more likely to rely on the date label to determine whether or not to use the milk.

Most dramatically, only 2% of those identified as 'date users' indicated that they would drink the milk two or more days beyond the date if it looked and smelled ok, compared to 66% of non-users.

Figure 34 Images shown for potatoes²⁷



Figure 35 'When would you be happy to eat...?' - Results for potatoes (QB2)



Using date labels to decide when to eat potatoes is a minority behaviour: around two thirds of respondents indicated either that they simply don't pay attention to dates on potatoes or would eat them irrespective of the date so long as the potatoes looked and smelled ok. Young people exhibited a more suppressed version of the same pattern (a preference for relying on dates, indicating lack of confidence/experience/wisdom) and 'date label users' comprised almost the entire population of respondents indicating that they would eat potatoes up to or including the date on the label.

²⁷ The three date labels read 'display until', 'best before end' and 'best before'.

7.3.1 Comparison of the results

Figure 36 Comparison: "I would eat it up until the date on the label" (QB2)

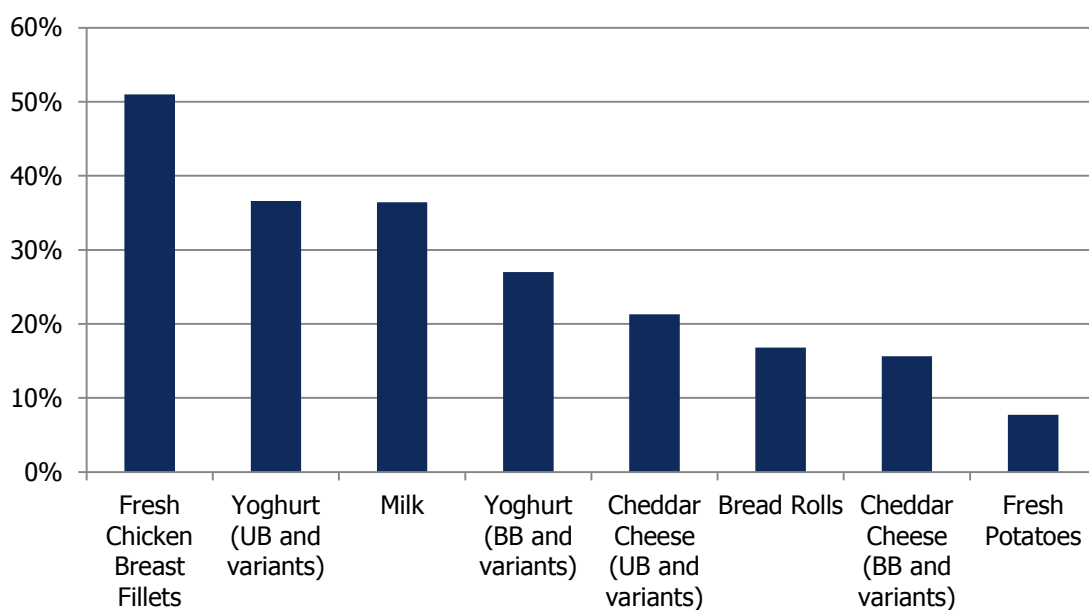


Figure 37 Comparison: "I would eat it a couple of days after the date if it looked and smelt OK" (QB2)

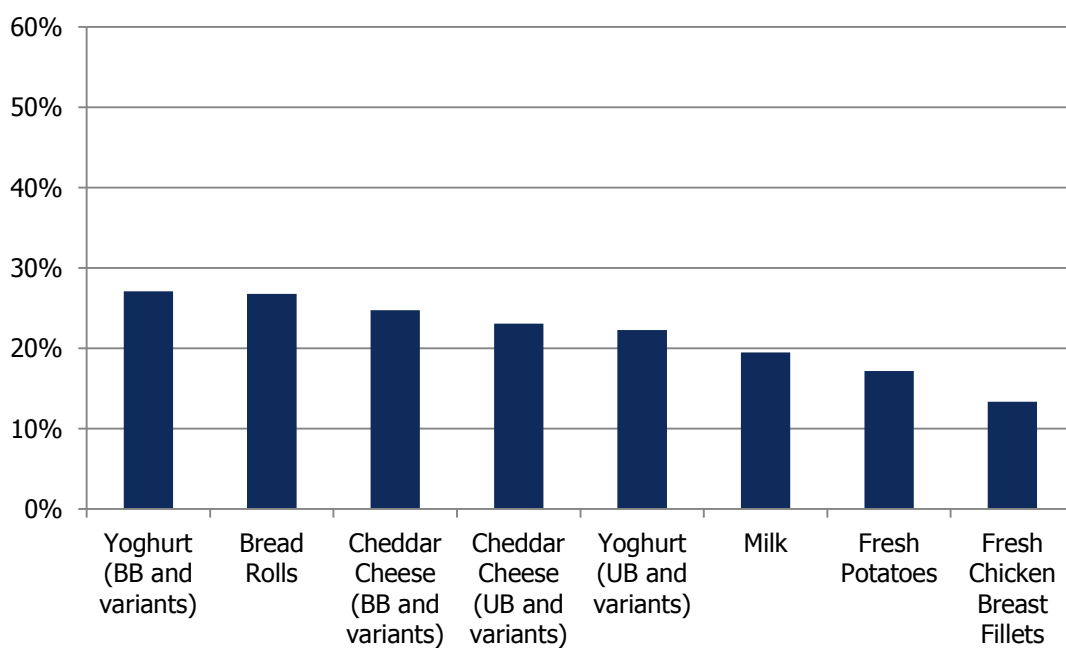
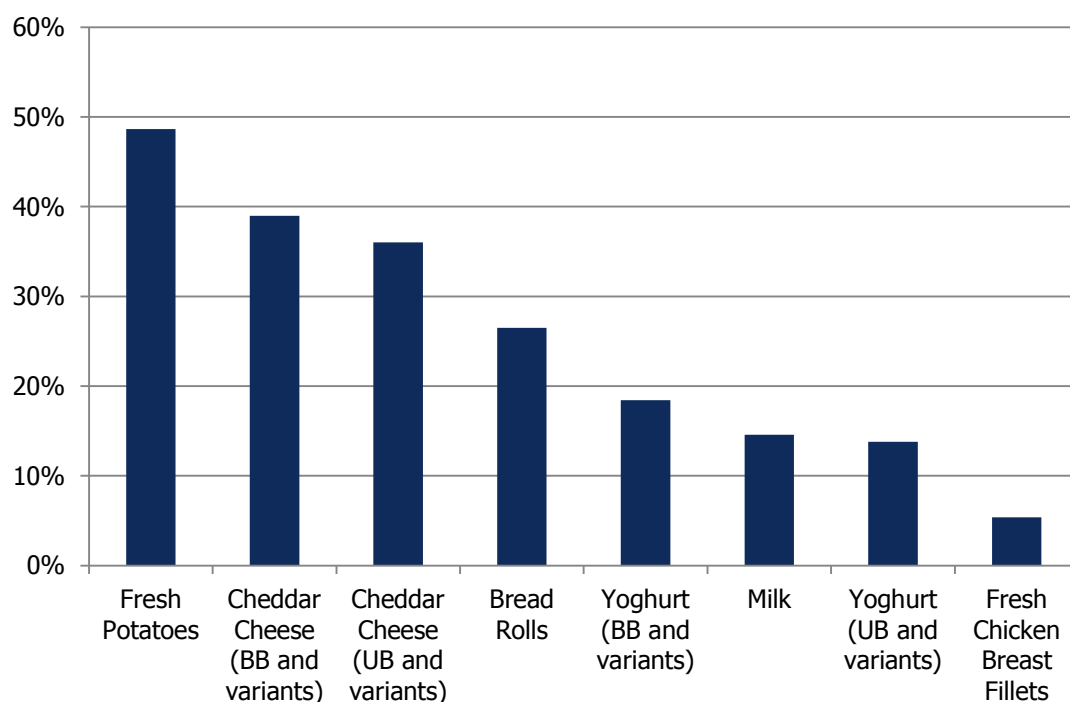


Figure 38 Comparison: “I would eat it any time after the date if it looked and smelt OK” (QB2)



Overall, the results show a use of date labels guided by four main axes:

- **Safety** – products such as chicken are eaten with much greater regard for date labels than products (such as cheese and potatoes) where decay is visible and/or where the food safety risk is considered to be lower
- **Age** – older people are, in general, much more likely to rely on their senses in deciding whether or not to eat something compared to younger people.
- **Date label use profile** – on the basis of a simple classification (explored in much more depth in section 3) individuals inclined to pay close attention to date labels are not only more likely (than average) to treat all labels as meaning ‘use by’ (as we saw earlier) but are also more likely to use the date label (any date label) as the basis for their eat/don’t eat decision.
- **Context** – comparing results for ‘use by’ and ‘best before’ pairings of yoghurt and cheese – which showed a more pronounced difference in response between the two dates for yoghurt than for cheese - highlights the fact that respondents’ reliance on a particular date label (‘use by’ vs. ‘best before’) is itself influenced by the product on which the date appears, not merely the date in isolation.

7.4 Determining how decisions are made

So as to further explore the means by which people reach judgments about whether or not to eat particular foods, in this section respondents were asked – without using images – ‘How do you decide whether to eat or to throw away this product?’ (Table 20).

Table 20 How do you make decisions about when to eat or throw away? (% of 2,008 responses)

Criteria	Cheese ²⁸	Chicken	Yoghurt	Bread rolls	Milk	Potatoes
I rely entirely on the date given on the pack	7	33	17	5	18	3
I rely mostly on the date given on the pack	12	30	22	9	22	4
I rely on a mixture of the date and my own judgement	42	25	42	41	39	22
I rely mostly on my own judgement	27	6	13	32	15	39
I rely entirely on my own judgement	11	1	2	12	5	31
I never buy this	2	5	4	1	1	1

The results reinforce and confirm the findings from the previous section. There is a clear ‘typology’ of product – with chicken and potatoes at the extremes (heavily dependent on the date label and heavily dependent on judgement, respectively), bread and cheese treated similarly to one another, and yoghurt and milk treated similarly to one another.

²⁸ In this question no distinction was made between cheese with a ‘use by’ or a ‘best before’ date, and similarly for yoghurt. It was judged, in developing the questionnaire, that the question could not reasonably be asked in this format with these factors included.

7.5 Determining the impact of label changes

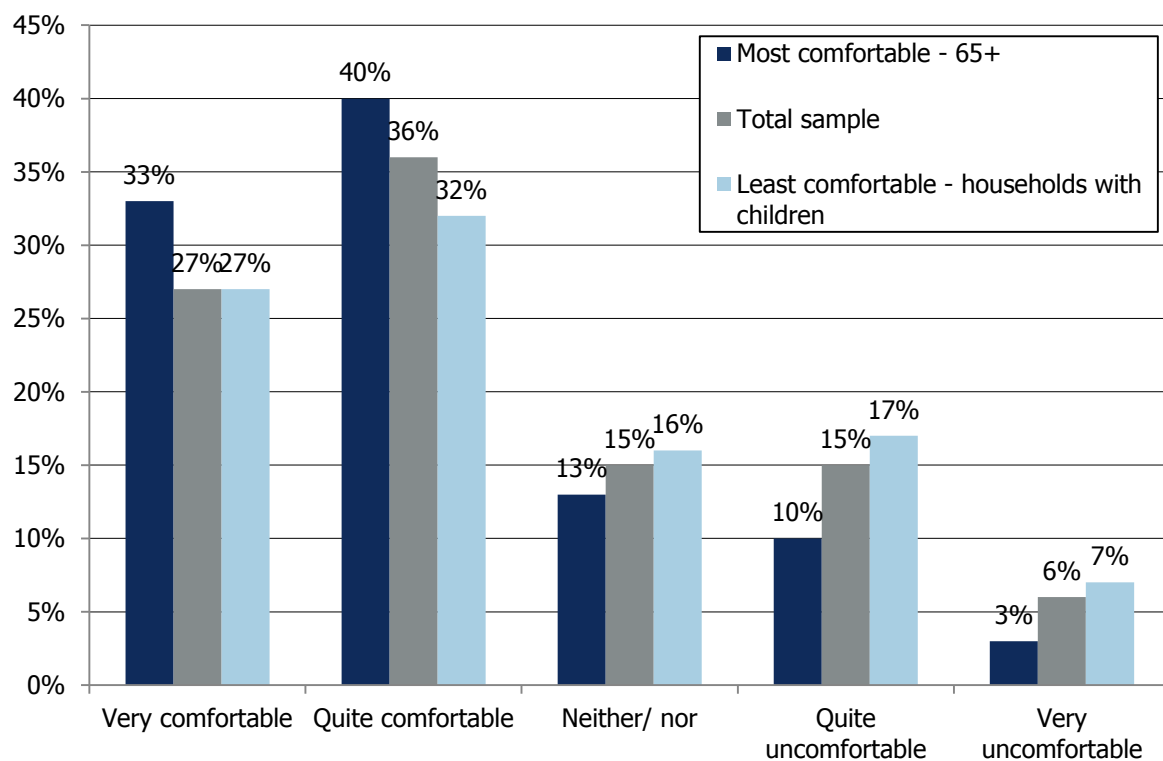
7.5.1 Removal of date labels

In this section, respondents were asked:

"Some retailers are thinking about removing date labels from fresh produce such as carrots, apples and potatoes. How comfortable or uncomfortable would you be buying fresh fruit and vegetables if they did not have a date label?"

The chart below shows the average answers given for the whole sample of 2,008 plus the results for the 'most comfortable' segment (those aged 65+) and the least comfortable (households with children).

Figure 39 How comfortable would you be buying fresh fruit and vegetables if they did not have a date label? (QB3b)



The chart shows clearly that the majority of consumers are comfortable with this idea and the variation between extremes is relatively modest.

7.5.2 Choosing one label format over another

Respondents were asked which label they found *most useful*. The responses can be used alongside the findings from earlier questions on understanding to build a picture of what effect, if any, changes to labelling might have on consumer behaviour.

This question was asked separately from the earlier date label questions (to avoid answers being unduly influenced by the previous questions) and, for this reason, are presented separately too. Importantly, respondents were not able to give multiple answers, as in the earlier questions: they were asked to pick the single label they considered more useful (Table 21).

Table 21 Preference responses for 'use by' date labels (QB4a)

'Use by' label	Proportion saying 'most useful'
<div>Use By</div> <div>27 AUG 2010</div>	25%
<div>Display Until</div> <div>25 AUG 2010</div> <div>Use By</div> <div>27 AUG 2010</div>	24%
<div>DISPLAY UNTIL</div> <div>25 AUG 2010</div> <div>USE BY END</div> <div>27 AUG 2010</div>	21%
'No preference'	14%
<div>Use By End</div> <div>27 AUG 2010</div>	11%
<div>USE BY</div> <div>27 AUG 2010</div> <div>(2)</div>	5%

The findings reinforce the earlier results: simpler is better, the 'end' word is disliked and the presence of unfamiliar material (the '(2)') produces a strong reaction. There were no pronounced variations between different groups within the population.

Table 22 Preference responses for 'best before' date labels(QB4a)

'Best before' label	Proportion saying 'most useful'
<div> Display Until 26 AUG 2010 Best Before 28 AUG 2010 </div>	38%
<div> Best Before 28 AUG 2010 </div>	29%
<div> BEST BEFORE END 28 AUG 2010 </div>	17%
<div> "No preference" </div>	13%
<div> Best Before (2) 28 AUG 2010 </div>	2%

Compared to the results for 'use by', results for 'best before' (Table 22) produced a stronger result, with 'best before' in conjunction with a 'display until' date the clear favourite. This suggests that the 'display until' date may be valued by consumers in making their freshness/shelf-life calculations, or it may be seeing the two dates together may be more familiar. As previously, however, the 'end' word appears to be disliked and the hidden code appears deeply unpopular. Again, differences between segments were muted.

7.6 Questions to test the use of storage guidance

Previous research (WRAP 2010b) has shown that there is often variation in the 'Once opened, use within x days' guidance. It has been suggested that this variation may lead to confusion in the minds of consumers about which guidance is 'correct', or may encourage them to default to a shorter period within which a product is treated as edible.

To explore this issue, respondents were shown images of a series of products that had been identified in the earlier research (WRAP, 2010b) as having variable 'Use within...' guidance; sliced ham, milk and ambient pasta sauce. Given differences in the length of time that the product shown should be used, respondents were asked to indicate which they would prefer to buy. (Respondents could have chosen a shorter period in the belief that this would be consistent with greater freshness and/or improved safety, or may have chosen a longer period in the belief that this would increase the amount of time for which the product would be available to eat without there being a loss of freshness and/or a safety risk.)

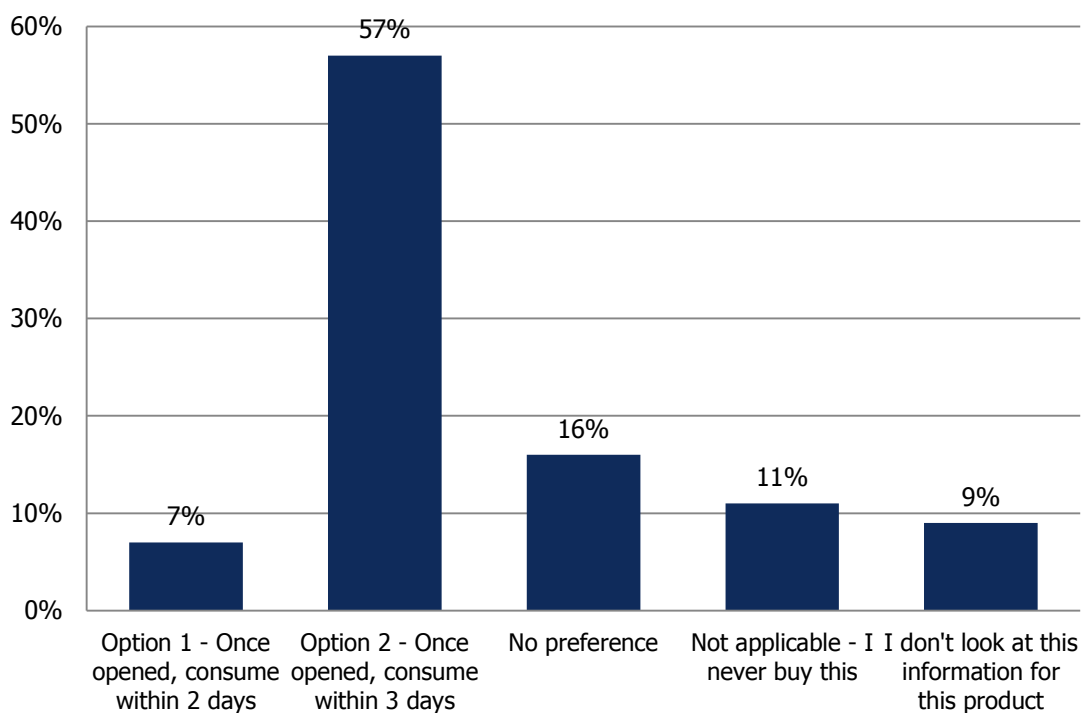
Figure 40 Images shown for cooked ham

The two labels read 'Once opened, consume within 2 days' and '...within 3 days'.

WRAP's 2009 research found that 79% of sliced ham stated use within 2 days and 15% within 3 days (2010b).



Figure 41 Results for cooked ham (QC1)



Perhaps unsurprisingly, the majority of respondents indicated that they would prefer to buy ham with a longer time available in which to eat it. Younger people were a little more likely than older people to express this view, but there were no other variations of significance.

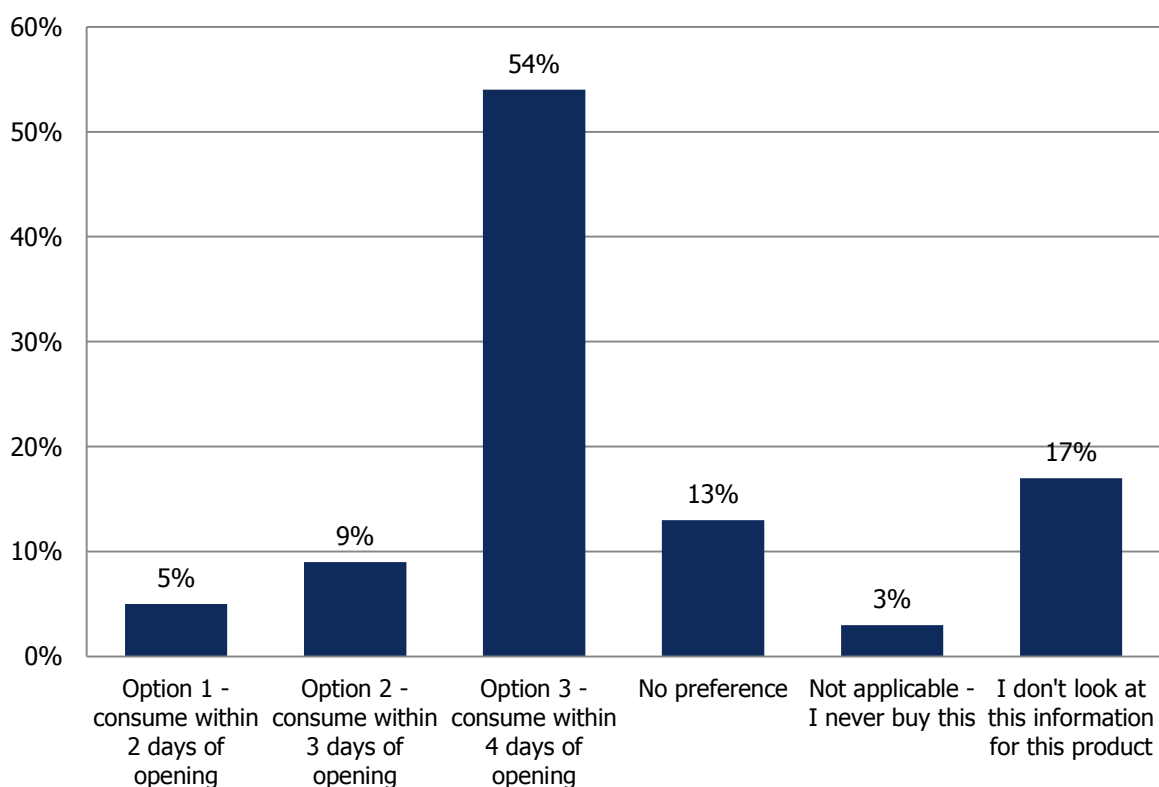
Figure 42 Images shown for milk

The three labels indicated that the milk should be consumed within 2, 3 and 4 days.

WRAP's 2009 research found that 9% of milk packs stated use within 2 days and 68% within 3 days (2010b).



Figure 43 Results for milk (QC1)



As for ham, respondents showed a marked preference for milk that, according to the label, would last longer in their fridge. (Whether this preference would be expressed at the point of purchase, or whether a product with a longer in-home life would indeed be less likely to become waste is not tested through this survey, but the issues raised are discussed elsewhere in the report.) As with the ham, younger people were a little more likely than older people to express this preference.

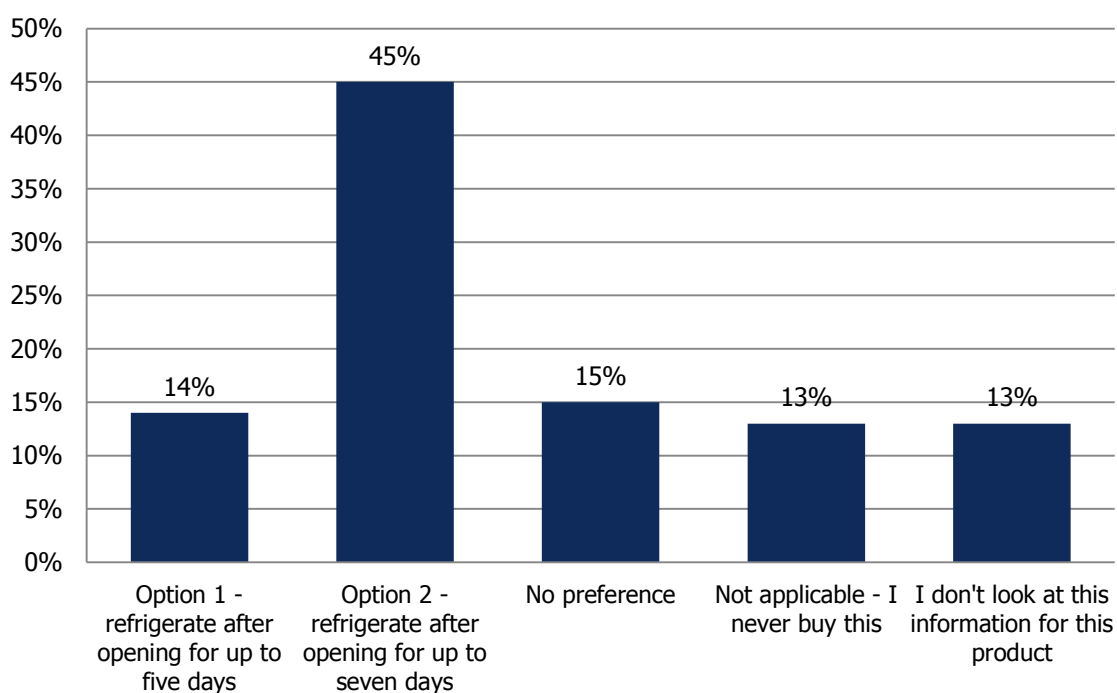
Figure 44 Images shown for pasta sauce

The two labels read 'Refrigerate after opening for up to five days' and '...for up to seven days'.

WRAP's 2009 research found that 81% of ambient cooking sauce stated use within 3 days and 3% within 2 days (2010b), 3% within 5 days, 2% within 2-3 days and 2% within 7 days.



Figure 45 Results for pasta sauce (QC1)



The common sense answer remains popular for pasta sauce, though to a lesser extent than for ham or milk. The age bias is more pronounced, however, with 60% of 18-24 year olds selecting Option 2 (a longer life) compared to 34% of the 65+ group. No other significant differences in response occurred.

7.6.1 Use and understanding of freezing guidance

Turning to guidance on freezing, respondents were shown two similar logo images and asked: have you seen this; which do you think is most useful; and what does it mean?

Table 23 Logos (QC2a)



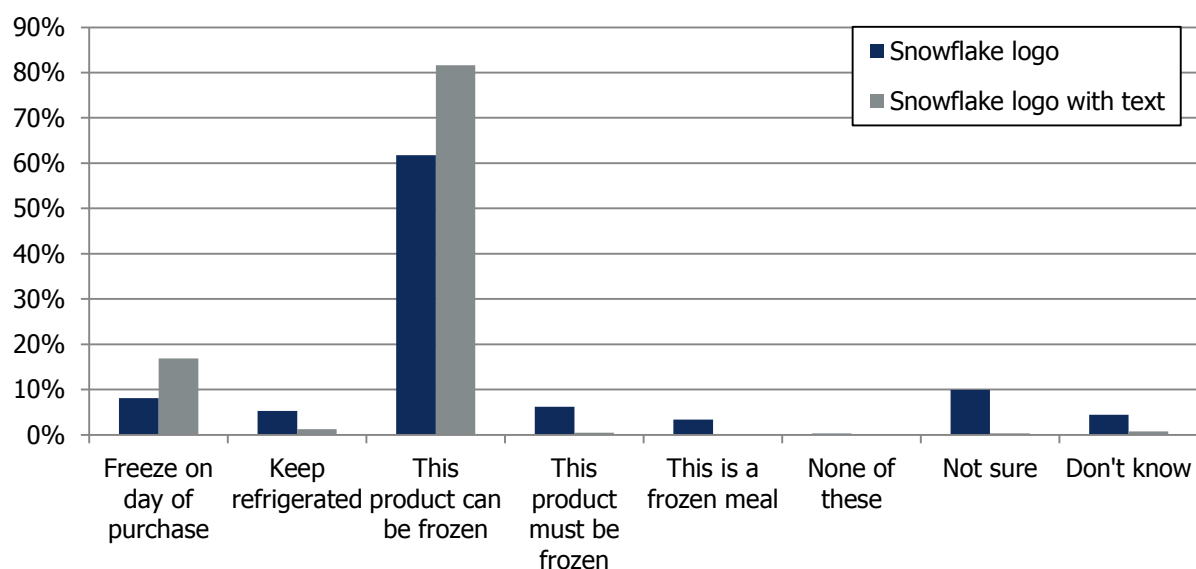
Logo	Proportion saying they had seen this logo (%)	Proportion selecting logo as 'most useful' (%)
	91	1
	74	89
No preference	-	10
Don't know	-	1

Figure 46 What do you think this logo means? (QC2b)



A clear majority had seen the snowflake on its own and a large (though smaller) proportion had seen the logo with accompanying text. Younger people had higher recognition than older people.

The introduction of accompanying text had a clear impact, with a higher proportion indicating that “This product can be frozen” (an increase from 62% to 81%) and the near complete elimination of erroneous and uncertain responses (“This product must be frozen”, “This is a frozen meal” etc.). The text did, however, prompt an increase in the proportion of respondents believing that the label implied that they should freeze the product on the day of purchase. This most likely reflects the prevalence of ‘freeze on day of purchase’ guidance (and is discussed in the next section).

Though the introduction of text might not necessarily be thought of as ‘simpler’ it is obviously ‘clearer’ for respondents: 89% of respondents considered it ‘most useful’ compared to just 1% claiming the same for the logo on its own.

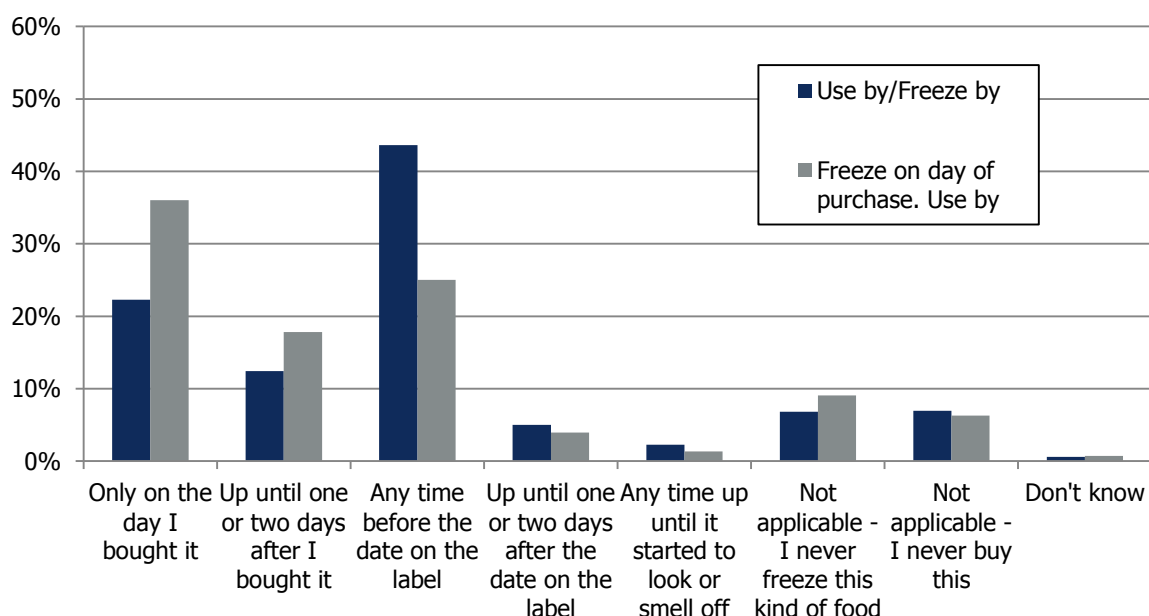
As previous research (e.g. WRAP 2010a) and earlier phases of this research (section 5.6) have indicated, there appears to be considerable confusion among consumers about what can and cannot be frozen and, more especially, when it can be frozen. It has been suggested that clearer guidance – notably, guidance that explains to consumers that a product can be frozen not merely on its day of purchase but any time before its ‘use by’ or ‘best before’ date – may improve consumers’ freezing behaviour and could thus contribute to a reduction in unnecessary food waste. The next part of the survey sought to test this.

Figure 47 Images shown for bacon

The two labels read i) 'Freeze on day of purchase' and a 'use by' date ii) A 'use by/Freeze by' date²⁹.



Figure 48 'Please indicate when you would be happy to freeze this product' (QC3)



Some of the sample were shown bacon carrying distinct 'freeze on day of purchase' and 'use by' information (the image on the left) while the remainder of the sample was shown bacon bearing a 'freeze before / use by' date.

The impact of this change is clear: the introduction of the 'freeze before / use by' label produces a marked fall in the proportion of respondents indicating they would 'Freeze the product on day of purchase' and a marked increase in the proportion saying 'Any time before the date on the label'.

Caution does need to be taken in translating this finding: as we have already seen, the presence of confounding information, or the relationship between a particular type of date and a particular type of product, or the extent to which a particular consumer 'relies' on date labels³⁰ could all influence this finding; but the impact, in isolation, is striking.

²⁹ Note: the survey was tested with 'freeze by / use by' and 'freeze before / best before' labels, but following industry feedback WRAP guidance has been amended to 'freeze before / use by'.

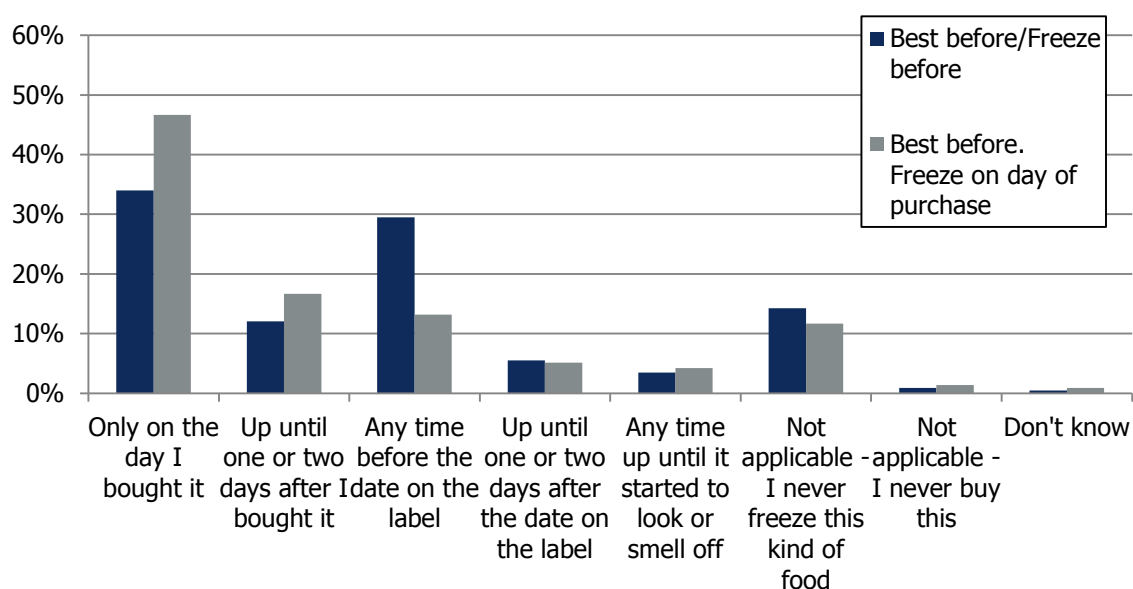
³⁰ Note: the structure of the survey sample means that comparison between sub-groups is not possible for this suite of questions.

Figure 49 Images shown for bread rolls

The two labels read i) 'Best before'/Freeze before ii) A 'best before' date and 'freeze on day of purchase'.



Figure 50 'Please indicate when you would be happy to freeze this product' (QC3)



As with bacon, a similar pattern of response was evoked: the 'best before/freeze before' model produced a lower proportion citing 'Only on the day of purchase' and a higher proportion citing 'Any time before the date on the label'.

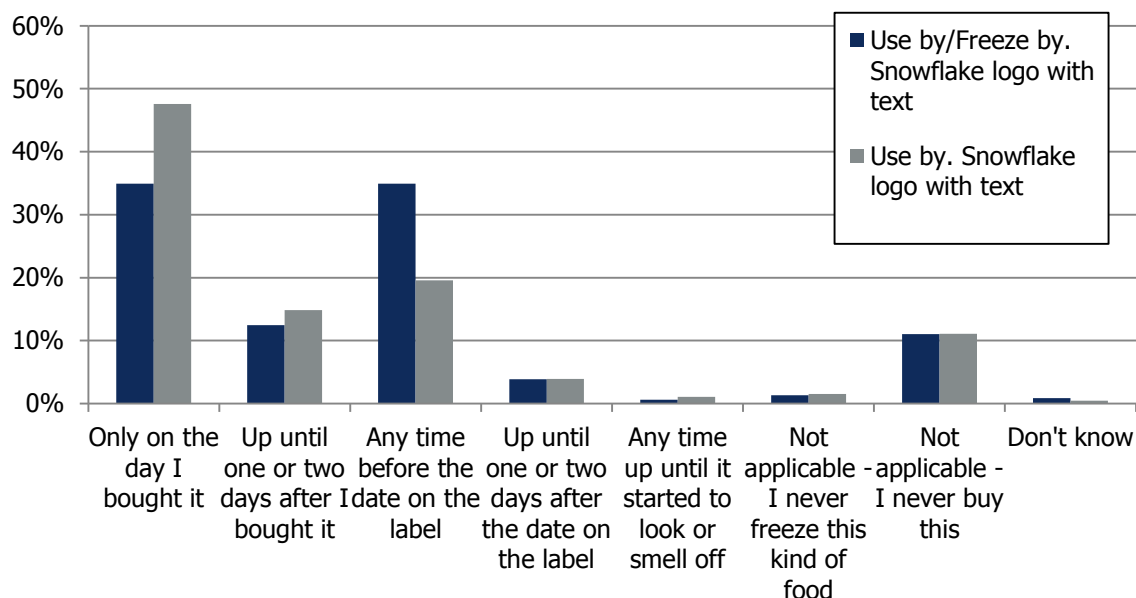
The result is not as strong as for bacon, however, since even with the 'best before/freeze before' label around a third of respondents would still 'freeze on day of purchase'. This reflects the importance of 'freshness' and quality of bread for consumers, and again highlights the relationship between date and product.

Figure 51 Images shown for ready meals

The two labels read i) 'Use by'/Freeze by date, with the snowflake logo with 'Suitable for home freezing' text.
ii) A 'use by' date, snowflake logo with 'Suitable for home freezing' text and 'freeze on day of purchase' labelling.



Figure 52 'Please indicate when you would be happy to freeze this product' (QC3)



Results for ready meals continue the pattern shown by bread and bacon. In the absence of information to the contrary, nearly half the sample indicated that they would 'Freeze only on the day of purchase' when confronted with a 'use by' date and 'freeze on day of purchase' text. When presented with a 'freeze before / use by' date, this proportion fell markedly and there was a near doubling in the proportion indicating that they would freeze the product 'Any time before the date on the label'.

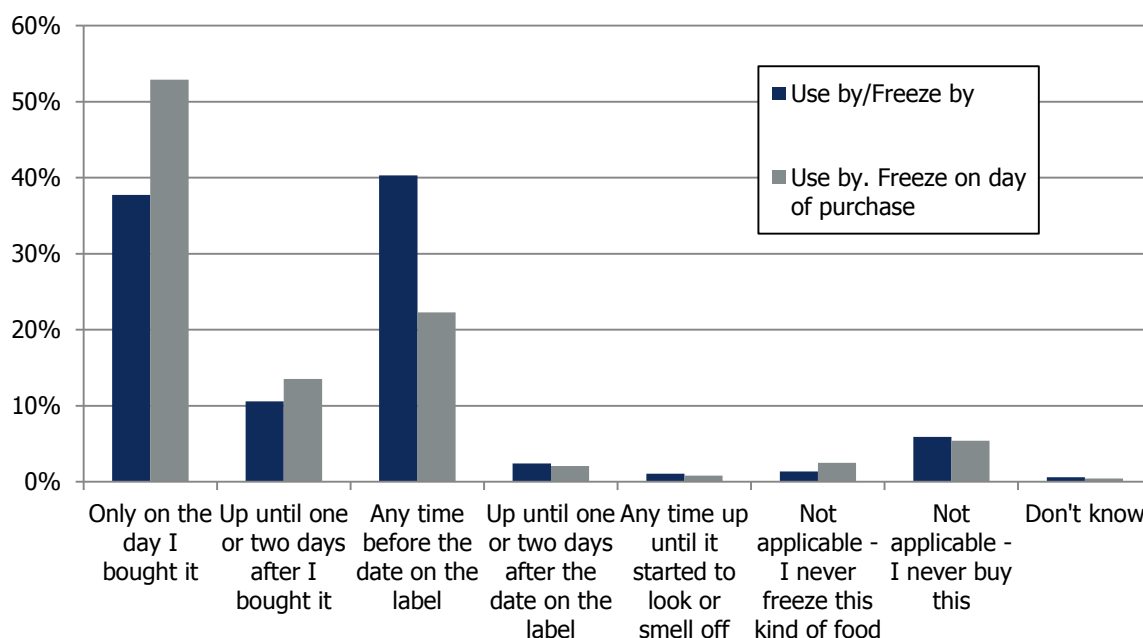
It needs nevertheless to be noted that the proportion indicating they would 'Freeze on day of purchase' remains more than a third even with the new label perhaps reflecting purchase habits (i.e. buying in bulk to freeze at home).

Figure 53 Images shown for fresh chicken breast fillets

The two labels read i) A 'use by' date with 'freeze on day of purchase' ii) A 'use by'/Freeze by date.



Figure 54 'Please indicate when you would be happy to freeze this product' (QC3)



The results for chicken echo those for other products: the introduction of the 'freeze before / use by' date causes a decline in the proportion selecting 'Freeze only on the day of purchase' and a sharp rise in the proportion choosing 'Any time before the date on the label'.

Variation between the four products for which this label was tested seems to reflect variations in the way these particular foods are conceptualised by consumers: it would seem that safety-related sensitivities about chicken are different from those concerning other products and these sensitivities influence how labels, and changes to labels, are interpreted.

7.6.2 Other storage guidance

In the final set of questions, and to further consider how consumers make their storage decisions, respondents were asked: how do you decide where to store foods (Figure 55) and, among a variety of locations in which tips and guidance on storage could be provided, which would be most useful? (Figure 56)

Figure 55 How do you decide where to store foods? (select up to two) (Q4a)

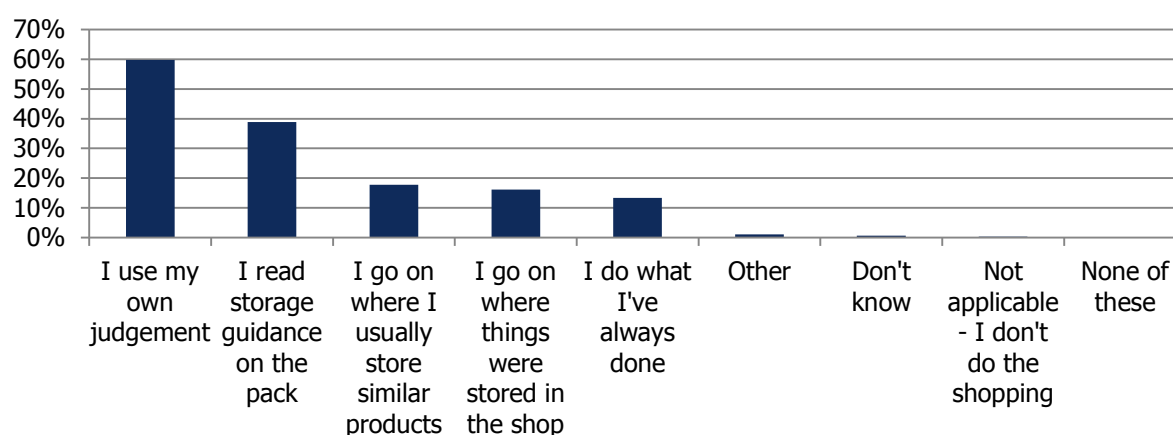
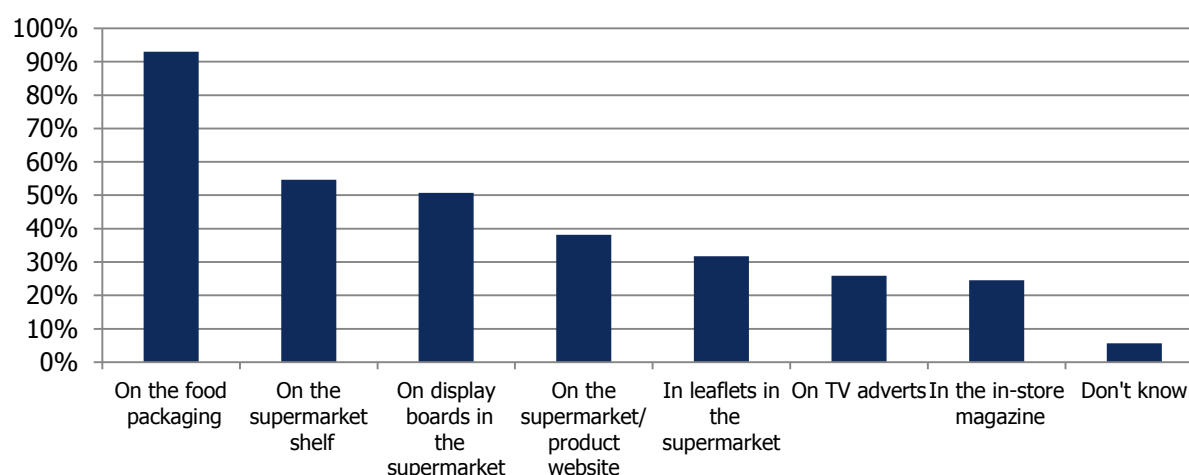


Figure 56 Possible places where tips and guidance could be provided. How useful would it be? (combined 'very useful' and 'quite useful') (Q4b)



Respondents were able to select more than one option when asked how they make decisions about where to store food and 6 in 10 respondents selected 'I use my own judgement'. There was relatively little variation between different subsets of the population, though women were more likely to choose this option than men (64% vs. 56%, perhaps reflecting their greater confidence with food).

'Date users' (specified as per section 7.2) were the only group not to select 'I use my own judgement' as the top-ranked option: 55% of this group chose 'I read the storage guidance on the pack'. All other groups in the population chose this option as the second most popular and there was little variation among groups from the average of 39%.

With other options having attracted only limited interest, the results suggest that consumers rely on their own judgement to a significant extent, but clearly make use of the guidance on product labels in support of that judgement.

This view is reinforced by the results from the final question (Figure 56). The huge majority of respondents (>90%) indicate that they would find storage guidance or tips on-pack to be 'useful' or 'very useful'. Reasonable proportions (>half) also thought that 'On display boards in the supermarket' or 'On the supermarket shelf' would also be 'useful' or 'very useful', other options were less popular. There were few significant variations among different groups within the population.

The inference is clear: consumers would like storage guidance to be as close as possible to the product, so that if they wish to use it as part of their decision-making, they can.

7.7 Summary

These survey findings have provided a wealth of valuable insight into the attitudes and perspectives on date label and storage guidance of a large UK-representative sample (>2,000).

In terms of the *understanding* of date labels, the survey reveals:

- 'Display until' dates appear familiar to, well understood and accurately interpreted by the overwhelming majority of respondents.
- 'Best before' dates are also well understood and familiar in general: however, the presence of other information and/or dates (i.e. 'display until') acts to reduce accurate interpretation, in some cases markedly.
- Older people are more likely than younger people to interpret 'best before' accurately.
- Although 'use by' dates are familiar and are reported as, by and large, 'easy' or 'very easy' to understand, they are the dates that are most likely to be incorrectly interpreted. Again, the presence of other information and/or dates (i.e. 'display until') acts to reduce accurate interpretation, in some cases markedly.
- Older people are more likely than average to interpret 'use by' incorrectly.
- It would appear that, in general, older people pay less attention to date labels than younger people and seem to treat any date label as a 'best before' guide rather than a 'do not eat this' rule.
- From a food waste perspective, the incorrect interpretation of 'best before' implies that people may be discarding food earlier than necessary. The results suggest that between a quarter and a fifth of the population may incorrectly interpret 'best before' and that young people, and people more generally alert to date labels, are most likely to be behaving this way.

In terms of how date label information is used to decide whether or not something should be eaten, the results show that respondents rely on a mix of their own judgment and the information on the date label. The balance between these two seems to vary along four axes:

- **Safety** – products such as chicken are eaten with much greater regard for date labels than products (such as cheese and potatoes) where decay is visible and/or where the food safety risk is considered to be lower.
- **Age** – older people are, in general, much more likely to rely on their senses in deciding whether or not to eat something compared to younger people.
- **Date label use profile** – on the basis of a simple classification, individuals inclined to pay close attention to date labels are not only more likely (than average) to treat all labels as meaning 'use by' but are also more likely to use the date label (any date label) as the basis for their eat/don't eat decision.
- **Context** – comparing results for 'use by' and 'best before' pairings of yoghurt and cheese suggests that respondents' reliance on a particular date label ('use by' vs. 'best before') is itself influenced by the product on which the date appears, not merely the date in isolation. A similar proportion indicated that they would eat cheese labelled 'use by' 'any time after the date if it looked and smelt ok' as for cheese labelled 'best before'. For yoghurt, different results were seen with the proportion indicating that they would 'eat it up until the date on the label' being 10% points higher for the yoghurt labelled with a 'use by' than that labelled 'best before' (37% and 27% respectively). Further evidence for this was provided by the question that asked 'how do you decide whether to eat or throw away these products?' (no images were provided). A clear 'typology' of product emerged. Chicken and potatoes were at the extremes (heavily dependent on the date label and heavily dependent on judgement, respectively), bread and cheese treated similarly to one another, and yoghurt and milk treated similarly to one another.

When asked:

"Some retailers are thinking about removing date labels from fresh produce such as carrots, apples and potatoes. How comfortable or uncomfortable would you be buying fresh fruit and vegetables if they did not have a date label?"

the majority of respondents (60%) indicated that they would be either comfortable or very comfortable with a further 15% expressing no preference either way.

When asked what a series of 'use by' and 'best before' date label presentations meant, understanding was consistently better when shown simpler, clearer formats. Correct understanding was at 85% for a simple 'best

before' label and 76% for a simple 'use by' label. The inclusion of a 'display until' date caused understanding to fall to 70% and 69% respectively.

It is also important to note that the proportion giving the 'wrong' response was also less when the simple label was shown. Those linking the 'best before' date to safety was 14% with the simple date but 20% when combined with a 'display until'. Those linking the 'use by' date to quality was 25% with the simple date but 32% when combined with a 'display until'.

When 'use by' and 'best before' date labels were presented alongside alternatives, the word 'end' (as in 'best before end' or 'use by end') appeared less popular; though, when presented in isolation (in the image of a product) this unpopularity seemed to disappear.

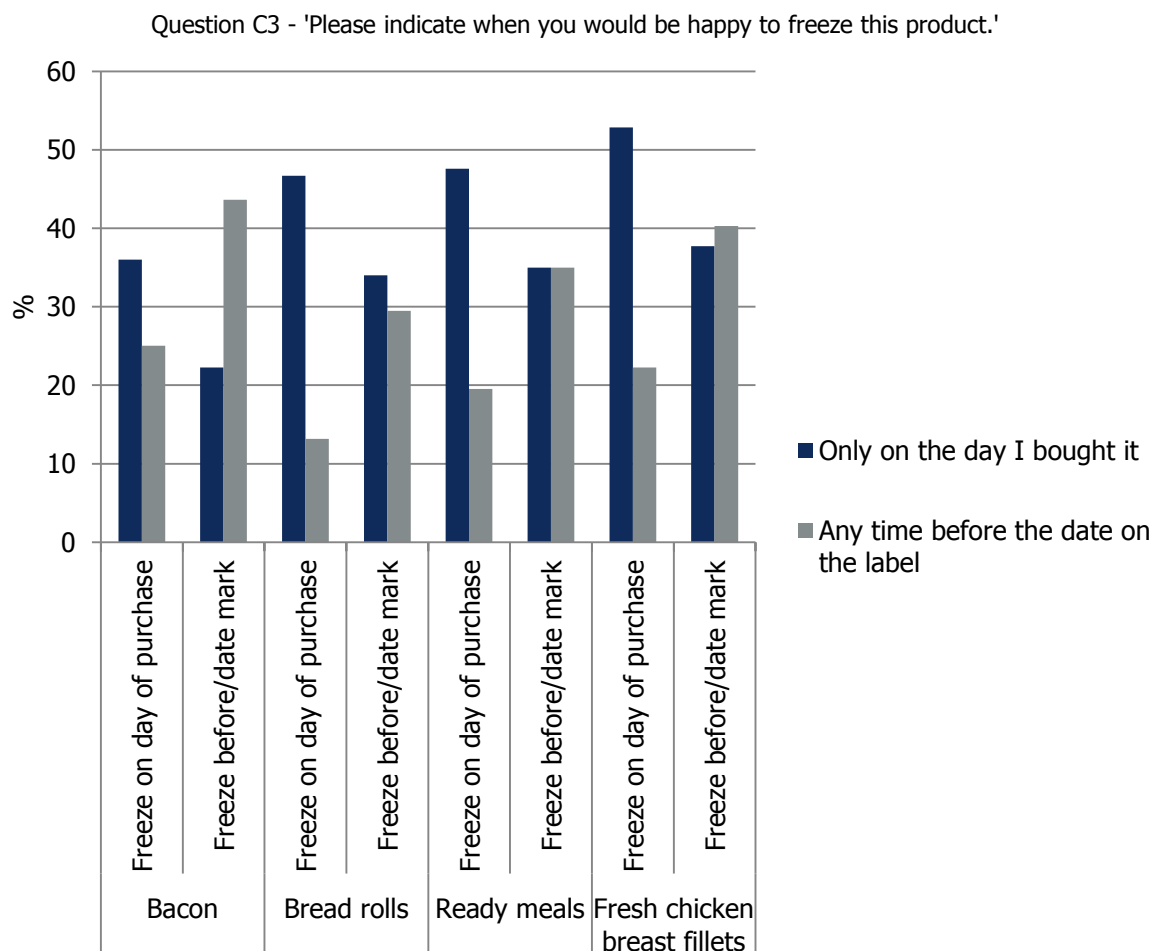
Similar irregularities could be seen with participants' response to which label they preferred. When asked about 'ease' of understanding, again the simple 'best before' and 'use by' date labels achieved the highest scores (94% and 95% respectively). But when asked in a separate part of the study about preference (not linked to understanding) the 'best before' with a 'display until' date achieved the highest score (38% for the combined date compared with 29% for the 'best before' on its own). The 'use by' date achieved a similar score both with and without a 'display until' date (24% and 25% respectively).

When presented with a series of products with variations in the 'Once opened, use within x days' guidance and asked which they would buy, respondents consistently, across a series of products, selected products with longer 'use within' periods.

A clear majority had seen the 'suitable for freezing' snowflake on its own and a large (though smaller) proportion had seen the logo with accompanying text. Younger people had higher recognition than older people. The overwhelming majority of respondents had a preference for the logo-with-text; and the presence of the text appeared to improve understanding; around 60% selecting the right answer when presented solely with the logo rising to 80% when the logo was presented with text. (The majority of respondents not selecting the right answer when presented with the logo plus text were selecting 'freeze on day of purchase', which shows that they do understand the logo but are also applying other guidance to its interpretation.)

Presented with four different products that compared different freezing guidance, the introduction of a 'freeze before / use by' date consistently caused a decline in the proportion selecting 'Freeze only on the day of purchase' and a sharp rise in the proportion choosing 'Any time before the date on the label'. The results are summarised in Figure 57.

Figure 57 Online survey responses testing 'freeze on day of purchase' and 'freeze before / use by' labelling



Asked to explain their general storage behaviour, 6 in 10 respondents selected 'I use my own judgement'. There was relatively little variation between different subsets of the population, though women were more likely to choose this option than men (64% vs. 56%).

The huge majority of respondents (>90%) indicated that they would find storage guidance or tips on-pack to be 'useful' or 'very useful'. Reasonable proportions (>half) also thought that 'On display boards in the supermarket' or 'On the supermarket shelf' would also be 'useful' or 'very useful', other options were less popular. There were few significant variations among different groups within the population. The inference is clear: consumers would like storage guidance to be as close as possible to the product, so that *if* they wish to use it as part of their decision-making, they can.

In broad terms, the results suggest that 'simpler' and 'clearer' date labels and storage guidance enables fuller understanding by consumers. The results would also support an inference that 'consistent', too, is preferable (though this could not be formally tested in this survey).

It is important to remember, however, that:

- Labels are not used in isolation but within a broader framework of 'judgement'.
- Labels are not used in isolation but in context – interpretation and (claimed) use of labels varies between different products and the distinctions between different types of date label vary by product too.
- The balance of judgement and context varies between groups within the population – older people have different 'defaults' than younger people and individuals with a higher tendency to look for date labels have different defaults from those who are less date label-aware.

These factors cloud the relationship between 'understanding' and 'use'. Thus, whilst labels that are clearer and/or simpler seem 'better' in that they are more likely to be more fully understood, this by no means ensures that actions taken in response to them will be 'better' as a result.

Indeed, large minorities consistently indicate actions (when they would eat something, when they would throw something away, when they would freeze something) that are likely to be highly linked to unnecessary food waste and which may improve only slightly with clearer and/or simpler labelling. This strongly suggests that background beliefs and habits are a key part of understanding label-related behaviour and that changes to labelling in and of itself is unlikely to bring about marked changes in food-related behaviour. A parallel 'behaviour change' programme which concerns itself with the details of the contextual settings within which labels and guidance are used would also be needed.

8.0 Conclusions and recommendations

8.1 Key insights: consumer understanding, interpretation and use of date labels

Numerous studies have tried to deduce understanding of different date labels through direct questions within a survey. However, the wording of the question response options can have a significant effect upon responses

- The key factor that seems to explain the largest swings is whether the question asks respondents for a 'technical' definition of the label or for their own personal 'working definition' of that label. For example, relatively high levels of correct responses around 'use by' dates - 55% (TNS, 2008) and 83% (Brook Lyndhurst 2008b) plummet to just 15% (WRAP 2010d) when respondents are asked directly about their behaviour or *what they would actually do*.
- In acknowledgement of these difficulties, understanding of date labels was tested in a variety of ways during this research.

Interpretation and use of date labels is best understood within the context of people's wider food practices (attitudes, values, habits, behaviours)

- The literature suggests that there is not necessarily a relationship between correct understanding and correct usage: any links that do exist are likely to be complex and informed by other factors.
- General food risk sensitivity is a key dimension in understanding the interpretation and use of date labels. This in turn is linked to people's confidence in their abilities and skills around food.
- Date labels are particularly valued for food where there is a perceived safety risk and are used most often for these products, both at home and in-store.
- The majority of consumers feel reasonably confident in their own understanding of date labels though some reported finding them overly complicated.

Consumers report using date labels in-store

- 75% of respondents claimed to use date labels in-store. The main motivations behind this reported behaviour were making sure that they bought the freshest and 'best' products and that they would have as long as possible to use food up.
- In this sense, it may be the case that the date label itself, rather than the information on it, is most important in building general consumer trust.
- During the accompanied shops, participants were observed to refer to dates relatively infrequently.
- Contextual factors, such as knowing that food would be eaten that day, the rate at which food is usually eaten, reduced the 'value for money' risk and, therefore, the need to look at the label.

Date labels are used principally at home, in disposal decisions

- Although 78% of participants claimed to 'keep an eye on dates' at home, they were mostly used simply to confirm a sensory judgement that the food is past its best. 30% of items in the kitchen diaries were thrown away because of being 'after the date on the label'.
- Dates were used much less frequently in on-going food management decisions. The largest differences in waste outcomes appeared to be explained by food planning and management behaviours – that is, behaviours that are 'upstream' of the disposal decision, when this research has shown that date labels are used much less commonly. This suggests that date labels have untapped value as a food management tool, upstream of the disposal decision.

Simpler date formats were best understood and preferred

- When asked what a series of 'use by' and 'best before' date label presentations meant, respondents were consistently more likely to choose the right answer when presented with simpler, clearer formats. Correct understanding was at 85% for a simple 'best before' label and 76% for a simple 'use by' label. The inclusion of a 'display until' date caused understanding to fall to 70% and 69% respectively.

Interpretation and use of date labels varies across people

- There is a spectrum of date label behaviours: with a minority ignoring them entirely, another minority at the other end of the scale relying on them heavily and the majority lying somewhere between the two.
- Younger people are more likely to view both 'best before' and 'use by' as indicators of food safety, and throw food out as a result.

Interpretation and use of date labels varies across products

- Date labels are relied on most for products with the highest perceived safety risk (and to a lesser extent quality risk e.g. bakery). Date labels are most important to consumers in the case of fresh meat, followed by dairy products. They are least important in the case of fresh fruit and vegetables.
- Analysis of responses highlighted the relative importance of the date label in disposal decisions for different product categories. Clear patterns emerged from the diary data; for example, in over 80% of disposal

decisions around yoghurts and eggs, the date label was rated as important, compared to just 11% of the fresh fruit that was thrown away.

- The overwhelming majority of respondents (60%) indicated that they would be either comfortable or very comfortable with removing all date labels from fresh fruit and vegetable packs, a further 15% expressed no preference either way.

Product type is often more important than label type ('use by' or 'best before')

- The combination of product type plus date (any date) is relied on to a greater extent in decision-making than the *type* of label ('use by' or 'best before') on the package.
- In the online survey, although chicken and cheddar cheese were both shown with a 'use by' label, there was a large difference in the proportion of people who said they would stick to that date – 51% for chicken and 21% for cheddar cheese.
- However, the type of date label present on the pack does have an effect on behaviour, albeit to a lesser extent than product type. Swapping the 'best before' for a 'use by' on yoghurt, for example, caused the proportion of people who said they would stick to the date label to rise ten percentage points, from 27% for yoghurt with 'best before' to 37% for yoghurt with 'use by'.

Date labels are most often used in conjunction with other factors: they are valued as one part of the decision-making tool kit, but most people combine them with other considerations to make decisions

- People rely on habits, experience and short-cuts around food. In some cases, the short-cut to making a decision is to rely on sensory judgement while, in others, the product type plus the date (any date) provides the most convenient basis for a decision. In other cases (for example, when the nature of the product or its packaging prevents a sensory judgement), the date label is the easiest and quickest way to make a judgement. It is less common for the *type* of date information present on the label to be factored into decision-making.

Despite considering date labels a useful guideline, many people expressed uncertainty about their accuracy and reliability

- As well as suspecting date labels of being a ploy to encourage extra purchasing, some people's trust in date labels was undermined by the observation that date labelling can be inconsistent across retailers.
- At home, most people assumed a 'margin of error' around the date on the label within which they could use their own judgement. These margins were usually based on personal, product-specific rules of thumb.
- A small minority of the most risk averse, date-label-dependent participants claimed to prefer to leave a buffer of one day *before* the date on the label, just to be on the safe side of any perceived quality or safety risk. It was more common, however, for participants to report leaving margins *after* the date on the label, within which they would be happy to eat the product.
- In the purchasing context, date labels play a generic trust building role – the presence of date labels may be more important in building consumer trust than the actual date type / date. Some participants commented that date labels were an effective accountability mechanism that prevented supermarkets putting 'old' food on the shelves.

Interpretation and use of date labels is contextual and dynamic

- Except at the extreme ends of the behaviour spectrum, use of date labels is dynamic and contextual, influenced by factors such as the type of food being prepared, who is going to eat it (risk sensitivity is amplified around children and the elderly), the availability of alternatives to food that is past its best and even the mood of the decision maker at the moment of the eat/dispose decision.

The link between understanding and behaviour is complex and non-linear, with interpretation informed more by practical application than technical understanding

- 'Understanding' of date labels is firmly embedded in people's practical application of them. The ability to identify the technically correct answer from a list has little connection to how the information is used in real life.

8.2 Key insights: consumer understanding and use of storage guidance

Reported use of storage guidance is very high

- More than 80% of participants claimed to follow storage guidance the majority of the time, although this figure is not consistent with the qualitative research element. Most interviewees did not seem to use it very often and storage *guidance* did not seem to play a prominent role in most people's actual storage *choices*.
- There is evidence that shelf-life expectations are influenced by food storage behaviour - those who, after opening the products, store cheese and fresh meat in new wrapping in the fridge are more likely to think that these last longer than those who store them in the original packaging.

Storage habits are based on general rules of thumb that are informed by a range of factors, one of which is on-pack storage guidance

- Personal idiosyncrasies and learnt behaviours are often combined with on-pack storage guidance into personal rules of thumb. The importance of on-pack guidance varies across people, often in proportion to their general risk sensitivity.
- The force of habit appears to be a key influence on consumers' food storage behaviour and there was evidence that social norms may drive some food storage behaviours – in particular the social norm of having a fruit bowl, as a 'reminder' to eat fruit.
- The cluster analysis revealed that the storage guidance behaviours are most strongly related to food management behaviours. Those who pay the most attention to storage guidance not only appear more likely to use up food past its best, they also seem more likely to monitor their stock and plan their shopping trips and to be less worried about food safety.

Different types of storage guidance have different value for consumers

- Guidelines about *where* to store food (with the exception of freezer guidance) were often seen as superfluous to requirements by consumers, most of whom felt confident about where food should be kept (e.g. if it needed to be refrigerated).
- Of guidance about where to store products, specific instructions (e.g. in the fridge, in a cupboard) were preferred over generic instructions e.g. 'Store in a cool dry place'. The online survey showed that with regards freezing guidance, there was a preference for the instructions to be as clear and explicit as possible (e.g. the snowflake logo with text to indicate suitable for home-freezing).
- 'Use within' guidance was valued more, and interpretation and use often reflected a person's risk sensitivity: the most risk averse strictly adhered to this type of advice, with the vast majority using it as a rough guideline.
- Freezing guidance was sought out relatively frequently by participants, perhaps due to widespread uncertainty about the types of foods that can be frozen and for how long.

Most consumers do not check storage guidance on every occasion, but are more likely to generalise guidelines into rules of thumb

- The tendency to generalise 'rules' has turned the 'Freeze on day of purchase' guideline found on some foods into widespread reluctance to freeze any food after the day of purchase.
- Similarly, 'use within x days' guidance was often generalised by participants into a 'rule of thumb', leading some people at the most risk sensitive end of the spectrum to apply very short timescales to food they had opened.
- Qualitative research gives the impression that inconsistencies or exceptions to general storage rules (e.g. most, but not all, fruits should be kept in the fridge) can undermine consumers' faith in 'top level' guidance.
- That consumers tend to refer to storage guidance most for unfamiliar products suggests it could have an important role to play in building brand loyalty.

The majority of consumers said they would be more likely to purchase products with longer 'use within' periods

- This links to the value that consumers place on having as long as possible to use food up after they have bought it – shelf-life calculations were a common feature of purchasing decisions.

Participants were quick to understand alternatives to 'freeze on day of purchase' labelling

- Presented with four different products that compared different freezing guidance, the introduction of a 'freeze before / use by' date consistently caused a decline in the proportion selecting 'Freeze only on the day of purchase' and a sharp rise in the proportion choosing 'Any time before the date on the label'.
- Product type is a factor in how freezing guidance is interpreted, for example, people are more likely to stick to 'Freeze on day of purchase' advice on bread and more likely to ignore it on bacon, due to perceptions/experience about the speed at which the quality of these two products deteriorates.

There is uncertainty about whether storage guidance relates to product quality or safety

- Uncertainty about whether 'use within' is a quality or safety guideline led some risk averse participants to err on the side of caution and throw food away unnecessarily.
- Uncertainty about whether particular foods are suitable for freezing – again, relating to people being unsure about food safety implications – meant that in some cases, food that could have had its shelf-life prolonged through freezing may have gone to waste.
- Uncertainty about the appropriate length of time food can be kept in the freezer caused a general lack of confidence among some participants and caused some frozen foods to be thrown away unnecessarily.
- A small minority of participants adhered to food dates, despite a product having been frozen at home within date.

8.3 Implications for household food waste

WRAP's kitchen diary research (2008b) found that approximately 20% of food waste (by weight) was described as being 'out of date' and the current research shows that 'It was past the date on the label' was cited as an important reason behind 30% of disposal decisions. However, this research has demonstrated that the date label is rarely a stand-alone factor in disposal decisions, but is most often used in combination with other considerations. As discussed, decisions are often based on a combination of the date label and sensory judgement, and interpretation of the date label is influenced by a number of contextual factors, as well as the type of product in question.

Date labels and storage guidance have the potential to contribute directly to food waste – for example, misinterpretation of a 'best before' date as a strict cut-off date and adherence to 'freeze on day or purchase' guidelines may lead to food being thrown away unnecessarily.

Date labels and storage guidance also have the potential to contribute indirectly to food waste through influencing food management behaviours 'upstream' of the disposal decision. In the case of food being thrown away because it is past its 'use by' date, it is inaccurate to say that the date label is the cause of the waste, when in fact the waste is due to a failure to use up or freeze food before the date passes. In this case, a failure to utilise date labels effectively in food management may have contributed to the final waste outcome, but this effect is very difficult to quantify.

Identifying the causal role of consumer understanding and use of date labels and storage guidance in food waste is further complicated by the non-linear relationship between understanding and behaviour. This research has shown that there is often a disconnect between the 'technical' understanding of a label and how that label is interpreted in practical terms. This practical 'understanding' is driven by a number of behavioural and attitudinal factors, such as wider food risk sensitivity, as well as being heavily dependent on product type and contextual and circumstantial factors.

Despite these complexities, this research has highlighted some important patterns. The following sub-sections provide more detail on the direct and indirect implications of date labels and storage guidance for household food waste.

8.3.1 Date labels

The direct effects of misinterpretation of 'best before' dates in food waste

The clearest and most direct link between interpretation/use of date labels and food waste is at the most risk averse end of the spectrum, among those consumers who see a date – any date – and interpret it as an indication that food should be thrown away. The investigation of the extent of consumer (mis)understanding of the meaning of different types of date label has revealed some important patterns with regard to this.

The results of the online survey show that 14% of consumers interpreted a 'best before' date as an indicator of food safety. This is a similar proportion to the number of kitchen diarists that were interviewed who took a strict, blanket approach to date labels, using all dates as strict cut off points: in each location, one or two out of twelve interviewees took this approach. It also echoes the 16% of survey respondents who stated that they would eat cheddar cheese with a 'best before' date only up until the date on the label and the 17% who said the same about bread.

The online survey provides clues as to which consumer segments are most likely to exhibit this behaviour. The most significant pattern is that younger age groups are most likely to view both 'best before' and 'use by' labels as strict safety guidelines – 18% of 18-24 year olds and 21% of 35-44 year olds answered that 'best before' was a safety indicator, compared to 9% of the 65+ age group.

The online survey shows a correlation between high levels of date label use and a tendency to take a strict safety approach to all labels. This suggests that date label information is valued and used most by the most risk sensitive consumers; at the same time, it is these people who are most likely to misinterpret and mis-use date labels. At the other end of the spectrum, it seems that those who use date labels the least are those who are most likely to interpret both 'use by' and 'best before' dates as quality guidelines. The depth interviews suggested a correlation between this behaviour type and a much more relaxed attitude to food risk. This in turn was often related to an individual's confidence in their knowledge and skills around food (for example, in terms of turning

leftovers into new meals). In other words, there was less demand for date information among those who were more relaxed about food risk and those who were more confident in their own food skills.

This research suggests that date label behaviours may be understood as a spectrum, with minorities at each end of the spectrum who take a 'blanket approach' to date labels. Members of the minority group at the risk averse end of the spectrum throw away food on the date on the label, regardless of label type, product type, or any of the other drivers of date label behaviours that apply in the majority of cases. In this case, misinterpretation of date labels is a clear and direct cause of food waste. Overall, therefore, we can estimate that misinterpretation and mis-use of the 'best before' date has a systematic, direct effect on food waste outcomes for around one in six consumers, rising to one in five among younger age groups.

Indirect effects: a failure to utilise date labels 'upstream' of disposal decisions

Particular patterns in date label behaviour were found to be related to wider food attitudes and behaviours, some of which are more important in explaining food waste outcomes. For example, attitude to risk, food planning and habits and willingness/ability to use up leftovers and food past its best were all found to be related to patterns of interpretation and use of date labels. Table 24, derived from the cluster analysis in section 3 and the diary data in section 4, shows the relative waste implications of these different attitude/behaviour themes.

Table 24 Average number of food items thrown away over a two week period, analysed according to different behaviour/attitude themes³¹

Attitude/behaviour theme ³²	Cluster name % questionnaire respondents (n=168)	Average food items thrown away
1 - Reported date label behaviours	Date driven (39%)	14.3
	Date savvy (49%)	12.0
	Date disengaged (13%)	11.6
2 - Reported storage guidance behaviours	Storage guidance agnostic (48%)	13.6
	Storage guidance aware (52%)	11.7
3 - Attitudes to food risk	Confident judges (42%)	11.4
	Safety sensitive (58%)	13.9
4 - Food management behaviours	Leftover leavers (34%)	15.3
	Fridge foragers (67%)	11.6
5 - Shopping and stock management behaviours	Cupboard monitors / list makers (65%)	11.3
	Spontaneous shoppers (35%)	15.5

Table 24 shows that respondents classified as 'Date disengaged' threw away an average of 11.6 items during the course of the diary exercise, compared to 14.3 items for those classified as 'Date driven'. Looking across the groups, those who are less engaged with dates, those who rely more upon their own judgment, those with greater food management skills and those with better stock management techniques threw away fewer items, on average, than their opposites.

The differences between the clusters are most pronounced for the food management and stock management behaviours: spontaneous shoppers, for example, threw away a third more food than 'cupboard monitors / list makers' and 'leftover leavers' threw away a third more food than 'fridge foragers'³³. This highlights that the

³¹ These figures are **indicative only and a number of caveats apply**: (a) the sample was not nationally representative, so the size of the clusters is shaped by the characteristics of the food diarists (b) the average number of food items thrown away is only a very rough proxy for volume of food waste – the quantity of food thrown away on each occasion is not factored in (c) background characteristics of respondents, such as household size, are not factored in to this analysis either. Despite these caveats, however, this analysis gives a rough idea of the overall patterns.

³² Note that the entire sample was clustered for each theme – the themes are not mutually exclusive and each theme overlaps with all the others.

³³ These clusters are, as explained in section 3, preliminary and warrant further analysis, but it is noteworthy that if the fridge forager/leftover leavers dichotomy applies to the population generally, and if they are present in the population as they were in

largest differences in waste outcomes appear to be explained by food planning and management behaviours – that is, behaviours that are ‘upstream’ of the disposal decision, when this research has shown that date labels are used much less commonly.

This suggests that there is unfulfilled potential for date labels to play a more significant role in food management behaviours: date labels are currently used principally at the end of a product’s shelf-life, by which time it is often ‘too late’. However, they have untapped value as a food management tool, upstream of the disposal decision. Improved use of date labels in upstream food management behaviours could have an important, indirect effect on reducing food waste.

Product categories which might benefit most from changes to date labels and to how they are used

As all the evidence has shown, product type is central to people’s interpretation of date labels. The kitchen diaries reveal patterns in when different types of food were thrown away, relative to the date on their label:

Products carrying a ‘best before’ date

As shown above, misinterpretation of ‘best before’ labels as strict cut off points has direct consequences for food waste. The kitchen diary data show that 5% of items carrying a ‘best before’ date were thrown away on the date on the label, and 12% were thrown away the day after the date on the label. Using the kitchen diary data, the types of products that were thrown away during the period immediately around the ‘best before’ date were explored.

Misinterpretation/mis-use of ‘best before’ dates as a food safety date:

- Items thrown away on the ‘best before’ date comprised bread and pastries (44%) and fresh vegetables (22%).
- Items thrown away one day after the ‘best before’ date again comprised bread and pastries (48%) and fresh vegetables (12%).

Although these results do not reveal the relative importance of the ‘best before’ date in these decisions compared to other reasons for disposal, it is interesting to note that 17% of disposed items carrying a ‘best before’ date were thrown away either on the day of the ‘best before’ or the day after. Furthermore, the vast majority of food thrown away around the ‘best before’ date was bread and pastries, followed by fresh vegetables.

The kitchen diaries and depth interviews provide some insight into the case of bread, which was the second largest product category to be recorded in the kitchen diary, accounting for 16% of the total food thrown away over the two weeks. The comments made in the kitchen diaries about bread entries were predominantly about the bread being “stale”, “dry”, “hard”, “not fresh” and so on. The depth interviews confirmed that many people disposed of bread because they were not prepared to eat or use up bread that was past its best. The diaries and depth interviews also showed that most people have low expectations regarding the shelf-life of bread and often bought fresh loaves on a regular basis, regardless of whether they already had bread at home.

This quality sensitivity around bread may be linked to an expectation of ‘daily bread’ and its relatively low price perhaps makes it possible and even acceptable in the minds of some consumers to replace bread regularly. The frequency with which bread was thrown away may also indicate poor storage, which in turn may feed into consumers’ expectations that bread does not last or stay fresh very long. Finally, only rarely did participants report using up stale bread in recipes such as stuffing or bread and butter pudding: it may be the case that many people do not have the time, inclination or skills to do this.

Products carrying a ‘use by’ date

Products carrying a ‘use by’ date should not be eaten after the date on the label, as they may not be safe. Uneaten food, therefore, should be thrown away if it has passed its ‘use by’ date. This is, however, indicative of poor food management, since the food could have been used or frozen before it reached its date. Previous research has also shown that many consumers do not realise that, if it has been stored correctly, food can be used (eaten or frozen) up until midnight on the date on the label – food thrown away on the actual day of the ‘use by’ date may therefore indicate a misinterpretation of the label. Of disposed products carrying a ‘use by’ date, 11% were thrown away on the date on the label, 19% were thrown away the day after the date on the label and 13% were thrown out two days after the date on the label.

our kitchen diary sample, then food waste nationally would be reduced by 10% if ‘leftover leavers’ could be persuaded to behave the same way as ‘fridge foragers’.

The diary data reveal the following themes:

Possible misinterpretation of the 'use by' date: throwing food away on the day on the label

- Items thrown away on the 'use by' date fell largely into four product categories: dairy (26%), salads (16%), cooked, cured, sliced meat/fish (16%) and bread and pastries (12%).

Poor food management – food that has passed its 'use by' date

- One day after the 'use by' date, a variety of foods are thrown away – the largest categories were dairy (35%), salads (22%), fresh vegetables (18%) and cooked, cured and sliced meat/fish (11%).
- Two to four days after, date differences across product categories diminish, led by dairy and followed by salads, cooked, cured, sliced meat/fish, fresh vegetables and yoghurts being thrown away in roughly equal measure.

Possible poor storage, indicated by food being thrown away before the 'use by' date

- Items thrown away 2-4 days before the 'use by' date included dairy (32%), salads (22%) and cooked, cured and sliced meat/fish (14%).

It is interesting to note the prominence of dairy in these results, since they were often singled out by research participants as products that they would not eat after the date on the label – for example, around four in ten online survey respondents said they would not use milk after the date on the label (which is the correct response as milk carries a 'use by'). In contrast, the majority of people said they would rely more on their own judgement in the case of salads and fresh vegetables. This suggests that the date label is more prominent in disposal decisions around dairy products, whereas for fresh vegetables and salads, sensory judgement is more important. In any case, in all of these examples, regardless of the prominence of the date in the decision, the true cause of food waste is a failure to use up the food before it passed its date.

Products carrying a 'display until' date

The other research components suggested that some consumers may interpret 'display until' dates as an indicator of food quality or safety, and throw food away on that date.

- 26 diary entries (i.e. approximately 1%) showed food being thrown away on the day of the 'display until' date. The main product categories were fresh vegetables, salads, bread and pastries, cooked/cured/sliced meat/fish and dairy products. These entries could indicate misinterpretation of the 'display until' date, or suggest that the food had been stored poorly and had gone off early. A possible point of interest is the fact that bread and pastries are the largest category thrown away one day after the 'display until' date (33%).

The depth interviews revealed that most people understood the 'display until' date as a label for store-staff/stock control, and this was confirmed by the online survey, where over 90% of respondents correctly identified it as such. However, 7% of respondents thought the 'display until' date was a quality indicator, which suggests that in a small number of cases, the 'display until' date may be having a direct influence on food being thrown away unnecessarily. Since the survey also revealed that the presence of a 'display until' date has a negative impact on consumer understanding of both 'use by' and 'best before' dates, the 'display until' date may also be having a secondary impact on unnecessary food waste.

8.3.2 Storage guidance

Although storage guidance is used, overall, to a lesser extent than date labels by the majority of people, the way in which it is used has both direct and indirect implications for food waste.

'Once opened, use within X days' guidance

Adherence to 'Use within x days' guidance is largely a function of an individual's risk sensitivity, both in general and with regard to specific products. It is often correlated with an individual's approach to date labels – those who are most risk sensitive are most likely to seek out - and be particularly conservative around - both date labels and 'use within' guidance. This suggests that roughly somewhere between 10% and 20% of consumers may rely on the 'use within' guidance (or a rule of thumb incorporating that guidance) over their own sensory judgement. However, it should be noted that almost all consumers stated a preference for products with longer 'use within' periods (in the online survey), since they have longer to use them up.

- Among those consumers who are highly risk averse (between 10% and 20%), strict adherence to short 'use within' periods may lead to some food being thrown away unnecessarily.
- Uncertainty around whether this type of guidance is about safety or quality leads the most risk averse consumers to 'play it safe', again potentially contributing to avoidable food waste.
- Generalisation of 'use within' guidance may be a factor in general conservatism among some groups around using up food that has been open.

Freezing guidelines

Certain aspects of current freezing guidelines also potentially contribute to household food waste.

- Due to the tendency to incorporate guidance into general rules of thumb, the 'Freeze on day of purchase' guidance present on many products has resulted in the widespread practice of freezing food only on the day it is bought. Alternative freezing advice is exceedingly rare, which may explain the dominance of this particular guideline in people's freezing habits.
- Even among those groups who are less risk averse, the possibility of freezing food that is approaching the end of its shelf-life does not seem to occur to most people. This suggests that there are missed opportunities among all groups to prolong the shelf-life of foods through freezing. As the online survey showed, the impact of introducing 'freeze before / use by' or a 'freeze before / best before' date label was considerable.
- The majority of people rely on their own judgement and experience to decide what can and cannot be frozen. However, one risk averse participant stated that she would not freeze anything unless it had the snowflake logo, due to safety concerns about unwittingly re-freezing a product. In general, therefore, it may be the case that uncertainty may lead to hesitation, especially among the most risk averse consumers, to freeze products that do not explicitly carry freezing advice. This again may mean lost opportunities to prolong the life of food through freezing it.
- Uncertainty about how long food can be kept in the freezer may lead to some frozen foods being thrown away unnecessarily and, in general, undermines confidence about using the freezer.

The impact of inconsistent storage information within product categories

A final question relating to the waste implications of storage guidance is the impact of inconsistently presented storage information – as storage guidance is not standardised, it often differs across brands and product variants. It is likely that the version any given participant would choose to pay attention to and incorporate into their personal systems is a reflection of their general food approach – for example, the most risk sensitive participants are likely to adopt the most conservative versions of, for example, 'use within' guidance into their storage habits.

The impact of differences and inconsistencies is likely to differ across products and across different types of guidance. For example, it is unlikely that most participants notice differences in where/how storage guidance for regular purchases, since these storage behaviours are highly habitual and little influenced by on-pack guidance. On the other hand, it is possible that differences in 'use within' periods on variants of the same product, if noticed, might undermine confidence in the reliability of these guidelines. This may be particularly the case among the most cautious consumers who look at labels most closely – and it is among these consumers where uncertainty leads to food being thrown away unnecessarily due to people 'playing it safe'.

8.3.3 Summary

The kitchen diaries showed that 68% of the items thrown away over the two week period were in their original packaging (the remainder being bought loose, was 'leftovers' or had been removed from its packaging). This implies that, in approximately two thirds of the disposal decisions made, there was the opportunity to refer to date labels and/or storage guidance.

This research has revealed that date labels and storage guidance can have both direct and indirect effects on household food waste: misinterpretation and mis-use of labels may cause food to be thrown away unnecessarily and a failure to utilise them effectively can play a part in poor food management that results in food waste.

The diary data show that the largest product categories thrown away over the two weeks were fresh vegetables (20%) and bread/pastries (16%). These are both product categories that the majority of research participants said they would be happy to eat after the date on the label. The findings of the depth interviews suggest that this is because most people are confident in their own ability to tell if these products are good to eat, and operate in accordance with strongly ingrained, habitual rules of thumb, especially around bread. When pieced together, the evidence suggests that the date label is not the most important driver of wasted bread and vegetables for the majority of people.

In contrast, dairy products, which were the fourth largest category of food recorded in the kitchen waste diaries (representing 7% of entries), were often identified by participants as products for which they paid special attention to the date label - for example, four in ten respondents to the online survey said they would not use milk after the date on the label. The two product categories for which date labels were cited most often as an important reason for disposal – yoghurt and eggs – were together responsible for 5% of the kitchen diary entries. Yoghurts may carry either a 'use by' or 'best before' date and eggs carry a 'best before', although consumers are advised to treat it as a 'use by' date. Both of these products were identified by some consumers as being difficult to judge themselves and were perceived as relatively high risk. Added to this, inconsistencies in terms of labelling

may, if noticed, cause uncertainty and the evidence has shown that uncertainty and confusion often result in consumers 'defaulting' to a safety interpretation of the date label.

Overall, the results of the research suggest that the role played by date labels and storage guidance in household food waste is complex and multi-faceted. Date labels are clearly and linearly linked to food waste in only a small number of cases, but they are implicated, in combination with other drivers, in a significant proportion of food waste. In addition to this, a *failure* to use date labels and storage guidance as food management tools represents a missed opportunity for many people to prevent waste through 'upstream' action.

8.4 Recommendations

8.4.1 *What impact could changes to labelling have on household food waste?*

All consumer research into use of labels must be situated in the wider context of how food labelling is used in general. Food labels are used by most people in the majority of situations as quick short cuts, heuristics or rules of thumb. Most label information is not 'centrally processed' by consumers, but rather is used as a 'beacon' to aid decision-making (FSA, 2010). Related to this, it is well established that consumers use labelling on a 'need' basis – only after having identified a need for the information will the label be noticed or sought out.

Furthermore, even where a need exists, if the time costs of seeking and understanding that information are too high, then the label is unlikely to be used. If the costs outweigh the perceived benefits, the label is of little value to the consumer and alternative decision-making tools and short cuts will be used. People will seek to minimise the costs of their decision-making through any available short cut (hence the importance of experience/habit in consumer food decision-making). Where a label represents a reliable short cut, it will be used, but if an alternative short cut exists (for example, a quick sensory check) this is most likely to be relied upon.

Within this wider context of use of food labelling in general, this research has painted a picture of further complexity in terms of the behavioural and attitudinal drivers behind consumers' use of date labels. Firstly, interpretation and use of date labels is partly a function of wider elements of an individual's food 'practices' – their habits, values, attitudes and behaviours. For example, an individual's sensitivity to food risk – which may itself be a function of a wider attitude to risk that extends beyond just food – was found to be a central determinant of that individual's approach to using date labels. The cluster analysis of the baseline questionnaire data also showed links between date label behaviours and other behaviour sets – for example, those who are most engaged with date labels are more likely to plan their shopping and those who are least engaged with date labels are more willing to use up food that is past its best. (It should be acknowledged that the research has not been able to establish the precise causality associated with these clusters: whether being more engaged with date labels *leads* to being more likely to plan shopping, or vice versa. What is clear, however, is the tendency of these behaviour patterns to go together.)

This research has shown that 'understanding' of date labels is firmly embedded in their practical application – the way date labels are interpreted by any given individual is a function of their wider food practices, is highly dependent on product type and can change according to circumstance and mood. A technical understanding of the meaning of different date label types is rarely an important factor in how date labels are interpreted and used. In fact, the ability to correctly identify the definition of different date labels is reasonably high; yet the majority of people do not use date labels in accordance with their technical definitions. In the case of both date labels and storage guidance, it seems that behaviour is a greater influence on understanding, rather than the other way round.

With these insights in mind, this research has highlighted the need for action from two separate angles:

- Firstly, there is a variety of ways in which date and storage information could be made more accessible, meaningful and valuable to consumers.
- Secondly, there are complementary changes required from a consumer behaviour point of view that would optimise the effects of these improvements to information provision.

The section below sets out these recommendations for improving consumer understanding and application of date labels and storage guidance.

8.4.2 Recommendations for changes to labelling

Continue to clarify the meaning of 'best before' and 'use by'

- Despite difficulties in assessing the level of understanding and 'correct' use of date labels (because results may be influenced by whether the question is prompted or unprompted, the wording of the answer options etc.) for both the food safety and waste agenda, improving understanding is important.
- The results suggest that 'use by' is understood least, and (worryingly) more likely to be inaccurately interpreted by older people. Although a small minority of the most risk averse, date-label-dependent participants claimed to prefer to leave a buffer of one day *before* the date on the label, just to be on the safe side, it was more common for participants to report leaving margins *after* the date on the label, within which they would be happy to eat the product. This again varied with the general risk sensitivity of the participant, as well as with product type.
- It would be most effective to communicate to consumers about date labels via carefully chosen products, given consumer propensity to generalise 'rules' and adopt advice into rules of thumb. Previous research supports this recommendation; people respond most positively to advice which is tailored to specific products and when the benefits were explained (Brook Lyndhurst, 2008b).
- Misinterpretation of 'best before' appears to be a significant factor in the disposal of bakery and fresh vegetables in particular.

Remove 'display until' dates

Despite some consumers claiming to find the 'display until' date a useful piece of extra information, earlier research (WRAP, 2010b) has shown that stock control is apparently working well for many products/retailers without relying on 'display until' dates, and this research has shown that 'display until' dates potentially lead to household food waste in a number of ways:

- The presence of a 'display until' date reduced understanding of both 'best before' and 'use by' dates – the proportion of people interpreting 'use by' as a quality mark rose from 25% to 32% when a 'display until' date was present and the proportion interpreting 'best before' as a safety date increased from 14% to 20% when a 'display until' date was present.
- The simpler date formats (i.e. just a 'best before' or 'use by' date) were found easier to understand than those combining these dates with a 'display until' date.
- The qualitative element of the research found that many people do not pay attention to the type of date on the label and the 'display until' date is used, in a small number of cases, as a strict cut-off date, or at least as an indicator of optimal quality.
- The presence of an earlier date may bias consumers' expectations of how long the food will last, potentially leading to food being thrown away unnecessarily early.
- Linked to this was demand for simplification of the labelling system: many participants reported that they found date labels over-complicated and that the effort required to understand the detail outweighed the perceived potential benefits.

Aim for consistent date type use within product categories, where appropriate

- Yoghurt and cheddar cheese are two examples of products that may carry either a 'best before' or a 'use by' date. This 'inconsistency' may increase uncertainty among those who do pay close attention to labels, who are typically the most risk averse consumers.
- Although interpretation and use of date labels is driven principally by product type, the online survey revealed that the type of date label present on the pack does have an effect on behaviour, albeit to a lesser extent than product type. Swapping the 'best before' for a 'use by' on yoghurt caused the proportion of people who said they would stick to the date label to rise ten percentage points, from 27% for yoghurt with 'best before' to 37% for yoghurt with 'use by'.
- The higher the perceived risk associated with a product, the less difference label type makes, since consumers are prone to simply default to a strict safety interpretation. The same change made just a 5% point difference for cheddar cheese (which is perceived to be lower risk, perhaps because of the more obvious signs of deterioration).

Investigate label redesign to make date labels easier to interpret

- The online survey showed that understanding of date labels fell slightly when the disguised stock control date [(2)] was incorporated, and consumers found it a less useful label. For example, for 'best before' understanding reduced from 85% for the simple date to 77% for the label incorporating the disguised stock control date. However, this was still higher than for the 'best before' / 'display until' combination (71%). 'Ease' of understanding also fell from 94% to 83%. A similar, but less pronounced trend, was noted for 'use by'.
- Putting this information near to the consumer-facing date is likely to increase uncertainty and confusion and this research has shown that the higher the uncertainty, the more people are likely to 'default' to a strict safety interpretation of the date on the label. Where 'disguised' stock control dates are used, consider how they might be better disguised or located.

- Eye tracking research (FSA 2010) has shown that consumers spend very little, if any, time looking at date labels, both in-store and in the home. For a date label to effectively convey information, it must be simple and instantaneous – most consumers are unlikely to invest the time and effort to understand a complicated label or to read the small print. Date labels have thus far been applied as functional, legal requirements and most date labels have not been designed with consumer engagement in mind.

Enhance existing storage guidance

- As part of a general process of improving in-home food management practices, providing tips and guidance on general storage behaviour may progressively feed through into the 'rules of thumb' that consumers typically rely on.
- The huge majority of respondents (>90%) indicated that they would find storage guidance or tips on-pack to be '*useful*' or '*very useful*'. Reasonable proportions (>half) also thought that 'On display boards in the supermarket' or 'On the supermarket shelf' would also be '*useful*' or '*very useful*'. The inference is clear: consumers would like storage guidance to be as close as possible to the product, so that *if* they wish to use it as part of their decision-making, they can.
- The existence of mixed messages (for example, fruit and eggs stored at ambient temperature in-store, but with on-pack advice to refrigerate) is also identified as a source of uncertainty for some consumers (Defra, 2009).
- Improving correct in-home storage (e.g. correct domestic fridge temperatures) would give manufacturers confidence to increase shelf-life.

Lengthen 'once opened, use within x days' guidance, where possible

- Consumers' tendency to generalise advice as an alternative to checking the pack every time has led some more risk averse participants to be highly conservative about the amount of time they are happy to leave food open. Lengthening 'use within' periods, in cases where safety is not an issue, may lead to a lengthening of expectations around the shelf-life of opened foods.
- The majority of respondents for all the products shown, selected that they would prefer to buy the product with the longer date. For ham the increase was around 50% points preferring the longer date, for milk around 45% points and for ambient cooking sauce around 30% points.

Include the snowflake logo with explanatory text on suitable products

- The introduction of accompanying text had a clear impact, with a higher proportion indicating that it means "This product can be frozen" (an increase from 62% to 81%) and the near complete elimination of erroneous and uncertain responses ("This product must be frozen", "This is a frozen meal" etc.).
- 89% of respondents considered it 'most useful' compared to just 1% claiming the same for the logo on its own.

Move to alternatives to 'Freeze on day of purchase' guidance, where possible

- Again, consumer propensity to generalise and adopt 'rules of thumb' has led to widespread reluctance to freeze food once it has been stored in the fridge or cupboard at home, with previous WRAP research (2010f) finding that 59% of respondents only freeze food on the day they buy them.
- The online survey suggested that 'freeze before / use by' labels were an effective counter to this, particularly for products about which there is less risk sensitivity. For example, for bacon, the proportion indicating that they would freeze it 'any time before the date on the label' increased from 25% to 44% when the 'freeze before / use by' label was shown. For bread rolls the proportions increased from 13% to 29%. This indicates that many consumers will make use of the flexibility alternative labelling gives them, though the large proportion of those buying food specifically to freeze it at home will continue to freeze it as soon as they get home.
- It is important to couple any 'freeze before / use by' label with appropriate 'use within x months' of freezing and defrosting guidance e.g. 'defrost and use within 24 hours'.

Fruit and vegetable waste is the largest proportion of all household food waste. Some retailers have expressed interest in whether removing date labels from fresh fruit and vegetables³⁴ would be a positive move to reduce waste. This is discussed below:

The literature review revealed that date labels are less important for bakery products, cereals, and fresh fruit and vegetables (FSA, 2009c; Brook Lyndhurst, 2008a) though, other work found that 63% of respondents claimed to always read date labels when buying fresh fruit and vegetables (WRAP 2008a). Fruit, vegetables, bread and cooked/cured meats (including bacon) were all examples of products that some participants assessed using touch and sight (rather than / in addition to the date label) and the 'date label' was rated as 'important' in just 11% of fruit disposal decisions reported in the kitchen diary. Low reliance on date labels may be due to the fact that people are more accustomed to buying fruit and vegetables loose, with no date label.

³⁴ *Uncut fresh fruit and vegetables are not required by law to carry a date mark.*

When asked in the online survey, the majority of respondents (60%) indicated that they would be either 'comfortable' or 'very comfortable' with removing date labels from fruit and vegetables, with a further 15% expressing no preference either way. Almost 50%, in the online survey, said they would eat potatoes any time after the date on the label if they looked and smelt ok and 70% said they 'mostly' or 'entirely' use their own judgement in deciding whether or not to eat or throw potatoes away.

However, the main motivation behind using date labels in-store is to select the 'freshest' and 'best' product and 'freshness' is key to buying fruit and vegetables. The current approach taken by retailers for pre-packed, uncut fruit and vegetables is varied (WRAP 2010b), with some products only carrying a 'display until' date, some both 'display until' and 'best before' and a minority 'best before' only.

In the short-term, the food industry is encouraged to simplify the approach to labelling fruit and vegetables in line with the main recommendations from this study. They are also encouraged to extend shelf-life where possible (particularly in line with seasonality), and reinforce optimum storage guidance and the meaning of the date labels. It is suggested that further in-store trials are conducted to determine the optimum approach to date labelling for fresh fruit and vegetables, and any impact on wastage at home. WRAP would welcome discussions with, and evidence from, the sector to develop more robust recommendations.

8.4.3 Changes to consumer behaviour

The research has outlined the complex setting within which date labels and guidance information is used by consumers. We have concluded that changes to date labels and/or storage guidance that have the potential to produce positive impacts in terms of food waste may not fulfil that potential unless they are accompanied by simultaneous actions that address the complexity of the setting in which those labels are used.

Devising suitable actions requires us to draw on three levels of insight:

- Insight derived from the generality of research, thinking and policy development in the field of behaviour change.
- Insight based upon the general findings from this date labels and storage guidance.
- Insight with reference to specific products, groups within the population, labels and label changes.

Considering the first of these, it is beyond the scope of the present study either to summarise or to systematically draw upon the rapidly burgeoning literature and practice in this field. However, WRAP's established 'Love Food Hate Waste' (LFHW) campaign is already thoroughly grounded in contemporary behaviour change thinking. High level contributions such as the recent 'Mindspace' report from the Institute for Government, as well as Brook Lyndhurst's own track record in conducting behaviour change research for government, have been drawn upon in developing the remainder of these recommendations.

Considering the insights based upon the general findings of this present research, we draw a single, strong conclusion, namely that further and continued effort to promote **improved food management skills** will be an essential component of maximising the effectiveness of any changes to date labels and/or storage guidance.

The nature and extent of food management skills has been shown as a key determinant both of food waste behaviours in general and of the use of date labels and storage guidance in particular. Improved skills – in terms of cooking, shopping and, most crucially, in-home stock management – all have the potential either to bring dates and/or storage guidance into use at a sufficiently early point to make a positive difference (i.e. before or 'upstream' of the eat/throw decision) or to boost self-confidence so that 'judgement' leads to better use of date labels and/or storage guidance.

To an extent, the means of achieving such improvements in skills and confidence are already in operation through the auspices of the LFHW campaign. What is being suggested here, therefore, is that key features of LFHW would need to be augmented, adjusted or refined specifically to align with changes in date labels and/or storage guidance. Entirely new mechanisms would not need to be developed.

The research has shown that, although complex, the various factors that influence the use of date labels and storage guidance can be grouped under three headings. It is recommended that communications to raise awareness of changes to date labels and/or storage guidance should be tailored along the following dimensions:

- **Age** – younger people and older people have demonstrated different behaviours with respect to date labels in particular and could be expected to have differential responses to changes in labelling. Engaging with young people, in particular, who appear more likely than older people both to rely on labels (since they appear less

confident about food generally, probably because they have spent fewer years buying, cooking and eating it, and possibly because of their different experiences of education and the different food products to which they have been exposed) and to have a premature safety default, would be important.

- **Products** – there are clear differences between the ways in which consumers treat different food products and in terms of the way they use date labels and/or storage guidance with respect to those products. Awareness raising about changes needs to be very clearly product specific rather than general: otherwise messages will not ‘stick’. Changes to, for example, labelling of chicken, will need to be advertised [in its generic sense] as about chicken and changes to, for example, yoghurt will need yoghurt-specific messaging even if the change in the date label or storage guidance appears the same.
- **Risk** – although they are not as easy to identify as either products or young people, the ‘risk averse’ constitute a group of consumers the behaviour of which is crucial. How they respond to changes in date labels and storage guidance will significantly dictate the efficacy or otherwise of the changes. Methods to communicate with the risk averse – possibly through non-food specific channels (e.g. health-related websites), possibly through product-specific in-store information, possibly through peer-to-peer social marketing – will need to be developed.

Further detailed work to develop the specifics of these propositions would, of course, be needed. However the last issue raised, of risk, introduces a further important point: namely, the prospect of ‘rebound’. Given the nature and complexity of the ‘sacred space’ surrounding food behaviours, it is easy to envisage that clumsy or ill-thought through interventions could actively repel consumers rather than engage them; but, and more awkwardly, it is possible that there could be unintended consequences arising from particular interventions. Drawing increased attention to date labels, for example, could increase the number of people falling into the ‘date label user’ category who – as we have seen – more often than average default to a ‘safety first’ position re dates. The consequence of higher awareness about date labels could, in such circumstances, lead to an increase in avoidable food waste rather than a decrease.

As with the development of the LFHW campaign itself, delicacy will be required and care will need to be taken to avoid – or, at least, account for – the various pitfalls and barriers to change that this research has suggested may occur. It is to these potential barriers that we now turn.

8.4.4 Key barriers to change

Barriers to change that have been identified by this research, and which will need to be accounted for in the development of any interventions associated with changes to date labels and/or storage guidance, are as follows:

Lack of concern about food waste

Despite declaring concern for food waste, this in-depth study of household food practices confirmed the findings of earlier research – namely, that avoiding food waste is not a top priority for many householders. A lack of concern for food waste may override interpretation of a date label and sensory judgements, and lead to food practices that are systematically wasteful:

M: It looked fine but I wasn't willing to risk it, or go to the effort with it.

MALE, 25, C1, NOTTINGHAM

Improving understanding of labelling information is unlikely to be sufficient to change values and attitudes around food waste, which demonstrates that interventions to improve understanding and use of date labels must be part of a wider, more holistic approach to tackling household food waste.

Food practices as non-negotiable ‘sacred space’

People’s food practices – their values, attitudes, behaviours, habits and so on – are underpinned by a complex array of social-psychological drivers, many of which are not ‘rational’ or even conscious. Improvements in information are, at best, likely to be slow to make an impression on deeply embedded food practices and, at worst, may make no difference at all. Food practices are often a ‘sacred space’ that people are simply unwilling to have questioned, challenged or changed. In this context, improving knowledge or understanding is unlikely, in the absence of some deeper engagement with the issues, to change behaviour:

W: It's not good to throw things away because it is a waste of money, I understand that, but the 'best before' date thing, I can't budge on that one.

FEMALE, 32, B, COVENTRY

The potentially limited impact of (new) knowledge and understanding was demonstrated by the fact that, even when people knew, for example, that ‘best before’ was a quality guideline, they still used it as a cut-off date due to a desire to eat only the best and freshest food. Similarly, people sometimes were aware (if they thought about

it) that their storage habits were sub-optimal in terms of maximising food's shelf-life, but continued with their habitual practices for other reasons – for example, fruit was often stored outside the fridge to encourage family members to eat it.

Confidence in understanding versus actual understanding

This research highlighted a disparity between consumers' confidence in their own understanding of date labels and the extent to which they actually understand them in reality. The online survey, baseline questionnaire and depth interviews all demonstrate that the majority of consumers report feeling highly confident in their own understanding of date labels – for example, 94% and 95% of online respondents said they found it easy to understand 'best before' and 'use by' labels respectively. However, actual understanding was lower – correct definitions were identified by 85% for 'best before' and 76% for 'use by' – and the depth interviews showed that the vast majority of people were not able, unprompted, to give a precise definition of date labels. On the other hand, some participants were open about their lack of understanding of date labels, stating that they had no desire to understand or use them anyway.

Neither of these attitudes – overconfidence or disinterest – represent fertile ground for interventions to improve understanding of date labels. If consumers do not realise they are misinterpreting and mis-using date labels, or feel that their ignorance is being exposed by efforts to improve their understanding, there is likely to be little demand for, or resistance to, improved understanding.

Familiarity breeds certainty and understanding; change is likely to increase uncertainty

The online survey results show that consumers better understand, and prefer, the labels with which they are most familiar. Changes to labelling may therefore be greeted with initial hostility and confusion by some consumers.

Getting the balance right between too much and too little information

The online survey results showed that the more information is introduced into a label, the less consumers understand it. This reflects the way in which consumers use food labelling in general – as a quick shortcut to aid decision-making. If a label is not interpretable at a glance, uncertainty and confusion are likely to increase and the label is unlikely to be valued by consumers. On the other hand, however, many participants suggested rewording labels to "spell out" what they mean, presumably by increasing the amount of information on them. Striking a balance between providing enough information and information of the right kind - in a simple, consistent and concise format - is difficult, especially across different product categories with different types of packaging.

There is no 'one size fits all' solution: participant suggestions for improvements to date labels and storage guidance

At the end of the depth interviews, participants were questioned along the following lines:

- If we wanted to help people understand and use date labels better (e.g. so they don't waste money by throwing away good food), what do you think would be the best thing to do?
- If we wanted to help people understand and use storage guidance correctly (so food doesn't go off early because of incorrect storage), what do you think would be the best thing to do?

The most common response to this broadly framed line of questioning was that people should be encouraged and helped to use their own judgement and common sense so that they would be *less* reliant on date labels:

M: For me it is more people need to know how to use their own judgement rather than knowing how to read dates on a packet, and I would sooner know how to tell when food is off rather than knowing what the dates mean and things like that.

MALE, 25, C1, NOTTINGHAM

When prompted specifically about improving on-pack labelling, responses were mixed and often contradictory. For example, a number of people suggested making date labels and storage guidance larger and bolder, whereas others thought that more prominent date labels might "scare people off", or perhaps amplify perceptions of food risk. Similarly, while some participants suggested "spelling out" the meaning of the different date labels more clearly on the pack, through either rewording or adding an explanatory note, others thought that packaging was already too overcrowded and any additions would simply confuse people more. A common response was that the date labelling system should be simplified so that they were only applied where safety might be an issue:

W: Simplifying the labels to one 'don't use after this' date for everything. It's either safe or it isn't. If it's safe then fine; if it isn't then they've told you don't use it after that date.

FEMALE, 62, C1, COVENTRY

One participant suggested removing the 'display until' date to avoid confusion:

M: I think they should get rid of the display until label, I mean that's just for the shops isn't it.

MALE, 48, C2, COVENTRY

A small number went further and suggested that date labels should be removed entirely, but the majority signalled that they would not be comfortable with this, except perhaps in the case of fruit and vegetables.

It was also common for participants to suggest that people needed to be more engaged with date labels, and many thought that television, particularly cooking programmes, would be a good way both to get information across to people, as well as increasing awareness of date labels as a tool.

To summarise, a mixed picture emerged when participants were asked to make suggestions about improvements to labelling. It is important to note that asking people out of context about their preferences may not reflect what people would actually look for or use in a food decision-making context. Nevertheless, the set of responses to these questions did reveal some common threads, which should be taken into consideration in the design of any initiatives or interventions:

- It seems that there was a prevalent feeling that date labels and storage guidance should not act as substitutes for personal judgement and, therefore, improvements in food management and planning skills would be an essential accompaniment to improved labelling information.
- There was also a widespread demand for simplification of the labelling system: many participants reported that they found date labels over-complicated and that the effort required to understand the detail outweighed the perceived potential benefits.
- There is no single solution that will fit everyone's requirements and preferences: changes to labelling may suit some people, but cause adverse reactions in others, and it is highly likely that many people will continue to interpret date labels in accordance with their own food habits and practices, regardless of guidelines and technical definitions.

8.5 Final summary

The full detail of the findings from this multi-stranded research programme makes clear the breadth and complexity of consumer behaviour in so far as it relates to the use of date labels and storage guidance on food.

It would be nice if things were simple and if the evidence pointed to a straightforward relationship between labels and behaviours. As is being discovered across a range of pro-environmental behaviours, however, it is simply not like that: values, habits and contexts collide and intertwine, vary between different domains of behaviour and vary again between different groups within the population.

In the present case, it would seem that there is indeed potential for changes in date labelling and storage guidance to make a positive contribution towards the goal of reducing avoidable food waste. This research has identified a specific range of changes that seem to have that potential. However, it can be concluded that these changes are unlikely to fulfil that potential unless there is a parallel 'behaviour change' programme which concerns itself with the details of the contextual settings within which labels and guidance are used. Though challenging, this would appear to be an achievable objective within the auspices of the current 'Love Food Hate Waste' programme.

The full prospective benefits of such a twin-track approach, in terms of potential tonnes of food waste avoided, have not been calculated for the purposes of this study. However, given some of the indicators in this research – the numbers of people that fail to understand key date labels, the kinds of clusters identified and the range in the propensity of different clusters to throw away food – the potential gains would appear to be significant.

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Appendix 1 Food diary recruitment pack

Overview

The aim of this project is to investigate attitudes and behaviours around food. We are interested in the decisions people make on a day to day basis, such as how and why they store, prepare, eat and dispose of different foods in different ways. The research is being conducted on behalf of the Waste and Resources Action Programme (WRAP).

In order to investigate these questions, we would like to recruit 60 people in three different locations (180 people in all) to fill in a food diary for two weeks, from Monday 17 May – Sunday 30 May inclusive.

In each location, we would like to recruit two groups of participants:

- **48 participants** should be recruited to complete a food diary for 2 weeks, plus a 10 minute telephone interview at the end.
 - All participants who submit a completed diary will receive a thank you of £50.
- **12 participants** should be recruited to complete the diary plus a 60 minute depth interview in their home
 - These participants will also be asked to collect their food packaging waste over the two weeks. They will be provided with labelled daily refuse sacks to put the packaging in. The sacks will be collected from them twice a week.
 - All participants who complete a diary (including collecting packaging) and a depth interview will receive a £40 thank you for the diary, plus an additional £40 thank you for the interview – i.e. £80 in total.
- All depth and telephone interviews will take place between 14 June and 16 July.
- We will inform participants that we reserve the right to withhold the incentive if diaries are not fully completed.

Key criteria

- Participants should be recruited according to quotas for age group, socio-economic group and household composition (questions 1 - 4).
- It is essential that we exclude people who never/rarely do the main shop and the cooking for their household (questions 5 and 6).

Participants must not be away from home for more than two nights over the two weeks (question 7).

Recruitment criteria

Table 1 – Recruitment criteria: DIARY ONLY PARTICIPANTS (48 IN EACH LOCATION)

Characteristic	Question	Categories	Quota/criteria
1. Age	How old are you?	<ul style="list-style-type: none"> a. 18-25 b. 26-40 c. 41-55 d. 56-65, e. 65+ 	<ul style="list-style-type: none"> a. At least 6 b. At least 10 c. At least 10 d. At least 6 e. At least 8
2. Gender	Are you:	<ul style="list-style-type: none"> a. M b. F 	
3. Household composition	Are you:	<ul style="list-style-type: none"> a. Living on your own b. Living with 1 or more adults and no children c. Living with 1 or more children and no adults d. Living with 1 or more children and 1 or more adults 	<ul style="list-style-type: none"> a. At least 8 b. At least 10 c. At least 8 d. At least 16
4. SEG	What is the occupation of the chief income earner in your household?	<p>Occupation:</p> <p>Qualifications:</p> <p>Number in charge of:</p> <p>Occupation grade:</p> <ul style="list-style-type: none"> a. A 	<p>Except for SEG A, at least two age groups to be represented within each SEG</p> <p>A. At least 1</p>

		b. B c. C1 d. C2 e. D f. E	B. At least 8 C1. At least 11 C2. At least 8 D. At least 7 E. At least 4
5. Main shopper?	Which statement best describes you?	a. I always do the main shop for my household b. I almost always do the main shop for my household c. I usually do the main shop for my household d. I share responsibility for the main shop for my household with others e. I rarely or never do the main shop for my household	Strictly only those who answer a. or b. or c. or d. Always/almost always/usually/share responsibility
6. Main food preparer?	Which statement best describes you?	a. I always do the cooking for my household b. I almost always do cooking for my household c. I usually do the cooking for my household d. I share responsibility for the cooking in my household with others e. I rarely or never do the cooking for my household	Strictly only those who answer a. or b. or c. or d. Always/almost always/usually/share responsibility
7. Holiday/away from home exclusions	Will you be away from home for more than two nights between Monday 17 May and Sunday 30 May 2010?		If yes, exclude

8. Occupation/industry exclusions	Do you, or have you ever, worked in the following occupations:	a. Advertising b. Market research c. Marketing	If yes to any, exclude
9. Availability for telephone interview (all interviews to take place between 14 June – 16 July)	Please specify the days and times you are most likely to be available for a 10 minute telephone interview, and the best number(s) to call you on.		

Table 2 – Recruitment criteria: DIARY-DEPTH PARTICIPANTS (12 IN EACH LOCATION)

Characteristic	Question	Categories	Quota/criteria
1. Age	How old are you?	a. 18-25 b. 26-40 c. 41-55 d. 56-65 e. 65+	a. At least 2 b. At least 2 c. At least 2 d. At least 2 e. At least 2
2. Gender	Are you:	a. M b. F	
3. Household composition	Are you:	a. Living on your own b. Living with 1 or more adults and no children	a. At least 2 b. At least 2

		<ul style="list-style-type: none"> c. Living with 1 or more children and no adults d. Living with 1 or more children and 1 or more adults 	<ul style="list-style-type: none"> c. At least 2 d. At least 2
4. SEG	What is the occupation of the chief income earner in your household?	<p>Occupation:</p> <p>Qualifications:</p> <p>Number in charge of:</p> <p>Occupation grade:</p> <ul style="list-style-type: none"> a. A b. B c. C1 d. C2 e. D f. E 	<p>Except for SEG A, at least three age groups to be represented within each SEG</p> <ul style="list-style-type: none"> A. At least 1 B. At least 2 C1. At least 2 C2. At least 2 D. At least 2 E. At least 1
5. Main shopper?	Which statement best describes you?	<ul style="list-style-type: none"> a. I always do the main shop for my household b. I almost always do the main shop for my household c. I usually do the main shop for my household d. I share responsibility for the main shop for my household with others e. I rarely or never do the main shop for my household 	<p>Strictly only those who answer a. or b. or c. or d.</p> <p>Always/almost always/usually/share responsibility</p>
6. Main food preparer?	Which statement best describes you?	<ul style="list-style-type: none"> a. I always do the cooking for my household b. I almost always do cooking for my household c. I usually do the cooking for my household 	<p>Strictly only those who answer a. or b. or c. or d.</p> <p>Always/almost always/usually/share responsibility</p>

		<p>d. I share responsibility for the cooking in my household with others</p> <p>e. I rarely or never do the cooking for my household</p>	
7. Holiday/away from home exclusions	Will you be away from home for more than two nights between Monday 17 May and Sunday 30 May 2010?		If yes, exclude
8. Occupation/industry exclusions	Do you, or have you ever, worked in the following occupations:	<p>a. Advertising</p> <p>b. Market research</p> <p>c. Marketing</p>	If yes to any, exclude

Appendix 2 Baseline food attitudes and behaviours questionnaire

Before you start your Kitchen Diary, please fill in this Food Questionnaire and return it to us in the small pre-paid envelope (no stamp required). It should take about 15 minutes. Please send the questionnaire back to us as soon as you can, and by Tuesday 18 May at the latest.

Your name:
Location:

Part 1 – Food shopping

Q1 How often, generally speaking, do you do:

A] A main food shop? (i.e. buy for several meals, stock-up on snacks and foods for general use in the house) Please tick one.

More than twice a week	Twice a week	Once a week	Every other week	Once a month	Never	N/A

B] A smaller 'top-up' shop? (i.e. buy a few items for a meal, replacing bread/milk etc) Please tick one.

More than twice a week	Twice a week	Once a week	Every other week	Once a month	Never	N/A

Q2 Where do you normally shop? (Tick all that apply)

Aldi		Morrison's	
Asda		Sainsbury's	
The Cooperative (Co-op)		Somerfield	
Lidl		Tesco	
Marks & Spencer		Waitrose	
Online (please specify):		Other (please specify):	

Q3 Do you buy food from other sources on a regular basis? (Tick all that apply)

Local/corner shop		Butcher/Fishmonger	
Green Grocers		Bakers	
Market		Box scheme	
Health food shop			
Other (please specify):			

Q4 How often do you check what you have at home before you go food shopping (e.g. in the cupboards, fridge, or freezer)? (Please tick one)

Always	Most of the time	Some of the time	Rarely	Never	N/A

Q5 How often do you:

A] Plan what you are going to buy before you go shopping? (Please tick one)

Always	Most of the time	Some of the time	Rarely	Never	N/A

B] Take a list when you go shopping? (Please tick one)

Always	Most of the time	Some of the time	Rarely	Never	N/A

C] If/when you have a list, how do you use it? (Please tick the ones that apply)

I only buy what is on my list	
I use my list as a guide, but also buy extras and substitutes for what is on the list	
I don't usually look at it/remember to look at it	
N/A (I don't make lists)	

Q6 How important are the following when you are choosing what food to buy? (Please tick one box for each consideration)

	Not at all important	Not very important	Neither	Quite important	Very important	N/A
Brand						
Health						
How easy to prepare/cook						
How long until it goes off						
Price						
Quality						
Freshness						
Storage space at home						
Taste						
What I/we normally eat						
Stocking up so I don't need to go shopping too often						

Q7 Do you or anyone else in your household have a dietary restriction (e.g. allergies, vegetarian, vegan, coeliac, cholesterol, blood sugar)? Please circle one.

YES / NO

If yes, please tick all that apply.

Allergy		Vegetarian	
Coeliac		Weight Reduction	
Dairy Intolerance		Wheat Intolerance	
Vegan		Diabetic	
Other (please specify):			

Q8 When shopping, do you look out for products which are...?(Tick all that apply)

	Always	Most of the time	Some of the time	Rarely	Never	N/A
Organic						
Locally Produced						
British						
Free Range						
Fair Trade						

Q9 When food shopping, how often do you:

	Always	Most of the time	Some of the time	Rarely	Never	N/A
Choose the product with the longest sell by/expiry date?						
Buy products that are reduced because they are near their sell by date?						
Check the pack for how the food should be stored at home (e.g. if it can be frozen)?						

Part 2 - Food preparation & cooking

Q10 Approximately how often do you:

	5-7 days a week	2-4 days a week	Once a week	1-3 times a month	Rarely	Never	N/A
Cook your main meal from scratch, or mostly from scratch?							
Eat ready meals as your main meal?							
Eat out for your main meal?							
Get take away for your main meal?							
How often do all the members of your household eat the same main meal?							

Q11 What do the date labels on food packaging tell you?

--

Q12 How often do you:

	Always	Most of the time	Some of the time	Rarely	Never	N/A
Keep an eye on food dates so you know what needs eating when?						
Use up foods in the fridge before going shopping again?						
Use leftovers for lunch/other meals?						
Make use of fruit and vegetables that may be past their best in dishes like soups, smoothies and casseroles						
Seek out recipes to help use up food that is approaching the date on the label?						

Q13 To what extent do you:

	Always	Most of the time	Some of the time	Rarely	Never	N/A
Make sure you follow storage instructions on food packaging?						
Freeze home made meals, leftovers or food that you've bought but not used?						
Use guidance on food packaging to tell you where to store food (e.g. in the fridge, freezer, a cool dark place)?						
Use guidance on the packaging to tell you how long to keep food that you have opened but not finished (e.g. 'Once opened, use within 3 days')?						

Q14 Thinking about the different types of food waste that may occur, how much uneaten food, overall, would you say you generally end up throwing away? (Tick one)

Quite a lot	A reasonable amount	Some	A small amount	Hardly any	None	Don't know

Q15 Thinking about when you have to throw food items away, to what extent, if at all, does it bother you? (Tick one)

A great deal	A fair amount	A little	Not very much	Not at all	Don't know

Q16 How much effort do you and your household go to in order to minimise the amount of uneaten food you throw away? (Tick one)

A great deal	A fair amount	A little	Not very much	Not at all	Don't know

Q17 What do you normally do with waste food? (Tick one)

I usually put it in a special container to be collected by the council	
I usually put it in the bin	
I usually compost it in my own garden	
Other (please specify)	

Part 3 – And finally...

Q18 To what extent do you agree or disagree with the following statements?

	Strongly agree	Tend to agree	Neither	Tend to disagree	Strongly disagree
I worry about the cost of uneaten food which gets thrown away					
Food thrown away is not an issue because it is natural and biodegradable					
I worry about how safe it is to reheat leftovers that have been kept in the fridge for one or two days					
I'd rather throw food away than risk food poisoning					
I'd rather throw food away than eat it when it's past its best					
I enjoy cooking and trying new foods and recipes					
Discarded food packaging is a greater environmental issue than food thrown away					
It would be difficult for me/my household to reduce the amount of food we throw away					
Nothing would encourage me/my household to try and throw less food away					

Q19 To what extent do you agree or disagree with the following statements?

	Strongly agree	Tend to agree	Neither	Tend to disagree	Strongly disagree
We are close to the limit of the number of people the earth can support					
The Earth has very limited room and resources					
The environment is a low priority for me compared with a lot of other things in my life					
It's not worth Britain trying to combat climate change, because other countries will just cancel out what we do					
I don't believe my behaviour and everyday lifestyle contribute to climate change					
It takes too much effort to do things that are environmentally friendly					

Appendix 3 Kitchen diary



Kitchen Diary
Monday 17th - Sunday 30th
May 2010

Name:

Location:

Welcome to the Kitchen Diary!

First of all, thank you very much for agreeing to take part in this important piece of research by filling in your Kitchen Diary. The research findings from this activity will be used to improve our understanding of how and why people make decisions about food.

Pre-diary questionnaire

Before you start your Kitchen Diary, please fill in the Food Questionnaire and return it to us in the small pre-paid envelope (no stamp required). Please send the questionnaire back to us as soon as you can, and by Tuesday 18 May at the latest.

Kitchen diary

We would like you to fill in your diary over a period of two weeks, starting on Monday 17 May through to (and including) Sunday 30 May 2010.

Please keep a record of food that is disposed of in your household over the two weeks. The following list shows what we would like you to record, as well as some things you do not need to record.

Please record:



Any food or drink that could have been eaten or drunk, but doesn't get eaten or used and is thrown away.

For example:

- Food or drink (e.g. milk, fruit juice) that has gone off
- Food or drink that has gone past its date
- Food or drink that you bought but didn't need or want in the end
- Food or drink that you opened and ate some of, then threw the rest away



Leftovers that you kept but ended up not using.



You should record food that goes into the bin (or down the sink, or onto the compost heap) **at home**.

No need to record:



Any food that can't be eaten.

For example:

- vegetable peelings
- apple cores
- tea bags
- bones



Scraps left on your plate after a meal that go straight in the bin/kitchen caddy/onto the compost heap.

Unfinished tea or coffee



You do not need to record food that is thrown away anywhere else, such as at **work or school**.

We are interested in the types of food that are thrown away in different types of normal, busy household. Please be as accurate as possible, and don't do anything differently to what you normally do. We have included a sticker for you to put somewhere in your kitchen (for example, on your bin) to remind you to fill in your diary.

Every day over the two weeks, we would like you to record the food that is thrown away in your household, using the recording tables printed on each page of the diary. Please take care to fill in as many of the questions as you can for each item, and make sure you put the date at the top of each record. There is one page for each item you throw away.

We would like you to tell us a few details about what you throw away. Please be as descriptive as possible as this will help us report the results accurately.

To record the quantity of each item you dispose of, you can use the following measurements:

- A whole
- Half
- Quarter
- Less than a quarter
- A handful
- A tablespoon
- A teaspoon
- Number

For example:

1. What did you throw away?

Description:

King Edward potatoes

Pack size

1kg

(if applicable):

Brand

(if applicable): *Tesco*

2. How much did you throw away?

Quantity: *4*

1. What did you throw away?

Description:

Peach yoghurt

Pack size

150g

(if applicable):

Brand

(if applicable): *Ski*

2. How much did you throw away?

Quantity: *Half*

At the beginning of the diary, we have included two examples of completed pages so that you know how to go about filling it in the records.

When you have finished the diary, please send it back to us in the large envelope provided (no need for a stamp). It is important that you send it back to us as soon as you've finished it, and by Wednesday 2 June at the latest.

If you run out of room in your diary, you can call us on the number below and we will put some extra recording sheets in the post for you. If you have any other problems or questions about the diary, you can call Annie on 020 8846 2060.

Thanks again for your time, and we hope you enjoy your Kitchen Diary!

wrap

BROOKLYNDHURST

Day: *Monday*

Date: *10/05/2010*

1. What did you throw away?

Description:

Tomatoes

Pack size

(if applicable): *300 g*

Brand

(if applicable): *Tesco*

2. How much did you throw away?

Quantity: *3*

3. How important were the following as reasons why you threw it away?

		Less important			More important		
	N/A	1	2	3	4	5	
It looked/smelt off	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
It was after the date on the label	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
I had nowhere to store it	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
I didn't like it/want to eat it	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
I replaced it with a new one	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
It had been opened too long	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Other (please specify)

Comments: *They went all wrinkled*

4. Was there a date on the pack?



Yes



No



Don't know

If yes, a) what kind of date was it and
b) what was the date?

a) Kind of date:

Best before end

b) Date:

29 April 2010

5. Where was it stored?



Fridge



Freezer



Cupboard



Other, please specify:

6. How was it stored? (tick as many as apply)



In original packaging



Loose



On a plate or bowl



In a container e.g. tupperware



Other, please specify:

7. When did you decide to throw it out?



Around meal-time
(preparation, cooking)



When putting things away after
shopping



When having a snack



Clearing out the cupboards/
fridge/freezer



Checking the cupboards
before shopping



Noticed it while doing/looking for
something else



Other, please specify:

Appendix 4 Diarists' depth interview topic guide

Central aim of depth interview: to explore with participants their understanding, interpretation and use of date labels and storage guidance, using the diaries as a prompt and taking a 'whole food journey' approach where possible.

Key research questions to bear in mind (findings of depth interview will be organised under these headings).

- When are date labels used and why?
- How are date labels used and interpreted?
- How much does a lack of understanding/uncertainty around date labels contribute to food waste?
- How much would improving understanding/trust in/format of date labels reduce avoidable food waste?

- How does the interaction between date labels and storage guidance influence how they are used and interpreted?
- How does the interaction between date labels and storage guidance impact on trust in either/both?

- To what extent do people refer to storage guidance, and when?
- How do people understand and use storage guidance – how strong an influence is it on food storage decisions/habits?
- Do people perceive storage guidance as inconsistent/confusing? Implications for food waste?
- What scope is there for improving storage guidance to reduce food waste?

Time (approx)	Instructions	Purpose of section
2 mins	Introduction <ul style="list-style-type: none"> • Introduce yourself and Brook Lyndhurst • Purpose of the interview: <ul style="list-style-type: none"> ○ We want to explore what you wrote in your diary and questionnaire in a little more depth, to understand what kind of foods get thrown away in your household and why this happens. ○ Explain the need for honesty – we need to understand what happens in normal, busy households with lots going on. Nothing is 'right' or 'wrong', we want to know your real views. ○ We will tell you a little bit more about the project at the end of the interview • Confidential, but recorded <ul style="list-style-type: none"> ○ voice recording used as back-up ○ get permission 	Warm up.
Es		
< 5 mins	Part 1 – How did you find the kitchen diary? <ul style="list-style-type: none"> • How did you find filling in your kitchen diary? [Keep this question open. Give them a minute to think if they need it – it was a while ago now. Let them leaf through the diary if they want to – it might jog their memory] <p>If needed, prompt on following:</p> <ul style="list-style-type: none"> • Were you surprised by how much or how little you threw out? • Has it impacted on you? Did you learn anything, did the way you feel about food or food waste change, are you doing anything differently to before? • Any general thoughts about the diary? <p>Ask about anything odd or missing in the diaries</p>	<p>Aim: Icebreaker, get general thoughts on diaries, allow participants to get anything off their chest and share their views.</p> <p>Keep this general to start with – don't prompt on dates/storage guidance. Do they mention anything about it unprompted?</p>

10-15 mins	<p>Part 2 – Diary journeys – date labels</p> <ul style="list-style-type: none"> Pre-select two interesting diary entries. Ideally one perishable, one not. Looking at one 'use by' and one 'best before' if possible, either when things have been thrown out earlier than use by, or strictly on best before, and possibly one entry involving own sensory judgement. <p>Use the diary as a prompt to show them what they wrote, and discuss that instance as a probe on more <i>general</i> behaviours -</p> <p>Talk them through the whole 'food journey'</p> <ul style="list-style-type: none"> Pre-shop stock check (clear-out) Meal planning (was it meant for a specific meal?) During the shop (Offer? Impulse purchase? Pack size?) Post-shop unpacking (replacing items? Making space?) In the home (storage space, changed plans, not feeling like it? Found you did not like it?) <ul style="list-style-type: none"> What did you buy it FOR? Was it ever used.... what were the factors that led up to it being thrown out? Discuss the 'relative whys' (as rated in diary question 3) behind the chucking-out decision. <i>Don't emphasise dates:</i> get a broad picture of what is happening. Let them talk first, prompt lightly but only based around what was in the diary. 	<p>Aim: eliciting information about understanding and use (or lack thereof) of date labels, in context of real life situations</p>
10-15 mins	<p>Part 3 – Date label discussion</p> <p>Having discussed the diary 'journeys', in this section steer the participant towards specific discussion of date labels [do not worry if this has come up in an unprompted way above].</p> <ul style="list-style-type: none"> Use Q11 from the baseline questionnaire as a prompt: "<i>In the baseline questionnaire, in response to the question "what do the date labels on food packaging tell you" you wrote _____. Do you want to explain a bit more about what you meant?"</i>" – leave open at first. <p>Prompting:</p> <ul style="list-style-type: none"> If they have specifically named dates but not defined them, ask <i>what can you tell me about these dates? Are they different? Are there other kinds of dates?</i> Now move into a more general discussion of their use of dates <ul style="list-style-type: none"> <i>How much did you think about date labels before you did the diary?</i> <i>Have you learnt more about it from the diary?</i> <i>How do you interpret and use date labels, and why?</i> Probe further on 'working definition' elements, using examples from the food diary. Specifically: <ul style="list-style-type: none"> Do you use date labels as a guide with your own judgement? Ignore and use own judgement? Do you use them after the date? Use by/best before? Different foods? 	<p>Aim: in depth discussion of understanding and use of date labels</p>

- Are you very cautious e.g. leave a buffer? [Is this done intentionally (or because of uncertainty)? If so why?].
- Different for different foods?
- Different in different *contexts*? – Particularly probe around guests, children (if they have).
- Do you use them inconsistently?
- Do you trust them? Does it depend on the product/brand/supermarket?

- *What, if anything, were you particularly confused/uncertain about before?*
- *What, if anything, are you still confused/uncertain about?*
- *Do you understand labels better or use them differently as a result of doing the diary?*
- *Which particular aspects of these labels have been clarified, if any?*

10 mins

Part 4 –Diary journeys – storage and storage guidance

Again use the diary as a prompt. We will pre-select a minimum of two items/entries – one which they report to have kept in original packaging (if possible with the storage guidance information looked up), and one which is stored outside of original packaging. We want to know:

- What do they do in the absence of storage guidance? [Talk about as many stages of the food cycle as possible, using the diary as a prompt]
 - Unprompted: *why did you store it there?*
 - Then explore: habit, what family do, storage available, appearances (e.g. fruit bowl).
- Do they use storage guidance when it *is* available?
 - Unprompted: *why did you store it there?*
 - Habit, what the family do, meal planning, in the shop, what looks nice etc....
 - Lastly, compare what they did with the storage guidance that was available – gauge reaction:
 - *Have you seen this before/noticed it? Do you tend to look at storage guidance?*
 - *Are there certain products you would use it more for?*
 - *Are there products/times you would never both looking at it?*

Aim: eliciting info about use of storage guidance in context of real life situation

In depth discussion of how and why people use/do not use on-pack storage guidance

Exploration of the links between date labels and storage guidance

5 mins	<p>Part 5 - Storage and storage guidance discussion</p> <ul style="list-style-type: none"> Lastly show them the storage guidance for the packaged product and gauge reaction – have they noticed it? Do they tend to look at it? (If possible have two - one correct and one incorrect.) Are there any products/situations they can think of when they do look at it? Why? What about the 'how long' guidance? (see Question 3 'it had been opened too long' and see if that is based on guidance or judgement?) <p>Links between dates and storage</p> <ul style="list-style-type: none"> Can you see any links between dates labels and storage guidance? Do you ever use them in conjunction with each other? If so, how? (Use an example from the diary to help if necessary). Are there any situations in which you're uncertain about how the two should be used together (e.g. freezing/dates)? 	
5 mins	<p>Part 6 - Possible changes to date labels/storage guidance</p> <p>Thinking about the way date labels and storage guidance are presented on packaging currently, what needs to change? What do you think would help people?</p> <ul style="list-style-type: none"> If we wanted to help people understand & use date labels better (e.g. so they don't waste money by throwing away good food), what do you think would be the best thing to do? <ul style="list-style-type: none"> Do you think that knowing the difference between types of dates would help? What about improving trust in date labels? Could that be improved? How? Changing the presentation of the labels? (size, prominence, colour) Removing 'display until' and 'sell by' dates? Standardising the type of date label on product types (e.g. all breads the same, all yoghurts) Taking dates off fruit & vegetables? If we wanted to help people understand and use storage guidance correctly (so food doesn't go off early because of incorrect storage), what do you think would be the best thing to do? <ul style="list-style-type: none"> Type/content of the guidance Presentation – size, location on-pack, use of logos Consistency of presentation/instructions? <p>Are there other things which would help households reduce food waste?</p>	<p>Aim: to collect consumer views on how labels could be made clearer.</p> <p>Get as much unprompted information as possible before prompting on specific questions.</p>
5 mins	<p>Part 7: Closing</p> <p>Clarifications of baseline questionnaire:</p> <ul style="list-style-type: none"> Highlight anything unusual in questionnaire before you go, such as double markings etc and ask them to clarify. 	

- If they chose 'local/corner' shop, find out which one it was.

Any questions?

Permission to recontact (in case of further questions or future research)

Thank and close

Appendix 5 Diary follow-up telephone interview topic guide

Central aim of telephone follow-up: to question participants about their understanding, interpretation and use of date labels and storage guidance, using questionnaires and diaries as prompts.

Key research questions to bear in mind (findings of telephone interview will be organised under these headings).

What are the implications of all of the following for household food waste?

- When are date labels used and why? (at what point in food journey, and with regard to what types of product – new, habitual etc)
- How are date labels used and interpreted?
- How much does a lack of understanding/uncertainty around date labels contribute to food waste?
- What scope is there for improving date labels to reduce food waste?
- How does the interaction between date labels and storage guidance influence how they are used and interpreted?
- How does the interaction between date labels and storage guidance impact on trust in either/both?
- To what extent do people refer to storage guidance, and when? (again, food journey plus types of foods/contexts etc)
- How do people understand and use storage guidance – how strong an influence is it on food storage decisions/habits?
- Do people perceive storage guidance as inconsistent/confusing? Implications for food waste?
- What scope is there for improving storage guidance to reduce food waste?

Time (15 mins)	Instructions	Purpose of section
1 min	<p>Introduction</p> <p>Make sure that you have read and compared – and have in front of you – both the 'Food Questionnaire', the 'Kitchen Diary' and the summary demographic details from the questionnaire data recording spreadsheet. Check the postcode or address to see whether the interviewee lives in a rural or urban location. Bear these in mind throughout the interview in order to identify possible patterns.</p> <ul style="list-style-type: none"> • Introduce yourself and Brook Lyndhurst; remind them about the kitchen diary. • Purpose of the phone interview: <ul style="list-style-type: none"> ◦ We want to have a quick chat about your questionnaire and how you felt the diary went, and clarify a couple of points. • No answer is 'right' or 'wrong' – we want to understand their views • Confidential (their name won't appear anywhere on anything) <p>"The interview shouldn't take any more than about 15 minutes. We are particularly interested in your experience of the Kitchen Diary and the Food Questionnaire. So it would be helpful for us to talk to you a little bit about your experience with the Kitchen Diary."</p>	<p>Warm up, explain purpose of interview.</p>

Es

2-3 mins

Part 1 – Experience of filling in diaries

- **How did you find filling in your kitchen diary?**

Keep this question open. Give them a minute to think if they need it – it was a while ago now.

If needed, prompt on following:

- Were you surprised by how much or how little you threw out?
- Did you find yourself doing anything different during or after the diary?
- Any general thoughts about the diary?

Ask about anything odd or missing in the diaries

Consider:

- Keep this general to start with – don't prompt on dates/storage guidance. Do they mention anything about it unprompted?
- If it made them do things differently, do they think they'll carry on?
- Did it make them *think* about things differently? How typical is the behaviour recorded in the diary?

And:

1. *I worry about the cost of uneaten food which gets thrown away.*
2. *I'd rather throw food away than risk food poisoning.*
3. *I'd rather throw food away than eat it when it's past its best.*
4. *It would be difficult for me/my household to reduce the amount of food we throw away.*
5. *Nothing would encourage me/my household to try and throw less food away.*

10 mins

Part 2 – Discussion of date labels and storage guidance

Using diary

Select 2 diary entries which relate to or are illustrative of:

- *our RQs on date labels;*
- *our RQs on storage guidance.*

Ask participants to talk through their 'food journey' for these entries, with particular reference to their use of on-pack information. Spend 3-4 minutes on each.

"I've got your diary here in front of me and I'm looking at an entry you made on XX, when you threw away XX, for XX reasons. Can you remember enough to tell me a bit more about the story of why this ended up going in the bin? I'm particularly interested in whether you used any information or labels on the packaging when you decided to throw it away."

If needed, prompt on decisions made at:

- pre-shop/point of purchase (why did they buy it; planned or spontaneous

Select diary entries which include something about dates and storage. E.g.

- Something thrown away on or before a date
- Incorrect storage led to something going off
- If possible choose 1 date and 1 storage entry

Aim: to get a qualitative sense of the context and detail of those diary entries, and whether this is typical behaviour for that person. To shed qualitative light on the detail of the RQs on page 1.

After an initial 20 interviews, we will pre-code a set of options to help us content analyse the subsequent interviews.

- purchase?; habitual or one-off?; is this the kind of thing they would look at the date label or storage guidance for when shopping? Why/why not?)
- unpacking/storage – why did they store it in that way? Did they use the label? Why/why not? What about freezing it?
- pre-cooking – did they try and use it up? Did they forget they had it?
- cooking/snacking/eating – what drove the eat/chuck decision? Did they use any labels to help them decide?
- Disposal – were there any alternatives to throwing it away?

NB May only have time to cover one entry or one theme (e.g. I notice that you often said that XX was an important reason for throwing things away – can you tell me a bit more about that...?)

Using Q11 from questionnaire (open question on date labels):

Remind them what they wrote on their questionnaire. Talk about this further, with comparisons with their diary entries.

If they have provided an imperfect answer, push them on it, incl. specific questioning on the meaning of different dates (keep prompting to a minimum if possible).

- **Does participant distinguish between different dates, and do they define them correctly? If not, what do they get wrong?**

Prompt on:

- Do you understand labels (both dates and storage) better or use them differently as a result of doing the diary?
- Which particular aspects of these labels have been clarified, if any?
- What, if anything, were you particularly confused/uncertain about before?
- What confusion/uncertainty, if any, remains?

Scope for improvement/change

- If we wanted to help people to use date labels and storage guidance better (e.g. so that they avoid wasting money by throwing out good food), can you think of anything that could be done? (packaging/labelling/in-store comms)
- What else could be done other than improvements to packaging?

1 minute	Part 3 – Clarification of any blanks/queries in questionnaire <i>Ask about blanks/ambiguities on the questionnaire (if any).</i> Clarify the local/corner shop issue if necessary (i.e. their nearest supermarket may also be their local store, rather than a corner shop) Please ask for their employment status – part time, full time, retired, unemployed, student	
	Give them a chance to ask any questions Ask for permission to recontact Thank and close	

Further info (if requested by participant)

Why are we doing this research?

WRAP, the Food Standards Agency (FSA), representatives from the food industry, consumer groups, and UK Government departments are working closely to help reduce household food waste. One element of this work is to improve consumer understanding of date labelling and food storage guidance, and how they are applied. The purpose of this work is to understand the **impact** date labelling and storage guidance changes could have on reducing household food waste.

What do the dates really mean?

- **'Best before'** These dates refer to quality rather than food safety. Foods with a best before date should be safe to eat after the 'best before' date, but they may no longer be at their best. (One exception is eggs - never eat eggs after the 'best before' date.)
- **'Use by'** These dates refer to food safety. Never eat products after this date, and follow the storage instructions. 'Use by' does not always mean 'eat by'. If a food can be frozen its life can be extended beyond the 'use by' date.
- Date marks such as **'display until'** often appear near or next to the 'best before' or 'use by' date. They are used by some shops to help with stock control and are instructions for shop staff, not shoppers. (Historically, 'sell by' dates have also been used for this purpose but less so now.)
- If they want more info, refer them to http://www.lovefoodhatewaste.com/save_time_and_money/food_dates or <http://www.eatwell.gov.uk/foodlabels/understandlabels/>

Appendix 6 Accompanied shoppro-forma

Name	List? Y / N
Location	
Retailer	

Central aim of accompanied shop: to explore whether/how date labels and storage guidance are used by participants at the point of purchase and when unpacking shopping.

Key research questions to bear in mind (findings of accompanied shops will be organised under these headings)

- To what extent is packaging information on dates and storage used at point of purchase and when unpacking shopping?
 - How are date labels used and interpreted at point of purchase and when unpacking shopping?
 - To what extent do people refer to storage guidance at point of purchase and when unpacking shopping, and how do they use this information?
 - Does use of packaging info vary across products?
 - How does use of packaging information vary across different types of purchase (habitual/spontaneous/considered etcetc)
- What scope is there for improving communication of this information to consumers?
- Is there scope for changes to this information to influence food waste?

Instructions

- Ask participant to talk you through their decisions as they shop and then at home as they unpack: what are they buying; why; how are they deciding what to choose; how are they deciding where/how to store/are any disposal decisions made?
- Ask participant to tell us as much detail as they can, and to mention things even if they don't think it's worth mentioning. Tell them at the beginning that we are specifically interested in how they use labels/on-pack info.
- Observations to be recorded below. Record what participant considers when making a decision, including non-date label/storage guidance factors.
- Prompting to be kept to a minimum – do not prompt specifically on date labels or storage guidance during the shop or while they unpack (use interview for detailed questions). If they seem to be looking at dates/storage but don't verbalise it, flag and ask about it later in the interview.

	Product description (inc brand, pack size etc where applicable)	In-store			At home		
		Refers to date label(s)	Refers to storage guidance	Observations on use of dates/storage guidance Observations on decision-making	Refers to date label(s)	Refers to storage guidance	Observations on use of dates/storage guidance Observations on decision-making
0.	Hovis medium sliced white loaf 800g	✓		Checked tags, selected longest bb date. Couldn't remember whether he had any left at home. Said he would freeze new loaf if there was some at home.			No reference to storage instructions on-pack. Realised he already had half an open loaf in bread bin so stored new loaf in freezer.

	Product description (inc brand, pack size etc where applicable)	In-store			At home		
		Refers to date label(s)	Refers to storage guidance	Observations on use of dates/storage guidance Observations on decision-making	Refers to date label(s)	Refers to storage guidance	Observations on use of dates/storage guidance Observations on decision-making
1.							
2.							

All extra sheets used should be marked clearly with participant's name, and products should be numbered.
Any notes on disposal decisions that occur during unpacking should be recorded on a separate sheet and kept together with this pro-forma.

Appendix 7 Post-shop interview topic guide

Central aim of post accompanied shop interview: to observe storage (and possibly disposal) decisions and explore whether/how storage guidance and date labels are used in these; to explore with participants how and why date labels and storage guidance are used when making purchasing decisions.

Key research questions to bear in mind (findings of the interview will be organised under these headings)

What are the household food waste implications of the following?

- To what extent is packaging information on dates and storage used at point of purchase and when unpacking shopping?
 - How are date labels used and interpreted at point of purchase and when unpacking shopping?
 - To what extent do people refer to storage guidance at point of purchase and when unpacking shopping, and how do they use this information?
 - Does use of packaging info vary across products? (e.g. new/habitual products; high/low perceived risk; perishable/non-perishable; opened, unopened)
 - How does use of packaging information vary across different types of purchase (habitual/spontaneous/considered etcetc)
- What other factors drive storage decisions, and how do these link to on-pack dates and storage guidance?
- What factors drive disposal decisions, and how do these link to on-pack dates and storage guidance?
- How are dates and storage guidance used in conjunction with one another to make storage/disposal decisions?
- What scope is there for improving communication of this information to consumers in a shopping context?
- How might improved communication of this information influence food waste?

Time (45 mins)	Instructions	Purpose of section
5-15 mins	<p>Part 1 – Unpacking shopping</p> <ul style="list-style-type: none"> On arrival back at their home, ask participant to talk you through the decisions they're making as they unpack their shopping, in exactly the same way they talked you through what was going through their minds at the shop. Again, keep prompting to a minimum – this section is primarily observational. Observations to be recorded in the appropriate columns of the pro-forma. 	Observe storage and disposal decisions
Es		
2-3 mins	<p>Part 2 – Intro to interview</p> <p>Once shopping is unpacked, begin the interview (approx 30 mins)</p> <ul style="list-style-type: none"> Purpose of the interview: <ul style="list-style-type: none"> To ask them some questions about how they made the decisions in the shop and while they unpacked No answer is 'right' or 'wrong' – we want to understand their views Confidential (their name won't appear anywhere on anything) Permission to record 	
15-20 mins	<p>Part 3 – Discussion of use of date labels and storage guidance while shopping and unpacking</p> <p>Use a similar 'journey/story' technique as we used for the diary-based interviews As prompts for this 'journey/story', use:</p> <ul style="list-style-type: none"> your shopping/unpacking observations pro-forma if participant is willing, look in their fridge and cupboards (for questioning around opened/part used products) <p>Use these as a basis to talk about what they 'normally' do with this type of product.</p> <p>Focus on products that are illustrative of our RQs (anything interesting re use/non-use of storage guidance or dates; interesting storage decisions; etc). Choose observations that relating to a range of products, including</p> <ul style="list-style-type: none"> perishable/non-perishable; fruit-veg/meat dairy (i.e. perceived low risk/high risk)); products where they did/did not use date labels; products where they did not products that are stored differently (refrigerated; frozen; stored in cupboard; stored in fruit bowl etc) 	Aim: build up qualitative insight into how and why people are using/not using packaging information in their decision-making.

Consider the following questions.

- How helpful/unhelpful do you find packaging information on dates and storage when you're shopping and unpacking shopping?
- How do you use date labels when shopping/unpacking shopping? For what reasons??
- How do you use storage guidance when shopping/unpacking shopping? For what reasons?
- Does it depend on the product? If so, how and why?
- How does use of packaging information vary across different types of purchase (habitual/spontaneous/considered etcetc)
- What other factors drive storage decisions, and how do these link to on-pack dates and storage guidance?
- What factors drive disposal decisions, and how do these link to on-pack dates and storage guidance?
- How are dates and storage guidance used in conjunction with one another to make storage/disposal decisions?

10 mins	<p>Part 4 – Discussion of understanding of date labels and storage guidance</p> <p><i>Without looking at any particular products, what can you recall about date labels and storage guidance on food packaging? What do those labels tell you? What do you look for?</i></p> <ul style="list-style-type: none"> • Does participant distinguish between different dates, and do they define them correctly? If not, what do they get wrong? <p>Use questionnaire Q11 if you have it. Probe further on 'working definition' elements:</p> <ul style="list-style-type: none"> • Do you use date labels and storage guidance strictly or as a guide with your own judgement? Ignore completely and use own judgement? • How do you interpret use by/best before? Different foods? • Are you very cautious e.g. leave a buffer? [Is this done intentionally (or because of uncertainty)? If so why?]. • What if storage guidance conflicted with your own way of doing things? • Different for different foods? • Different in different <i>contexts</i>? – Particularly probe around guests, children (if they have). • Do you use them inconsistently? • Do you trust them? Does it depend on the product/brand/supermarket? • <i>What, if anything, are you particularly confused/uncertain about?</i> <p>Scope for improvement/change</p> <ul style="list-style-type: none"> • If we wanted to help people to use date labels and storage guidance better (e.g. so that they avoid wasting money by throwing out good food), can you think of anything that could be done? • How could packaging be improved to help people avoid throwing food away? • What else could be done other than improvements to packaging? 	<p>Aim: Gauge understanding of different date labels and 'working' definitions of dates and storage guidance</p>
2 mins	<ul style="list-style-type: none"> • Give them a chance to ask any questions • Ask for permission to recontact (just in case) • Thank and close 	

Appendix 8 Online survey questionnaire

Introductory text

Thank you for agreeing to complete this 15 minute survey about food and food labelling. We have used some photographs of different types of food in some questions as examples – please note that these pictures are just illustrations – please answer the questions as though they were about the product or brand you normally buy.

Section 1: About you

[Section 1: all single code, all respondents to answer]

1. Are you
Male
Female
2. How old are you?
18-24
25-34
35-44
45-54
55-64
65+
3. Which best describes you?
Working full time (30 or more hours per week)
Working part time (less than 30 hours per week)
Retired
Unemployed
Child carer
Student
Other
4.
4A. "Including yourself, how many people in total live in your household?"
4B. "How many people aged 18 years old or older live in your household?"
4C. "How many people aged 17 years old or younger live in your household?"

Follow-up option (instore/online) if respondents choose one of the supermarket brands where this is indicated.

5. Where do you normally do your main food shop? Please select the one where you do the most shopping.
Single code
Aldi
Asda(**instore/online**)
The Cooperative (Co-op) (**instore/online**)
Lidl
Marks & Spencer (**instore/online**)
Morrison's (**instore/online**)
Safeway (**instore/online**)
Sainsbury's (**instore/online**)
Somerfield (**instore/online**)
Tesco (**instore/online**)
Waitrose (**instore/online (Ocado)**)
Market
Local shops (e.g. local butcher, greengrocer)
Other

6. Which statement best describes you?
 I have responsibility for all or most of the shopping
 I have responsibility for about half of the shopping
 I have responsibility for less than half of the shopping
 I don't have responsibility for any of the shopping
7. Which statement best describes you?
 I have responsibility for all or most of the cooking
 I have responsibility for about half of the cooking
 I have responsibility for less than half of the cooking
 I don't have responsibility for any of the cooking

Sample split into three groups (Group A = 650; Group B = 650; Group C = 700). Groups remain the same throughout (i.e. respondents in group A for Section 2 stay in Group A for rest of survey)

Section 2: Date labels

This section is about the date labels found on food packaging

In this first question, you will see a series of six date labels. We will ask you a few questions about each label.

One image is shown at a time. Questions a., b. and c. are asked for each image, with a rotation of the starting image from 1 to 6.

Group A

Group A

	Image	Category						
1	<div><div>Best Before</div><div>26 AUG 2010</div></div>	Best before						
2	<table><tr><td>Display Until</td><td>Best Before</td></tr><tr><td>26AUG2010</td><td>28AUG2010</td></tr><tr><td colspan="2">21:19 L1</td></tr></table>	Display Until	Best Before	26AUG2010	28AUG2010	21:19 L1		Best Before/Display until Lot code
Display Until	Best Before							
26AUG2010	28AUG2010							
21:19 L1								
3	<table><tr><td>DISPLAY UNTIL</td><td rowspan="2">L3321</td></tr><tr><td>24 AUG 2010</td></tr></table>	DISPLAY UNTIL	L3321	24 AUG 2010	Display until Lot code			
DISPLAY UNTIL	L3321							
24 AUG 2010								
4	<table><tr><td>DISPLAY UNTIL</td></tr><tr><td>28 AUGUST 2010</td></tr><tr><td>USE BY END</td></tr><tr><td>30 AUGUST 2010</td></tr></table>	DISPLAY UNTIL	28 AUGUST 2010	USE BY END	30 AUGUST 2010	Display until/Use by end		
DISPLAY UNTIL								
28 AUGUST 2010								
USE BY END								
30 AUGUST 2010								

5	<div> USE BY 27 AUG 2010 (2) </div>	Use by/Disguised display until
6	<div> USE BY 26 AUG 2010 (2) L3321 </div>	Use by/Disguised display until Lot code

Group B

	Image	Category
1	<div> Best Before (2) 22 AUG 2010 </div>	Best before/Disguised display until
2	<div> <div>Best Before</div> <div>27AUG2010</div> <div>41129 (2)</div> </div>	Best before/Disguised display until Lot code
3	<div> Display Until 27 AUG 2010 </div>	Display until
4	<div> Display Until 25 AUGUST 2010 Use By 27 AUGUST 2010 </div>	Display until/Use by
5	<div> USE BY 25 AUG 2010 12, 08 </div>	Use by Lot code

6	<div> <div>Display Until 27AUG2010</div> <div>Best Before End 29AUG2010</div> </div>	Display until/Best before end
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Group C

Group C

	Image	Category						
1	<table><tr><td>BEST BEFORE</td></tr><tr><td>27 AUG 2010</td></tr><tr><td>L76831</td></tr></table>	BEST BEFORE	27 AUG 2010	L76831	Best before Lot code			
BEST BEFORE								
27 AUG 2010								
L76831								
2	<table><tr><td>BEST BEFORE END</td></tr><tr><td>28AUG2010</td></tr></table>	BEST BEFORE END	28AUG2010	Best before end				
BEST BEFORE END								
28AUG2010								
3	<table><tr><td>Display Until</td></tr><tr><td>24AUG2010</td></tr><tr><td>Best Before</td></tr><tr><td>26AUG2010</td></tr></table>	Display Until	24AUG2010	Best Before	26AUG2010	Display until/Best before		
Display Until								
24AUG2010								
Best Before								
26AUG2010								
4	<table><tr><td>Display Until</td><td>Use By</td></tr><tr><td>24 AUGUST 2010</td><td>26 AUGUST 2010</td></tr><tr><td colspan="2">L6112</td></tr></table>	Display Until	Use By	24 AUGUST 2010	26 AUGUST 2010	L6112		Display until/Use by Lot code
Display Until	Use By							
24 AUGUST 2010	26 AUGUST 2010							
L6112								
5	<table><tr><td>Use By</td></tr><tr><td>26 AUG 2010</td></tr></table>	Use By	26 AUG 2010	Use by				
Use By								
26 AUG 2010								

6	<div> <div>Use By End</div> <div>23 AUG 2010</div> </div>	Use by end
---	---	------------

B1a. What information is shown in this label?

Tick all the options that apply.

- The last day on which the food is at its highest quality
- The last day on which the food is safe to eat
- The day the food must be sold by
- None of these
- Not sure
- Don't know

B1b. Have you seen this type of label before?

Single code

- Yes
- No
- Don't know

B1c. How easy or difficult do you find it to understand this label?

Single code

- Very easy
- Quite easy
- Neither easy nor difficult
- Quite difficult
- Very difficult
- Don't know

One image shown at a time. Question is asked for each image. Image label is shown above each image and the starting image is rotated from 1 to 8.

B2. Which of the following best describes when you would be happy to eat this product? (Assume it has not been frozen.)

Single code

- I would eat it up until the day before the date on the label
- I would eat it up until the date on the label
- I would eat it the day after the date if it looked and smelt ok
- I would eat it a couple of days after the date if it looked and smelt ok
- I would eat it any time after the date if it looked and smelt ok
- I do not pay attention to date labels for this type of food
- Not applicable – I don't eat this type of food
- Don't know

Group A		
		Category
1		Cheddar cheese (i) Use by
2		Fresh chicken breast fillets Use by end of
3		Yoghurt (i) Best before
4		Bread rolls Best before end

5		<p>Cheddar cheese (ii) Best before end of</p>
6		<p>Milk Use by end</p>
7		<p>Yoghurt (ii) Use by</p>
8		<p>Fresh potatoes Display until</p>

Group B		
	IMAGE	Category
1		Cheddar cheese (i) Use by end of
2		Fresh chicken breast fillets Use by end
3		Yoghurt (i) Best before end of
4		Bread rolls Best before

5		<p>Cheddar cheese (ii) Best before</p>
6		<p>Milk Use by</p>
7		<p>Yoghurt (ii) Use by end</p>
8		<p>Fresh potatoes Best before end</p>

Group C		
	IMAGE	Category
1.		Cheddar cheese (i) Use by end
2.		Fresh chicken breast fillets Use by
3.		Yoghurt (i) Best before end
4.		Bread rolls Best before end of

5.		<p>Cheddar cheese (ii) Best before end</p>
6.		<p>Milk Use by end of</p>
7.		<p>Yoghurt (ii) Use by end of</p>
8.		<p>Fresh potatoes Best before</p>

One food type to be shown at a time. Question to be asked for each type.

B3a. Please indicate on the scale below how you make decisions about when to eat or throw away the following foods.

Single code.

- I rely entirely on the date given on the pack
- I rely mostly on the date given on the pack
- I rely on a mixture of the date and my own judgement
- I rely mostly on my own judgement
- I rely entirely on my own judgement and never look at the date
- Don't know
- I never buy this

Group A

- i. Cheddar cheese
- ii. Fresh chicken breast fillet
- iii. Bread rolls
- iv. Milk
- v. Fresh potatoes
- vi. Yoghurt

Group B

- i. Yoghurt
- ii. Fresh potatoes
- iii. Milk
- iv. Bread rolls
- v. Fresh chicken breast fillet
- vi. Cheddar cheese

Group C

- i. Bread rolls
- ii. Yoghurt
- iii. Cheddar cheese
- iv. Fresh potatoes
- v. Fresh chicken breast fillet
- vi. Milk

B3b. Some retailers are thinking about removing date labels (e.g. 'best before' and 'display until') from fresh produce such as carrots, apples and potatoes. How comfortable or uncomfortable would you be buying fresh fruit and vegetables if they did not have a date label?

Single code.

- Very comfortable
- Quite comfortable
- Neither comfortable nor uncomfortable
- Quite uncomfortable
- Very uncomfortable
- Don't know
- I never buy fresh fruit and vegetables

B4a. All these labels show the date after which the product should not be eaten. Which, if any, do you think is the most useful? Please select one.

Single code.

All images shown simultaneously, with checkbox by each one, plus options for 'No preference' and 'Don't know' at the end.

All respondents see the same images

Use By

27 AUG 2010

Use By End

27 AUG 2010

Display Until
25 AUG 2010

Use By
27 AUG 2010

DISPLAY UNTIL

25 AUG 2010

USE BY END

27 AUG 2010

USE BY

27 AUG 2010

(2)

B4b. All these labels show the date at which the product is at its best quality. Which, if any, do you think is the most useful? Please select one.

All images shown simultaneously, with checkbox by each one, plus options for 'No preference' and 'Don't know' at the end.

All respondents see the same images.

Best Before

28 AUG 2010

BEST BEFORE END

28 AUG 2010

Display Until

26 AUG 2010

Best Before

28 AUG 2010

Best Before

(2) 28 AUG 2010

Section 3: Usage and storage guidance

This section is about some of the different types of guidance found on food packs.

You will now see some pictures of foods with different usage guidance (for example 'once opened, use within 3 days') on the packaging. Hover over the image to zoom in, and click on the image to select.

C1. Looking at the storage guidance for these products, which, if any, of would you be most likely to buy?

- **One image shown at a time. Question asked of each image.**
- **Note: each image contains more than one product, with a checkbox under each of the products contained in the image (e.g. on the one for sliced ham, there is one checkbox under each of the two packets).**
- **For each image, options for 'No preference' and 'Not applicable – I never buy this' and 'I don't look at this information for this product' are included.**
- **Image label is included above each image**

Item	Image
Sliced ham Consume within 2/3 days	
Milk Consume within 2/3/4 days of opening	
Pasta sauce Refrigerate after opening for up to five/seven days	

Both Q2a & Q2b to be asked of the following image:

Group A

Snowflake logo



Group B

Snowflake logo with 'suitable for home freezing' text



Suitable for
home freezing

Group C

Snowflake logo



C2a. Have you seen this logo before on food packs?

- Yes
- No
- Don't know

C2b. What do you think this logo means?

Single code

- Freeze on day of purchase
- Keep refrigerated
- This product can be frozen
- This product must be frozen
- This is a frozen meal
- None of these
- Not sure
- Don't know

C2c. Both of these logos show that a product is suitable for freezing. Which do you think is most useful?
Both images to be shown simultaneously to all respondents. Checkbox under each image plus:

Both images to be shown simultaneously, with checkbox by each one, plus options for 'No preference' and 'Don't know' at the end.



Snowflake logo/Snowflake logo with 'suitable for home freezing' text





C3. Please indicate when you would be happy to freeze this product.

Single code





- Only on the day I bought it
- Up until one or two days after I bought it
- Anytime before the date on the label
- Up until one or two days after the date on the label
- Anytime up until it started to look or smell off
- Not applicable: I never freeze this kind of food
- Not applicable: I never buy this
- Don't know

One image to be shown at a time. Rotate starting image from 1 to 4.





Group A

	Category
	<p>Bacon Freeze on day of purchase Use by</p>
	<p>Bread rolls Best before/Freeze before</p>
	<p>Ready meals Use by/Freeze by Snowflake logo with 'Suitable for home freezing' text</p>
	<p>Fresh chicken breast fillets Use by Freeze on day of purchase</p>

Group B

	Category
	<p>Bacon Use by/Freeze by</p>
	<p>Bread rolls Best before Freeze on day of purchase</p>
	<p>Ready meals Use by Snowflake logo with 'Suitable for home freezing' text</p>
	<p>Fresh chicken breast fillets Use by/Freeze by</p>

Group C

	Category
	<p>Bacon Use by Freeze on day of purchase</p>
	<p>Bread rolls Best before/Freeze before</p>
	<p>Ready meals Use by/Freeze by Snowflake logo with 'Suitable for home freezing' text</p>
	<p>Fresh chicken breast fillets Use by Freeze on day of purchase</p>

C4a. Which, if any, of the following best describe how you decide where to store foods when you get home and unpack your shopping? Select up to two.

- I read the storage guidance on the pack
- I go on where things were stored in the shop
- I use my own judgement
- I go on where I usually store similar products
- I do what I've always done
- Other (specify)
- None of these
- Not applicable (I don't do the shopping)
- Don't know

C4b. The following is a list of possible places where tips and guidance could be provided on how to store food to keep it at its best. For each option, please say how useful you think it would be.

Very useful Quite useful Neither useful nor not useful Not very useful Not at all useful Don't know

- On the supermarket/product website
- On display boards in the supermarket
- On the food packaging
- In leaflets in the supermarket
- On the supermarket shelf
- In the in-store magazine
- On TV adverts

Section 4: Shopping and cooking habits

In this final section, please tell us a little bit about your shopping and cooking habits.

D1. When food shopping, how often do you choose the product with the longest date?

Single code

- Always
- Most of the time
- Some of the time
- Rarely
- Never
- Don't know
- Not applicable – I don't do the food shopping

D2. How important or unimportant are each of the following when you are choosing what food to buy?

Very important Quite important Neither important nor unimportant Not very important Not at all important N/A

- How easy to prepare/cook
- How long until it goes off
- Price
- Quality
- Freshness
- Taste

D3. How often do you:

Always Most of the time Some of the time Rarely Never Don't know

Keep an eye on food dates so you know what needs eating when?

Use leftovers for lunch/other meals?

Make use of fruit and vegetables that may be past their best in dishes like soups, smoothies and casseroles

Seek out recipes to help use up food that is approaching the date on the label?

Freeze home made meals, leftovers or food that you've bought but not used?

Check what you have at home before you go food shopping (e.g. in the cupboards, fridge, or freezer)

Plan what you are going to buy before you go shopping?

D4. To what extent do you:

Always Most of the time Some of the time Rarely Never Don't know

Use guidance on food packaging to tell you how long to keep food that you have opened but not finished (e.g. 'Once opened, use within 3 days)?

Use guidance on food packaging to tell you where to store food (e.g. in the fridge, freezer, a cool dark place)

Make sure you follow storage instructions on food packaging?

When food shopping, check the pack for how food should be stored at home?

D5. Thinking about the different types of food waste that may occur, how much uneaten food, overall, would you say you generally end up throwing away?

Single code

Quite a lot

A reasonable amount

Some

A small amount

Hardly any

None

Don't know

Thank you for taking the time to complete this survey.

END

Appendix 9 WRAP 'Food Date Labelling' Omnibus Study

Which date label information do you look at on food products?

Base: All Respondents

Table 1

	Total	Gender		Government Office Region												Marital Status			Children	
		Male	Female	Scot	Wales	NI	NE	NW	Yorks	West Mid	East Mid	East	London	SE	SW	Single	Married Cohabiting	Widow Divorced Separated	Yes	No
unweighted base	1784	631	1153	166	89	33	95	189	143	164	143	167	202	249	144	448	1059	277	528	1256
weighted base	1703	614	1089	144	73	27	69	177	155	147	164	157	210	242	138	403	1048	252	505	1198
Use by	319	310	609	61	38	15	30	98	92	100	89	89	108	135	64	202	563	154	270	649
	54%	50%	56%	42%	52%	56%	43%	55%	53%	68%	54%	57%	51%	56%	46%	50%	54%	61%	53%	54%
Best before	601	216	385	41	24	10	27	75	44	39	47	62	86	91	55	150	359	92	199	402
	35%	35%	35%	28%	33%	37%	39%	42%	28%	27%	29%	39%	41%	38%	40%	37%	34%	37%	39%	34%
Display until	163	62	101	8	5	4	7	19	10	14	14	13	28	28	13	38	92	33	47	116
	10%	10%	9%	6%	7%	15%	10%	11%	6%	10%	9%	8%	13%	12%	9%	9%	9%	13%	9%	10%
Sell by	493	192	301	45	19	10	22	58	48	35	52	48	58	65	33	123	296	74	136	357
	29%	31%	28%	31%	26%	37%	32%	33%	31%	24%	32%	31%	28%	27%	24%	31%	28%	29%	27%	30%
Never look at them	147	61	86	17	6	2	4	9	13	11	15	12	19	21	18	44	86	17	35	112
	9%	10%	8%	12%	8%	7%	6%	5%	8%	7%	9%	8%	9%	9%	13%	11%	8%	7%	7%	9%

Key:  Notably higher  Notably lower  of interest

If the 'use by' date on a food product was yesterday's date, which is most appropriate;

Base: All Respondents

Table 2

	Total	Gender		Government Office Region												Marital Status			Children	
		Male	Female	Scot	Wales	NI	NE	NW	Yorks	West Mid	East Mid	East	London	SE	SW	Single	Married Cohabiting	Widow Divorced Separated	Yes	No
	1703	614	1089	144	73	27	63	177	155	147	164	157	210	242	138	403	1048	252	505	1198
The food product could be unsafe to eat and should be thrown away	252	87	165	19	13	5	12	27	29	29	23	25	27	26	17	56	156	40	74	178
	15%	14%	15%	13%	18%	13%	17%	15%	19%	20%	14%	16%	13%	11%	12%	14%	15%	16%	15%	15%
The food product could be unsafe to eat but I would test it / use own judgement	422	152	270	35	18	8	13	37	38	31	54	36	53	61	38	106	249	67	126	296
	25%	25%	25%	24%	25%	30%	19%	21%	25%	21%	33%	23%	25%	25%	28%	26%	24%	27%	25%	25%
The food product is past its best but not necessarily unsafe to eat	202	85	117	18	12	3	11	21	21	19	12	15	25	26	19	51	129	22	51	151
	12%	14%	11%	13%	16%	11%	16%	12%	14%	13%	7%	10%	12%	11%	14%	13%	12%	9%	10%	13%
It depends on the food (type)	824	289	535	72	30	11	33	92	66	67	75	80	105	129	64	190	512	122	253	571
	48%	47%	49%	50%	41%	41%	48%	52%	43%	46%	46%	51%	50%	53%	46%	47%	49%	48%	50%	48%
Don't know	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other	3	1	2	0	0	0	0	0	1	1	0	1	0	0	0	0	2	1	1	2
	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%

If the 'best before' date on a food product was yesterday's date, do you think;

Base: All Respondents

Table 3

	Total	Gender		Government Office Region												Marital Status			Children	
		Male	Female	Scot	Wales	NI	NE	NW	Yorks	West Mid	East Mid	East	London	SE	SW	Single	Married Cohabiting	Widow Divorced Separated	Yes	No
	1703	614	1089	144	73	27	63	177	155	147	164	157	210	242	138	403	1048	252	505	1198
The food product could be unsafe to eat and should be thrown away	177	58	119	16	12	3	8	13	19	20	16	16	21	23	10	51	104	22	43	128
	10%	9%	11%	11%	16%	11%	12%	7%	12%	14%	10%	10%	10%	10%	7%	13%	10%	9%	10%	11%
The food product could be unsafe to eat but I would test it / use own judgement	618	235	383	53	25	7	23	78	53	44	67	66	71	76	49	133	331	34	180	438
	36%	38%	35%	41%	34%	26%	33%	44%	34%	30%	41%	42%	34%	31%	36%	33%	37%	37%	36%	37%
The food product is past its best but not necessarily unsafe to eat	322	133	189	21	18	14	12	36	35	28	23	28	38	40	29	79	193	50	88	234
	19%	22%	17%	15%	25%	52%	17%	20%	23%	19%	14%	18%	18%	17%	21%	20%	18%	20%	17%	20%
It depends on the food (type)	581	188	393	48	17	3	26	50	47	53	58	47	79	103	50	139	357	85	185	396
	34%	31%	36%	33%	23%	11%	38%	28%	30%	36%	35%	30%	38%	43%	36%	34%	34%	34%	37%	33%
Don't know	5	0	5	0	1	0	0	0	1	2	0	0	1	0	0	1	3	1	3	2
	0%	0%	0%	0%	1%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%

If the 'display until' date on a food product was yesterday's date, do you think;

Base: All Respondents

Table 4

	Total	Gender		Government Office Region												Marital Status			Children	
		Male	Female	Scot	Wales	NI	NE	NW	Yorks	West Mid	East Mid	East	London	SE	SW	Single	Married Cohabiting	Widow Divorced Separated	Yes	No
	1703	614	1089	144	73	27	63	177	155	147	164	157	210	242	138	403	1048	252	505	1198
The food product could be unsafe to eat and should be thrown away	151	56	95	14	13	0	7	16	9	19	9	10	22	21	11	37	90	24	38	113
	9%	9%	9%	10%	18%	0%	10%	9%	6%	13%	5%	6%	10%	9%	8%	9%	9%	10%	8%	9%
The food product could be unsafe to eat but I would test it / use own judgement	562	208	354	51	20	8	24	60	54	44	53	64	62	82	40	130	358	74	163	399
	33%	34%	33%	35%	27%	30%	35%	34%	35%	30%	32%	41%	30%	34%	29%	32%	34%	29%	32%	33%
The food product is past its best but not necessarily unsafe to eat	229	93	136	14	11	7	7	27	24	20	20	18	37	26	18	47	149	33	73	156
	13%	15%	12%	10%	15%	26%	10%	15%	15%	14%	12%	11%	18%	11%	13%	12%	14%	13%	14%	13%
It depends on the food (type)	440	146	294	34	18	8	17	43	35	36	46	34	56	72	41	110	272	58	141	299
	26%	24%	27%	24%	25%	30%	25%	24%	23%	24%	28%	22%	27%	30%	30%	27%	26%	23%	28%	25%
It depends on the use by date	218	74	144	20	8	3	11	20	23	23	19	21	19	30	21	53	118	47	60	158
	13%	12%	13%	14%	11%	11%	16%	11%	15%	16%	12%	13%	9%	12%	15%	13%	11%	19%	12%	13%
It depends on the best before date	82	29	53	11	2	1	2	10	8	4	15	7	9	7	6	22	48	12	22	60
	5%	5%	5%	8%	3%	4%	3%	6%	5%	3%	9%	4%	4%	3%	4%	5%	5%	5%	4%	5%
Don't know	21	8	13	0	1	0	1	1	2	1	2	3	5	4	1	4	13	4	8	13
	1%	1%	1%	0%	1%	0%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%	2%	2%	1%

If the 'sell by' date on a food product was yesterday's date, do you think;

Base: All Respondents

Table 5

	Total	Gender		Government Office Region												Marital Status			Children	
		Male	Female	Scot	Wales	NI	NE	NW	Yorks	West Mid	East Mid	East	London	SE	SW	Single	Married Cohabiting	Widow Divorced Separated	Yes	No
	1703	614	1089	144	73	27	63	177	155	147	164	157	210	242	138	403	1048	252	505	1198
The food product could be unsafe to eat and should be thrown away	164	54	110	13	13	0	8	13	12	21	18	14	22	20	10	42	101	21	37	127
	10%	9%	10%	9%	18%	0%	12%	7%	8%	14%	11%	9%	10%	8%	7%	10%	10%	8%	7%	11%
The food product is past its best but not necessarily unsafe to eat	434	198	236	43	18	12	19	56	58	40	46	44	60	55	37	104	321	63	151	343
	29%	32%	27%	34%	25%	44%	28%	32%	37%	27%	28%	28%	29%	23%	27%	26%	31%	27%	30%	29%
It depends on the food (type)	648	233	415	52	29	8	25	63	48	54	66	57	78	103	65	168	387	33	201	447
	38%	38%	38%	36%	40%	30%	36%	36%	31%	37%	40%	36%	37%	43%	47%	42%	37%	37%	40%	37%
It depends on the use by date	293	93	200	22	9	6	13	29	27	26	22	29	37	51	22	66	176	51	83	210
	17%	15%	18%	15%	12%	22%	13%	16%	17%	18%	13%	18%	18%	21%	16%	16%	17%	20%	16%	18%
It depends on the best before date	95	35	60	8	3	1	3	15	9	5	12	12	11	13	3	22	57	16	29	66
	6%	6%	6%	6%	4%	4%	4%	8%	6%	3%	7%	8%	5%	5%	2%	5%	5%	6%	6%	6%
Don't know	9	1	8	0	1	0	1	1	1	1	0	1	2	0	1	1	6	2	4	5
	1%	0%	1%	0%	1%	0%	1%	1%	1%	1%	0%	1%	1%	0%	1%	0%	1%	1%	1%	0%

How confident are you that you understand what the different food dates mean?

Base: All Respondents

Table 6

		Gender		Government Office Region												Marital Status			Children		
		Total	Male	Female	Scot	Wales	NI	NE	NW	Yorks	West Mid	East Mid	East	London	SE	SW	Single	Married Cohabiting	Widow Divorced Separated	Yes	No
Very confident		1703	614	1089	144	73	27	69	177	155	147	164	157	210	242	138	403	1048	252	505	1198
		626	225	401	58	27	10	22	70	48	51	62	63	76	88	51	144	388	34	186	440
		37%	37%	37%	40%	37%	37%	32%	40%	31%	35%	38%	40%	36%	36%	37%	36%	37%	37%	37%	37%
Fairly confident		1003	363	640	77	43	14	41	101	104	87	95	90	126	144	81	238	612	153	293	710
		59%	59%	59%	53%	59%	52%	59%	57%	67%	59%	58%	57%	60%	60%	59%	59%	58%	61%	58%	59%
		73	25	48	9	3	3	6	6	3	8	7	4	8	10	6	21	47	5	26	47
Not at all confident		4%	4%	4%	6%	4%	11%	9%	3%	2%	5%	4%	3%	4%	4%	4%	5%	4%	2%	5%	4%
		1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1
		0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Don't know																					

Do you understand food dates better now than you did this time last year?

Base: All Respondents

Table 7

		Gender		Government Office Region												Marital Status			Children		
		Total	Male	Female	Scot	Wales	NI	NE	N/W	Yorks	West Mid	East Mid	East	London	SE	S/W	Single	Married Cohabiting	Widow Divorced Separated	Yes	No
Yes		1703	614	1089	144	73	27	69	177	155	147	164	157	210	242	138	403	1048	252	505	1198
		421	150	271	33	20	6	22	54	45	38	36	36	52	54	25	107	250	64	122	299
		25%	24%	25%	23%	27%	22%	32%	31%	29%	26%	22%	23%	25%	22%	18%	27%	24%	25%	24%	25%
No, I still don't understand them		91	30	61	9	4	2	6	6	4	10	10	4	13	11	12	20	62	9	30	61
		5%	5%	6%	6%	5%	7%	9%	3%	3%	7%	6%	3%	6%	5%	9%	5%	6%	4%	6%	5%
		1191	434	757	102	49	19	41	117	106	99	118	117	145	177	101	276	736	179	353	838
No, I understood what they meant before		70%	71%	70%	71%	67%	70%	59%	66%	68%	67%	72%	75%	69%	73%	73%	68%	70%	71%	70%	70%

Would you usually look at the food date labels when deciding whether or not to buy the following items?

Table 10

Base: All Respondents

	Fresh fruit and vegetables e.g. apples, potatoes	Fresh meat (e.g. chicken breasts)	Fresh fish (e.g. salmon fillets)	Chilled ready meals e.g. cottage pie or pizza	Milk	Yoghurt	Hard cheese e.g. cheddar	Frozen meat (e.g. leg of lamb)	Frozen fish (e.g. cod fillets)	Frozen vegetables e.g. chips, peas	Bakery products (e.g. bread, rolls)	Eggs	Tins (e.g. beans, tuna)	Snacks (e.g. biscuits, crisps)
weighted base	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703
1 - Always	745	1223	1150	820	1201	1165	922	555	586	481	1064	1003	394	537
	44%	72%	68%	48%	71%	68%	54%	33%	34%	28%	62%	59%	23%	32%
2 - Often	145	141	94	144	161	135	133	109	105	93	214	213	76	94
	9%	8%	6%	8%	9%	8%	8%	6%	6%	5%	13%	13%	4%	6%
3 - Sometimes	168	74	44	172	86	136	199	148	151	181	126	120	160	246
	10%	4%	3%	10%	5%	8%	12%	9%	9%	11%	7%	7%	9%	14%
4 - Rarely	126	24	19	64	45	50	178	224	203	281	72	60	375	265
	7%	1%	1%	4%	3%	3%	10%	13%	12%	17%	4%	4%	22%	16%
5 - Never	420	91	97	106	162	77	197	293	303	484	164	187	665	480
	25%	5%	6%	6%	10%	5%	12%	17%	18%	28%	10%	11%	39%	28%
Not applicable / Don't buy this food	99	150	299	397	48	140	74	374	355	183	63	120	33	81
	6%	9%	18%	23%	3%	8%	4%	22%	21%	11%	4%	7%	2%	5%
Mean	2.58	1.47	1.45	1.85	1.67	1.55	2.14	2.69	2.65	3.13	1.82	1.87	3.5	3.04
Standard Deviation	1.703	1.068	1.105	1.289	1.289	1.097	1.481	1.646	1.657	1.664	1.329	1.381	1.598	1.652

**Waste & Resources
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