

Exploring food attitudes and behaviours in the UK: Findings from the Food and You Survey 2012

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Exploring food attitudes and behaviours in the UK: Findings from the Food and You Survey 2012

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Executive summary and Chapter 7: Looking ahead

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Executive summary

This report presents findings from Wave 2 of the Food and You survey, commissioned by the Food Standards Agency (FSA or the Agency). Food and You examines attitudes, reported behaviour and knowledge relating to food safety issues. It provides data on food purchasing, storage, preparation, consumption and factors that may affect these, such as eating habits, influences on where people choose to eat out and experiences of food poisoning. The survey also examines views about wider food safety issues, including levels of awareness, knowledge and concerns about new food production technologies such as genetic modification and irradiation.

The first wave of the survey was carried out in 2010, and this second wave provides data from 2012. This wave also saw the development of an index of recommended practice for food safety which has been used to explore socio-demographic differences in reported food safety practices in more depth.

The survey consisted of 3,231 interviews among a representative sample of adults aged 16 and over (with no upper age limit) across the UK.

This summary brings together key findings from across the report (Chapters 2 -6). It does not cover the concluding chapter because this contains no findings but instead discusses, from the perspective of the Agency's Social Science Research Unit, the contribution of Food and You to the wider evidence base on food safety practices, and considerations for the future.

Food safety in the home (Chapters 3 and 4)

The extent to which reported food safety practices followed Agency recommendations varied substantially between socio-demographic groups and also differed depending on the type of practice.

Using a composite measure of domestic food safety practices, an index of recommended practice (RP) was developed (see Chapter 4) in order to identify which socio-demographic groups *overall* were less likely to report behaviour in line with recommended practice. Fourteen questions from the survey were included, based on Agency recommended practices which, if not followed, were most likely to increase the chances of contracting a foodborne illness. The index ranged from all reported practices being in line with Agency guidance (0), to all practices not being in line with Agency guidance (10). The following groups were found to be more likely to be in the upper band of the index (score of 5 or more) and therefore **less** likely to report food safety practices in line with Agency guidance:

■ Men

Male respondents were more likely than female respondents to be in the upper band of the index (their odds of being in the upper band were 54% higher than the odds for women¹).

■ Older respondents aged 45 and over, and in particular respondents aged 75 or older.

There were no significant differences between respondents aged 35-44 (the reference category²) and younger age groups. However, respondents aged 45 and over were more likely to be in the upper band of the index. Respondents aged 75 or older were particularly likely to be in the upper band of the index (their odds of being in the upper band were 150% higher than the odds for respondents aged 35-44). A similar but less pronounced pattern was found for respondents aged 45-54, 55-64 and 65-74 (their odds of being in the upper band of the index were between 72% and 80% higher than the odds for respondents aged 35-44).

■ Respondents in England and Scotland.

Compared to respondents in Northern Ireland, respondents in England and Scotland were more likely to be in the upper band of the index (the odds of being in the upper band were 90% higher for respondents living in England and 50% higher for respondent living in Scotland). There were no significant differences between respondents in Northern Ireland and respondents in Wales.

Looking at individual food safety practices (Chapter 3), the survey found that the majority of reported **cleaning** practices were in line with Agency recommended practice; 96% of respondents stated they wiped down kitchen surfaces at least once a week and 85% reported always washing their hands after handling raw meat, poultry or fish.

Reported practices for **cooking and re-heating** were also largely in line with recommended practice; 79% of respondents reported always cooking food until it was steaming hot and most respondents reported never eating chicken or turkey (90%), or burgers or sausages (80%), if they were pink or had pink/red juices. Only a small proportion (8%) of respondents reported that they would re-heat food more than once.

Most respondents reported practices of fridge storage that were in line with Agency advice on preventing **cross-contamination**; three-quarters (77%) of respondents reported keeping food in certain parts of the fridge and, of these, three-quarters (76%) reported that the reason for this was to stop cross-contamination. Fewer respondents reported practices

¹ The odds refer to the odds ratio of the logistic regression used for this analysis. They indicate the size of the effect, that is, by how much a variable increases or decreases the likelihood of being in the upper band of the index compared with the reference category. For more explanation, see Chapter 4 and Section 8.3.

² The reference category is the category against which other categories were compared – see Chapter 4 for further detail.

in line with Agency advice never to wash raw meat and poultry (32%). However, this figure has increased compared to Wave 1 (26%).

Reported practices for **chilling** were the least likely to be in line with recommended practice; 42% of respondents reported that they check their fridge temperature and just over half (53%) reported that the fridge temperature should be between 0-5°C (this has increased compared to 46% in Wave 1).

Around two-thirds of respondents stated that **use by dates** were the best indicator of whether food was safe to eat (64%) and they always checked the use by date before preparing or cooking food (67%). Three-quarters (74%) of respondents reported that they would not eat leftover food more than two days after it had been cooked.

Eating outside of the home (Chapter 5)

Compared to Wave 1, there has been an increase in the proportion of respondents reporting having eaten out in the previous week (75% compared to 69% in Wave 1) and having eaten out six times or more (12% compared to 8% in Wave 1). However, asked about changes made in the last 6 months for financial reasons (see Chapter 2), a larger proportion of respondents in Wave 2 reported eating at home (24%) and eating fewer takeaways (21%) compared to Wave 1 (16% and 17% respectively). These apparently contradictory findings may result from the different time periods the questions relate to. This is discussed in more detail in Chapter 5.

Half (48%) of all respondents felt that food was less safe when eating out compared to eating at home, whilst 42% thought there was no difference and only 6% thought the reverse was true. When asked about what was important when deciding where to eat out, most respondents said cleanliness and hygiene (69%) followed by good service (63%) and price (54%). A quarter (26%) of respondents said that a good a hygiene rating or score was important when deciding where to eat out.

The majority of respondents (72%) reported being aware of standards of hygiene when eating out. When asked how they know about the hygiene standards of places they eat out at or buy food from, respondents were most likely to say the general appearance of the premises (63%). Just under a quarter (23%) of respondents said they know about hygiene standards from a hygiene certificate (a decrease compared to 28% in Wave 1) and 13% said a hygiene sticker (an increase compared to 9% in Wave 1).

A third (34%) of respondents in England, Wales and Northern Ireland reported having seen a Food Hygiene Rating Scheme (FHRS) certificate and/or sticker before, whilst 44% of respondents in Scotland reported having seen a Food Hygiene Information Scheme (FHIS) certificate and/or sticker before. Respondents were most likely to have seen this certificate and/or sticker on the window or door of an establishment (between 74% and 92% for the FHRS, 88% for the FHIS). Ten per cent of respondents reported having used

a hygiene scheme such as the FHRS/FHIS when deciding whether to eat in an establishment and 92% of these respondents found the scheme helpful.

Food poisoning and attitudes towards food safety and production (Chapter 6)

Almost three-quarters (72%) of all respondents reported being concerned about food poisoning whilst two-fifths (37%) reported having experienced food poisoning in the past. A third (30%) of these respondents reported going to see a doctor or going to hospital as a result of their most recent food poisoning. Asked what they did as a result of experiencing food poisoning, a third (32%) reported having stopped eating at certain food establishments.

Three quarters (74%) of respondents agreed with the statement 'I am unlikely to get food poisoning from food prepared in my own home' whilst a quarter (24%) of respondents agreed with the statement 'It's just bad luck if you get food poisoning'.

A quarter (24%) of respondents reported that they often worried about whether the food they had was safe to eat and 69% reported that they were fairly or very concerned about food hygiene when eating out. Respondents who reported being concerned about food hygiene when eating out were more likely to report having used a food hygiene standards scheme. For example, 30% of respondents who said they were concerned about food hygiene when eating out reported using a hygiene certificate compared to 19% of respondents who did not say they were concerned.

Respondents expressed more concern about the food safety of imported products, and in particular imported meat; the proportion who said they were fairly or very concerned about this was 62% compared to 33% for meat produced in the UK.

Asked about awareness of new food technologies used in food production, respondents reported being most aware of genetic modification (80%) with 34% of these respondents reporting they felt knowledgeable about the use of this technology. Awareness was lower for animal cloning (64%), irradiation (34%) and nanotechnology (20%). The issue most respondents reported feeling uneasy about was animal cloning (66%) followed by genetic modification (52%), irradiation (51%) and nanotechnology (34%).

1. Introduction

This report presents findings from Wave 2 of the Food and You survey, commissioned by the Food Standards Agency (FSA or the Agency). Much of the Agency's work with the public is concerned with informing and influencing the ways in which food is purchased, stored, prepared and consumed. Food and You provides data about the prevalence of different attitudes, reported behaviour and knowledge on these topics.

The first wave of the survey was carried out in 2010, and this second wave builds on and extends previous findings. While it is possible to observe some differences between the two waves, trends cannot be reliably detected without further waves of data.

This report provides a descriptive overview of the key findings from Wave 2, which consisted of 3,231 interviews from a representative sample of adults aged 16 and over (with no upper age limit) across the UK.

1.1 Background and objectives

1.1.1 Role of the FSA

The FSA was created in 2000 as a non-ministerial government department governed by a Board. The Agency was set up to:

“Protect public health from risks which may arise in connection with the consumption of food, and otherwise to protect the interests of consumers in relation to food”

The Food Standards Agency has a strategy to 2015 which sets out their approach to ensure the general public can have trust and confidence in the food they buy and eat. The six outcomes the FSA aims to deliver are:

- Foods produced or sold in the UK are safe to eat;
- Imported food is safe to eat;
- Food producers and caterers give priority to consumer interests in relation to food;
- Consumers have the information and understanding they need to make informed choices about where and what they eat;
- Regulation is effective, risk-based and proportionate, is clear about the responsibilities of food business operators, and protects consumers and their interests from fraud and other risks; and
- Enforcement is effective, consistent, risk-based and proportionate and is focused on improving public health.

In providing guidance on food safety to consumers, the Agency aims to minimise the risk of food poisoning. Advice to the general population centres on four aspects of food

hygiene: cleaning, cooking, cross-contamination and chilling (collectively known as the '4 Cs'), with advice given on each aspect. Guidance is also given on the use of date labels (such as 'use by' and 'best before' dates) and storage instructions on foods to help ensure the safety of food eaten at home.

1.1.2 The Food and You survey

In 2008, the FSA's Social Science Research Committee (SSRC)³ was asked to review the Agency's Consumer Attitudes Survey (CAS)⁴, which had run for eight waves from the FSA's inception in 2000⁵. The SSRC recommended that a new rigorous regular survey was needed to provide evidence underpinning the FSA's policies⁶. The review of the CAS noted that using a random location quota sample risked introducing unquantifiable bias into the sample and recommended that a future survey should adopt a random probability approach. Given the large number of variables influencing attitudes and behaviour a minimum target sample of 2,500 achieved interviews was suggested. The review noted that the relationship between knowledge, attitudes, behaviour and individual characteristics is complex. Even with precisely worded questions, responses will vary according to knowledge and understanding of the subject matter. As such, it was recommended that the questionnaire be developed with input from an Advisory Group with representatives from the SSRC, and new questions piloted.

In 2009, the FSA commissioned a consortium comprising TNS BMRB, the Policy Studies Institute (PSI) and the University of Westminster to carry out the first wave of Food and You, whose main aim was to collect quantitative information as a baseline on the UK public's attitudes, beliefs and reported behaviour towards food issues (such as food safety and healthy eating). This provided an extensive evidence base to support policy making at the FSA and across other relevant government departments.

Wave 1 of the Food and You survey was carried out in 2010. A report on the findings, and methodological details, are available on the FSA website⁷. Results from Wave 1 of the survey were used to determine the theme of the 2012 FSA Food Safety week⁸.

Wave 1 of the Food and You survey contained questions covering both healthy eating and food safety, and the findings were reported together. However, during Wave 1 of the survey, responsibility for nutrition policy (healthy eating) transferred in England and Wales to the Department of Health (DH) and the Welsh Assembly Government respectively.

³ The SSRC is an independent Scientific Advisory Committee set up to provide advice and challenge to the Agency on social science matters; further information can be found at: <http://ssrc.food.gov/>

⁴ Further information on CAS can be found at: <http://www.food.gov.uk/science/socsci/surveys/foodsafety-nutrition-diet/>

⁵ The SSRC's full discussion paper can be found at: <http://www.food.gov.uk/multimedia/pdfs/ssrc0822v1.pdf>

⁶ <http://food.gov.uk/multimedia/pdfs/ssrc0822v1.pdf>
⁷ http://www.foodbase.org.uk//admintools/reportdocuments/641-1-1079_Food_and_You_Report_Main_Report_FINAL.pdf

⁸ <http://www.food.gov.uk/news-updates/campaigns/germwatch/>

Nutrition policy in Scotland and Northern Ireland remains the responsibility of the Agency. Wave 2 of the survey, therefore, focussed solely on food safety issues for England and Wales but also included an additional question module on healthy eating for Scotland and Northern Ireland. This report covers the UK wide food safety questions only; separate reports will be published for Scotland and Northern Ireland that include analysis of the healthy eating module.

The objectives for the second wave of the Food and You survey were to collect quantitative information to enable the Agency to:

- Explore public understanding of, and engagement with, the Agency's aim of improving food safety;
- Assess public attitudes to new developments, such as emerging food technologies;
- Assess knowledge of, and response to, messages and interventions aimed at raising awareness and changing behaviour;
- Identify specific target groups for future interventions (e.g. those most at risk or those among whom FSA policies and initiatives are likely to have the greatest impact);
- Monitor changes over time (compared with data from Wave 1 or from other sources) in attitudes and behaviour; and
- Broaden the evidence base and develop indicators to assess progress in fulfilling the Agency's strategic plans, aims and targets.

1.2 Methodology

In this section, an overview of the survey methodology is presented; detailed information can be found in a separate technical report⁹.

1.2.1 The Survey

The survey sample was a stratified¹⁰ clustered¹¹ random probability sample of private households in the UK. The Postcode Address File (PAF)¹² was used as a sampling frame and in each eligible household one adult aged 16 and over (with no upper age limit) was selected for interview. Where there was more than one household, or more than one adult in a household at an address, a random selection procedure was used to select the respondent. Weighting was applied at the analysis stage, to ensure the weighted sample was representative of the UK as a whole.

⁹ http://www.foodbase.org.uk//admintools/reportdocuments/805-1-1459_Wave_2_Technical_Report.pdf

¹⁰ The sample was stratified by Government Office Region (GOR), the percentage of heads of households in a non-manual occupation (NS-SEC groups 1-3), the percentage of households with no car and population density (persons per hectare)

¹¹ The addresses selected to participate in the survey were clustered within postcode sectors to provide manageable interviewer workloads.

¹² The PAF lists all known UK postcodes and addresses and is the sampling frame commonly used in general population surveys.

The survey comprised 3,231 interviews with adults across the UK, carried out face-to-face in respondents' homes. The samples in Scotland and Northern Ireland were boosted (increasing the sample to around 500 in each country) to enable more detailed analysis at a country level. The final results were weighted back to ensure that the countries where the sample was boosted were not over-represented. The sample profile is shown in the table below.

Table 1.1 Weighted and unweighted sample profile

	Unweighted (n)	Weighted (n)
Total	3,231	3,231
England & Wales	2,220	2,866
Scotland	507	274
Northern Ireland	504	91

The fieldwork for the survey took place between March and August 2012. Interviews took, on average, 45 minutes to complete. A response rate of 54% was achieved; this was slightly higher than Wave 1 where the response rate was 52%.

1.2.2 Questionnaire development

Before the main survey was carried out, an extensive development phase was undertaken to ensure that Wave 2 collected information of interest to the FSA, and that it produced the highest quality data possible. The development began with TNS BMRB, the FSA and the Advisory Group reviewing the Wave 1 questionnaire to determine which questions should be kept for Wave 2. The review stage also identified new areas of interest which were to be considered for inclusion in the survey. Following this review, a questionnaire was developed by the TNS BMRB/PSI research consortium based on the policy priorities for Wave 2.

There were three main stages of questionnaire testing:

- cognitive testing;
- omnibus testing; and
- a pilot survey.

A separate report has been produced which covers the questionnaire testing in detail¹³.

¹³ [http://www.foodbase.org.uk//admintools/reportdocuments/805-1-1458 Food and You W2 Question testing report 01 10 2012 FINAL.pdf](http://www.foodbase.org.uk//admintools/reportdocuments/805-1-1458%20Food%20and%20You%20W2%20Question%20testing%20report%2001%2010%202012%20FINAL.pdf)

1.3 About this report

1.3.1 Self-reported behaviours

Interviews as a data collection method cannot capture people's actual behaviour. What respondents say in interviews about what they do is necessarily *reported* behaviour. Here self-reported behaviour is used as a proxy. Although for the sake of smoother reading, much of the report refers to behaviour, attitudes or knowledge without repeating that it is reported, the fact that it is not actual behaviour must none the less always be borne in mind.

At the questionnaire development stage, the risk of social desirability bias was high i.e. respondents tended to answer questions based on what they thought they ought to say, rather than reflecting what they actually do, know or think. In particular, there were a number of topics in the questionnaire, for which respondents might be particularly reluctant to report behaviour which goes against 'best practice' (for example, not washing their hands before cooking or preparing food). As for Wave 1 of the survey, the questionnaire was carefully designed to mitigate this by asking questions about behaviour in specific time periods (e.g. 'yesterday' rather than 'usually'), and by ensuring that behaviours asked about included neutral items as well as recommended and not recommended practices.

1.3.2 Wave-on-wave analysis

As a result of the change in the remit of the FSA, the focus of the survey content was changed between Wave 1 and Wave 2. However, to minimise order effects (which can affect the way in which questions are answered) attempts were made to keep the structure of the questionnaire as similar as possible. Despite this, the removal of the healthy eating questions introduced unavoidable differences between the two waves of the survey. As the context in which survey questions are asked is known to influence the way respondents reply we cannot rule out the possibility that differences in responses between waves may have been partly or wholly because of the removal of the 'healthy eating' context.

Where questions have remained consistent with Wave 1, statistical testing has been undertaken to determine whether results have significantly changed over the last two years. It is important, however, to exercise caution in the interpretation of apparent differences. As there are only two data points it is not possible to tell whether statistically significant differences indicate a trend. A third wave of data collection would allow greater confidence in identifying trends.

In Wave 1 of the survey, in order to cover additional topics without over-burdening respondents, three sections of the questionnaire (eating arrangements, eating out and shopping patterns) were each asked of a random third of respondents. In Wave 2, all of the survey questions were asked of all respondents. Whilst in general comparisons can still be made between questions in Wave 1 which were asked of a third of the sample and the questions in Wave 2, the smaller sample sizes in Wave 1 mean that for significant

differences to be observed the differences have to be larger.

1.3.3 Analysis carried out

Throughout the report, bivariate analysis has generally been used to look at how attitudes and reported behaviours differ for key demographic groups (e.g. gender and age). Such analysis can be carried out quickly allowing a large number of cross-tables to be produced, and it displays differences in a clear manner which is easily understood by readers. A drawback of bivariate analysis, however, is that other factors that may be the underlying cause of the differences seen between two groups cannot be controlled for.

Whilst the majority of statistical testing has used bivariate analysis, there is one topic area where multivariate analysis has been used to explore whether variation in the likelihood of following the FSA's recommended practice (RP) for food safety differs by certain demographic factors (see Chapter 4). In order to do this, a composite variable was created, based on answers given to a range of questions, to give each respondent a score on an index of RP for food safety. Respondents were grouped into three categories: lower band (0-1), mid band (3-4) and upper band (5-10) and multivariate analysis of the composite variable was carried out to analyse the significance and contribution of a number of demographic factors in predicting whether or not a respondent engaged in behaviours that were not in line with RP.

A technique known as logistic multivariate regression modelling was used to determine which demographic characteristics were most associated with being in the upper band of the index of RP for food safety. See Chapter 4 and Appendix 8.1 for further details.

1.3.4 Reporting conventions

Only those differences found to be statistically significant at the 95% level are reported. This means that we can be 95% confident that an observed difference was not due to chance¹⁴.

Percentages may not add to 100% as a result of rounding.

1.3.5 Further use of the findings and data

The survey collected a wide range of data and this report does not cover everything. In particular, only selected differences by socio-demographic groups are reported. Data tables are available online¹⁵ and full data are available on the UK Data Archive¹⁶ for further

¹⁴ If we kept on drawing samples of the populations of the same size and composition, there would be an observed difference in 95% of those samples.

¹⁵ http://www.foodbase.org.uk//admintools/reportdocuments/805-1-1454_Food_and_You_FINAL_weighted_tables_v1.pdf

¹⁶ <http://www.data-archive.ac.uk/>

analysis.

1.3.6 Structure of the report

The report is divided into six chapters:

- Chapter 2 presents findings about eating, cooking and shopping habits, providing background information and context for the rest of the report;
- Chapter 3 presents findings about the extent to which respondents were aware of and report practices that are in line with government advice on food safety, including practices relating to the '4 Cs' (cleaning, cross-contamination, chilling and cooking), use of leftovers and date labels and attitudes to food safety;
- Chapter 4 draws together differences in reported food safety practices between different groups of the population through the introduction and analysis of an index of recommended practice (RP) for food safety;
- Chapter 5 focuses on reported eating outside of the home, covering the type of establishments where people eat out, the frequency of eating out and the decision making process which goes into deciding where to eat out. Particular focus is placed on the use of Food Hygiene Rating Schemes (FHRS) and Food Hygiene Information Schemes (FHIS);
- Chapter 6 explores experience of food poisoning and concern about food safety and food production. The chapter also looks at whether concern has affected reported attitudes or behaviour.

2. Setting the scene: eating, cooking and shopping

To provide some context for the report, this chapter examines eating, cooking and shopping behaviours and changes in behaviour for financial reasons.

Summary

Eating and cooking at home

- Over the previous week, on average (mean) respondents ate their main evening meal at home on six days, their breakfast on five days and their lunch on four days.
- Around two-thirds (69%) of respondents in Wave 2 reported they cooked and prepared food for themselves at least five times a week.
- The majority of respondents (71%) did not have any specific dietary requirement, an increase compared with Wave 1 (63%). Only 9% of respondents stated they avoided certain foods for medical reasons, and 9% reported they followed a weight-reducing diet. Both these figures have slightly decreased compared with Wave 1.

Shopping for food

- Frequency of shopping was unchanged compared with Wave 1. Food shopping behaviour was dominated by a reliance on buying in-store (as distinct from on-line) at large supermarkets, with nine in ten saying that this was their main food source. However, most (71%) combined a main shop at a large supermarket with top-up shops at local or independent stores. A small proportion received a home delivery from the supermarket (9%) and fewer still (3%) relied mainly or solely on local or independent stores.

Changes in food purchase and consumption for financial reasons

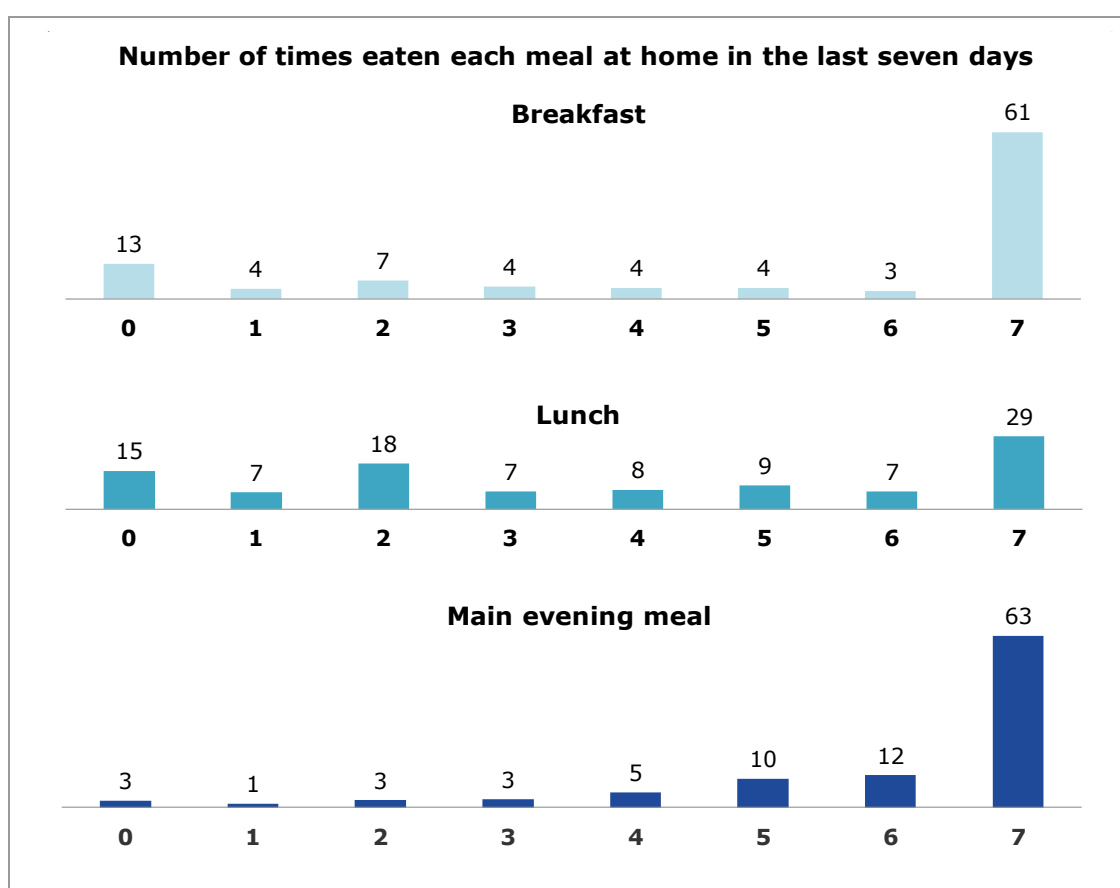
- Compared with Wave 1, a greater number of respondents in Wave 2 reported making changes in buying and consumption of food for financial reasons. For example, there was an increase in the number of respondents reporting they bought items on special offer more (37% compared with 29%), ate at home more (24% compared with 16%) and ate fewer takeaways (21% compared with 17%). There was little evidence of people prolonging leftovers or using food past its use by date because of financial constraints.

2.1 Eating and cooking at home

2.1.1 Frequency of eating at home

Respondents were asked how often, in the last seven days, they had eaten breakfast, lunch or their main evening meal at home. As shown in Figure 2.1, the majority of respondents ate all of their breakfast and main evening meals at home. The picture was somewhat more mixed for lunch with 29% having eaten it at home seven days out of the last seven, and 40% having eaten it at home twice or less. Taking the average (mean) number of times respondents ate each of these three meals at home, the highest figure was for the main evening meal (6 times) followed by breakfast (5.1 times) and lunch (3.9 times).

Figure 2.1 Frequency of eating at home (Wave 2)

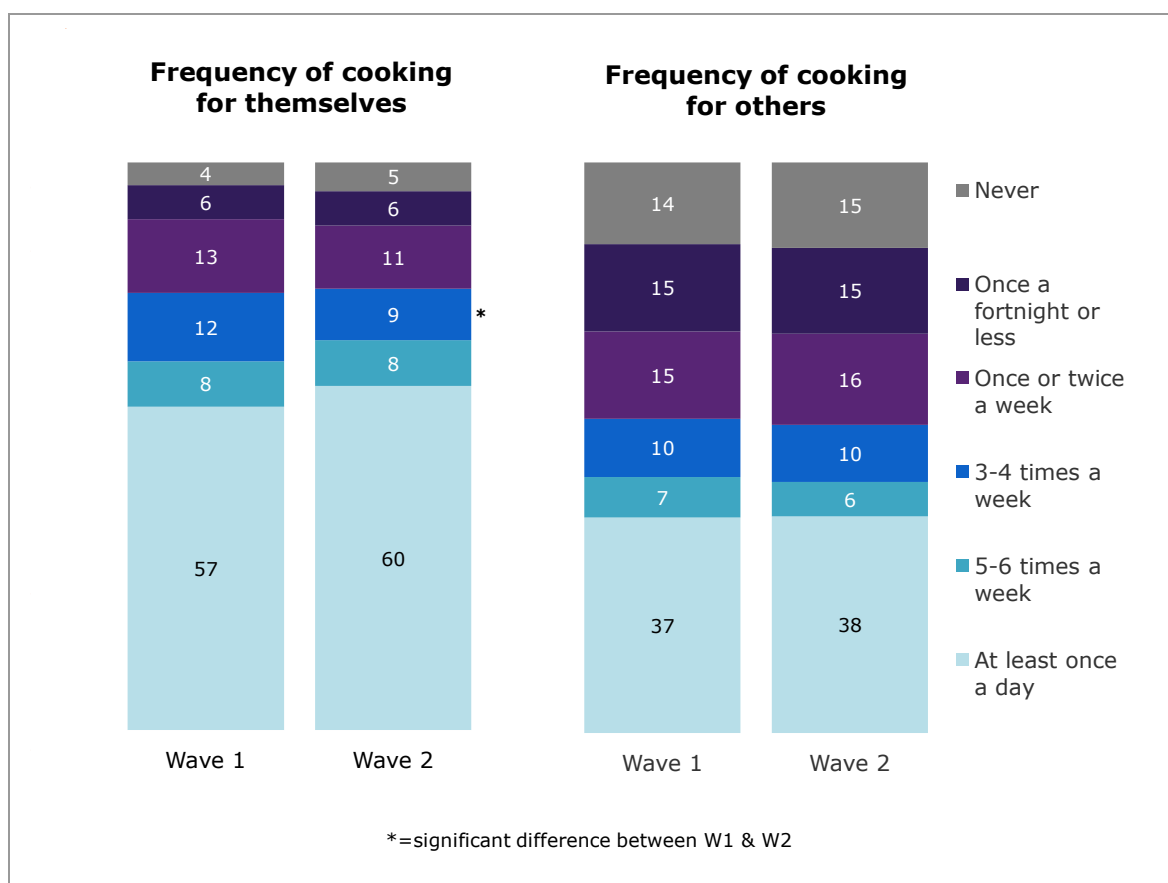


Source: Q2_7A/B/C In the last 7 days, that is since last ..., on how many days out of that seven did you eat BREAKFAST/LUNCH/MAIN EVENING MEAL AT HOME?
Base: All respondents - Wave 2 (3231)

2.1.2 Cooking patterns

The frequency distribution of home-prepared food remained unchanged from Wave 1, with 69% of respondents reporting that they cooked and prepared food for themselves, and 44% reporting that they prepared food for others, at least five times a week (Figure 2.2).

Figure 2.2 Frequency of cooking meals for self and others (Wave 1 and Wave 2)



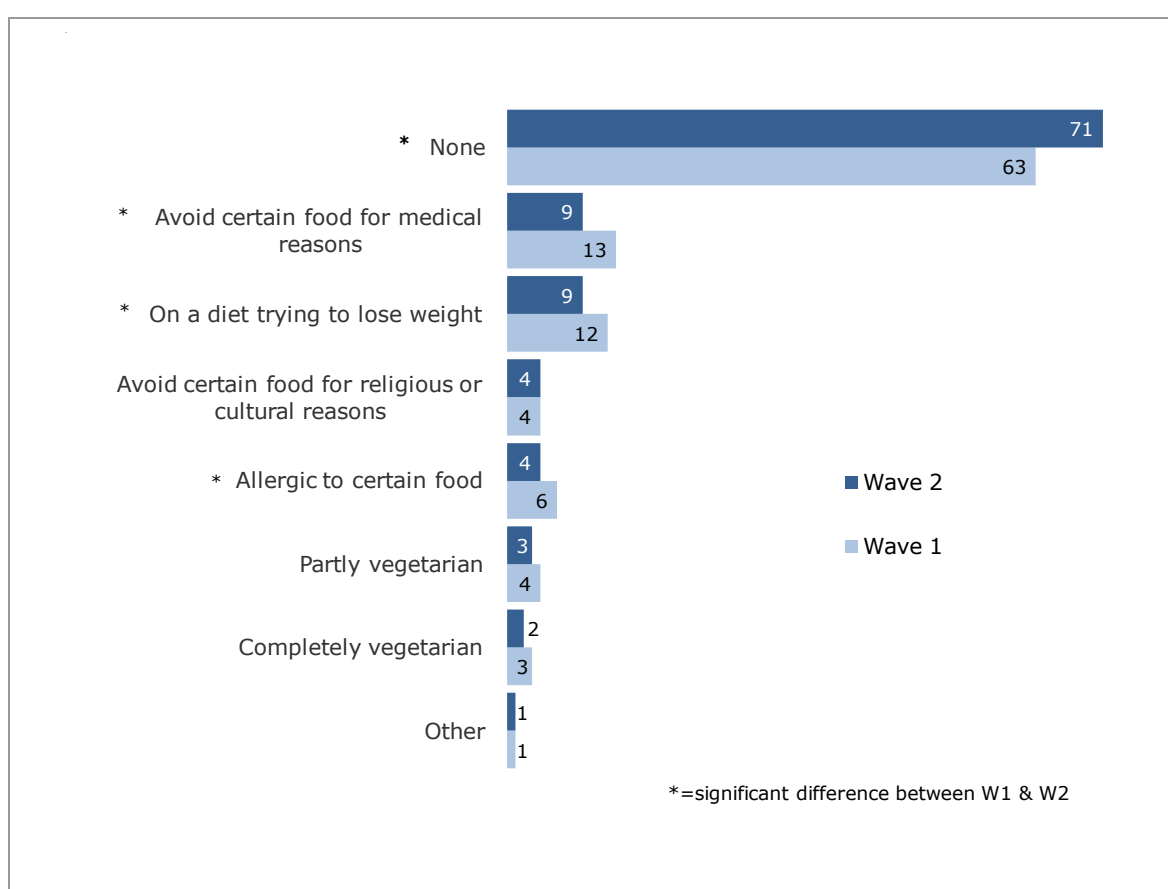
Source: Q2_3 How often do you cook or prepare food for yourself? & Q2.4 How often do you cook or prepare food for others?

Base: All respondents - Wave 1 (3163); Wave 2 (3231)

2.1.3 Eating restrictions

The large majority of respondents (71%) did not have any specific dietary requirements. A small percentage avoided certain foods for medical reasons (9%), and followed a weight-reducing diet (9%). Other dietary restrictions/requirements such as being allergic to certain foods, vegetarianism and avoiding certain food for religious or cultural reasons were all mentioned by fewer than 5% of respondents. There were only minor variations on this measure compared with Wave 1, although, overall a higher proportion of respondents in Wave 2 reported that they had no specific dietary requirements (71% compared with 63%) (Figure 2.3).

Figure 2.3 Dietary restrictions (Wave 1 and Wave 2)



Source: Q7.1 Which, if any, of the following applies to you? Please state all that apply.
Base: All respondents - Wave 1 (3163); All respondents - Wave 2 (3231)

2.1.4 Variations in eating and cooking at home among different groups in the population

The frequency of eating at home was found to vary by **gender** with women being more likely than men to report regularly eating meals at home, particularly breakfast (eating an average of 5.6 breakfasts at home in the previous 7 days compared with 5.1 breakfasts)

and lunch (an average of 4.3 lunches at home compared with 3.6). Women were also more likely than men to report preparation of food for themselves (82% compared with 55%) and for others (63% compared with 25%) on a regular basis (at least five times a week).

Age was also a significant factor with older respondents being more likely than younger respondents to eat their meals at home. Again this was particularly the case for breakfast and lunch, with breakfast being eaten at home an average of 4.7 days out of the last week for 16-24s, increasing to 6.5 days out of the last week for the over 60s and lunch eaten at home an average of 3.0 days in the last week among 16-24s, compared with 5.5 days in the last week among the over 60s.

As might be expected, respondents with **children aged under six** were more likely than other types of households to prepare food for others (59% compared with 35%) and respondents **living alone** were more likely than those living with other people to make food for themselves at least once a day (76% compared with 57%).

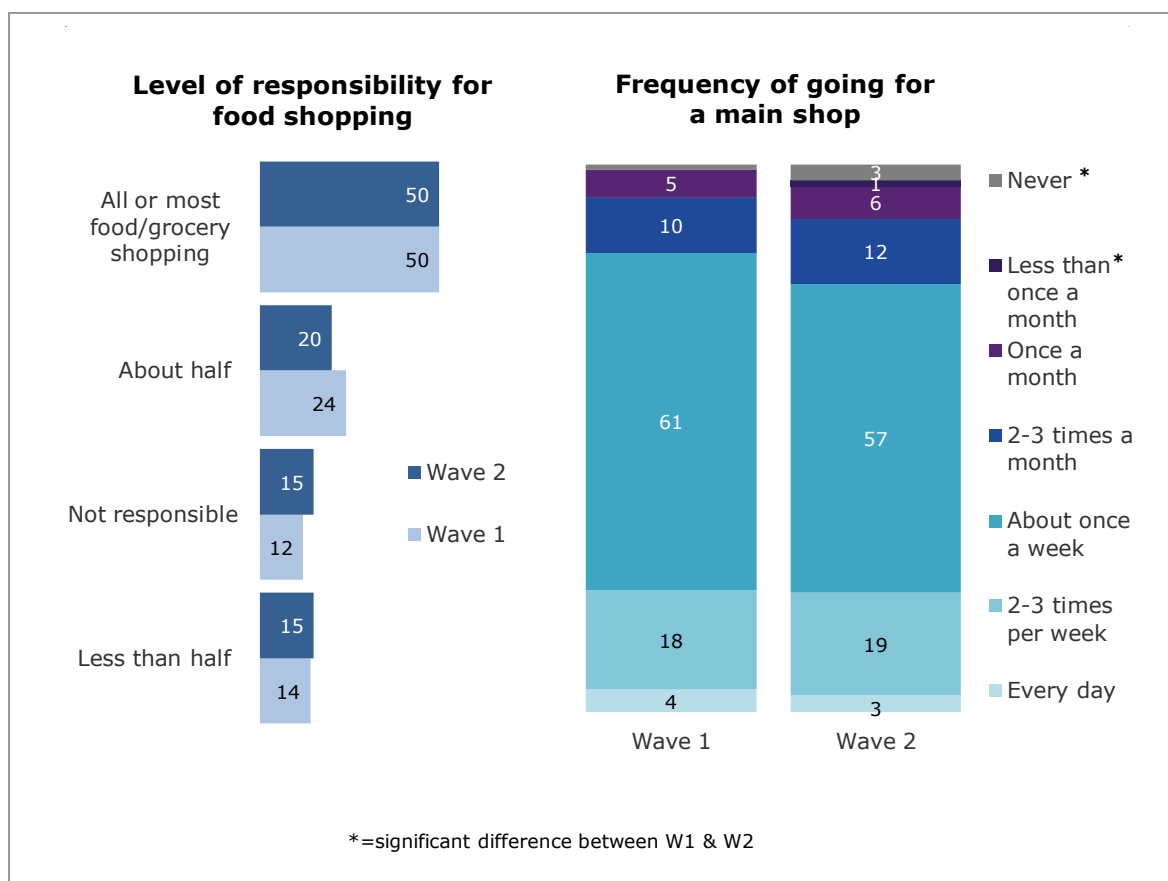
Some variation by **household income** and **working status** was also observed. Respondents with lower incomes (annual household income of less than £10,400) ate lunch more frequently at home (mean of 4.9 meals) compared with respondents with incomes at least £52,000 (mean of 3.2), although there was little difference in the frequency of eating either breakfast or an evening meal at home. Respondents who worked reported the lowest frequency of eating lunch at home (a mean of 3.0 times per week), compared with retired (5.8) and unemployed (4.7) respondents). Breakfast was eaten at home most frequently by retired respondents (6.5 times a week) compared with 5.0 times a week for those in work and 4.7 times a week for the unemployed. There was less variation in the frequency in which dinner was eaten at home.

Finally, respondents from non-White **ethnic groups** were much more likely than White respondents to avoid certain foods for cultural or religious reasons (38% compared with 1%), and to be vegetarian (7% compared with 2%).

2.2 Shopping for food

The majority of respondents (85%) had at least some responsibility for household food shopping, with half (50%) saying they were responsible for all or most of this. 57% of respondents reported that they shopped on a weekly basis. These findings were not significantly different from those reported in Wave 1.

Figure 2.4 Responsibility for and frequency of food shopping (Wave 1 and Wave 2)



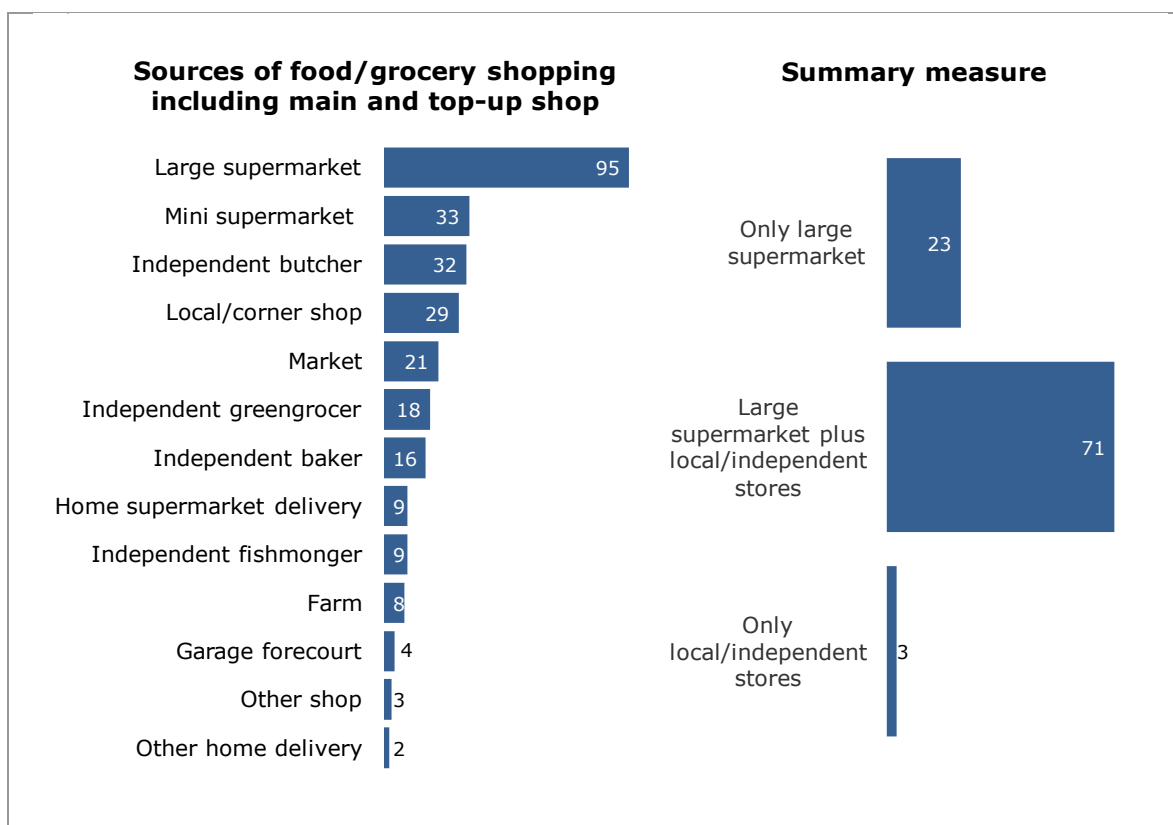
Source: Q3_1 Thinking about food/ grocery shopping, which of these best describes the level of responsibility you have for the shopping in your household? & Q3_7 How often do you (or someone else) do a main shop for your household food shopping?

Base: One third of total sample – Wave 1 (1034); All respondents - Wave 2 (3231)

Food shopping was dominated by a reliance on buying in-store (as distinct from on-line) at large supermarkets (95% used large supermarkets regularly and 88% said this was the household's main food shop). As this question was different in Wave 1 no comparison was possible.

A relatively small proportion of respondents (25%) relied solely on a large supermarket, while 71% combined their main shop at a large supermarket with top-up shops at local or independent stores or markets. A very small proportion (3%) relied solely or mainly on local or independent stores.

Figure 2.5 Where respondents did food shopping (Wave 2)



Source: Q3_3 Where do you/ does your household shop for food?

Base: All respondents - Wave 2 (3231)

2.2.1 Variations in shopping for food among different groups in the population

Clear differences were found by **gender** with women being more likely than men to be responsible for all or most of their food and grocery shopping (70% compared with 29% of men).

There were also variations by **age**, with younger respondents (aged 16-24) much less likely than other age groups to be responsible for any food shopping in the household (14% compared with 48-61% for other age groups).

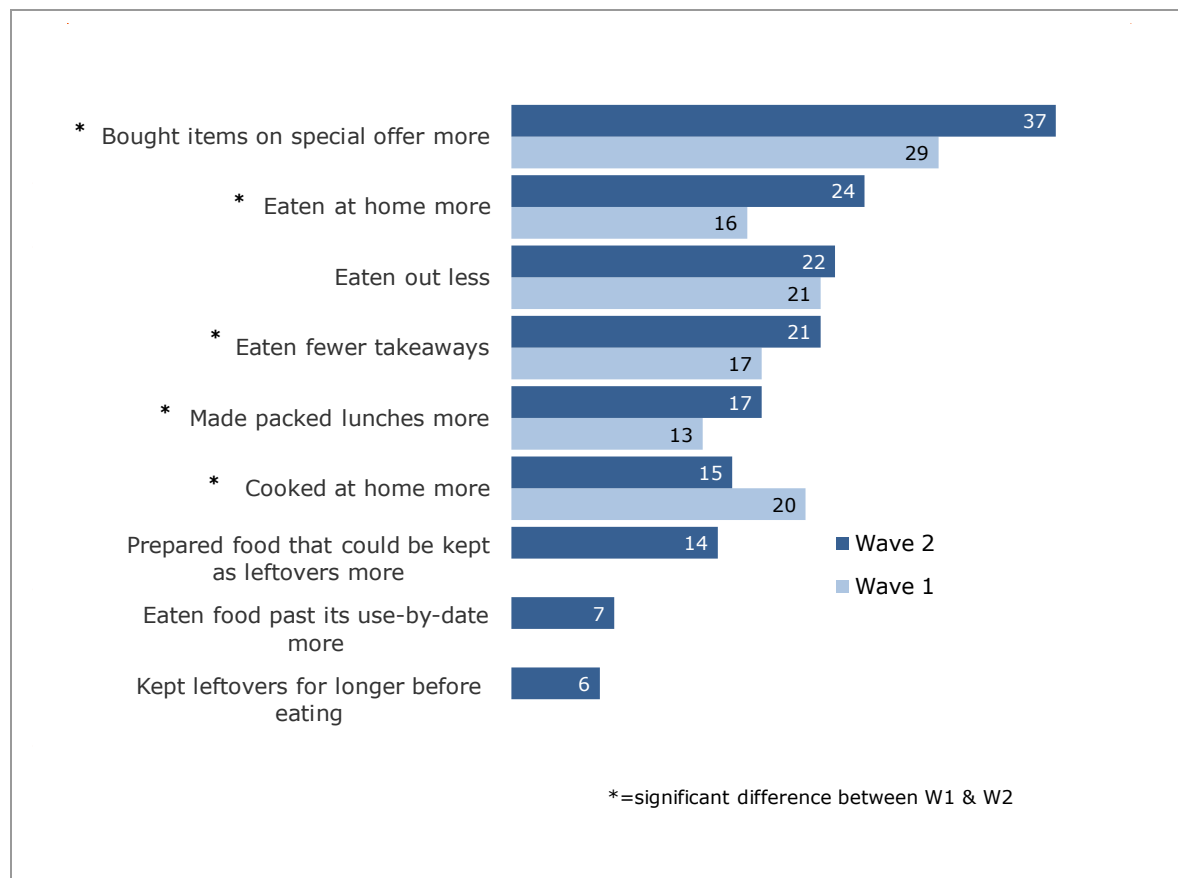
2.3 Changes in buying and eating arrangements for financial reasons

Respondents were asked whether they had made any changes in their eating arrangements for financial reasons. Overall, 60% of respondents in Wave 2 said they had made at least one such change (there was no comparable figure for Wave 1 as a result of changes between waves). On the whole, compared with Wave 1, a greater proportion of

respondents in Wave 2 reported that they had changed their eating arrangements for financial reasons. For example, a greater proportion of respondents in Wave 2 reported that they were buying items on special offer more (37% compared with 29% at Wave 1); eating at home more (24% compared with 16% at Wave 1); reducing takeaway consumption (21% compared with 17% at Wave 1); and increasing preparation of packed lunches at home (17% compared with 13% at Wave 1).

Fourteen per cent of respondents reported that they were more likely to prepare food that could be kept as leftovers, 7% that they were more likely to eat food past its use by date, and 6% that they kept leftovers for longer before eating. These findings suggest that changes in financial circumstances may have implications for consumer food safety. These questions were not included in Wave 1 so wave-on-wave comparisons were not possible.

Figure 2.6 Changes in buying and eating arrangements for financial reasons (Wave 1 and Wave 2)



Source: Q3_13 Have you made any of these changes in the last 6 months for financial reasons?

Base: One third of total sample – Wave 1 (1034); All respondents - Wave 2 (3231)

2.3.1 Variations by population group in changes in buying and eating

Differences were found, perhaps unsurprisingly, by **household income**. Respondents living in households with an income above £52,000 were less likely to report having made at least one change to their eating arrangements for financial reasons in the last six months compared with lower income households (55% compared with 62-65% for respondents living in households with an income below £52,000). Nevertheless, it is interesting to note that over half of households with incomes over £52,000 claimed to have made a change for financial reasons.

3. Food safety in the home

This chapter focuses on reported food safety practices in the home, how these practices compare with FSA recommended practice (RP), and whether there have been any significant changes since Wave 1.

Summary

Food safety practices

Overall, there was substantial variation in the extent to which reported food safety practices in the home reflected Agency recommended practices:

■ Cleaning

- 86% of respondents stated they wiped down kitchen surfaces at least once a day, and 85% reported they changed their tea towels at least once week.
- 85% of respondents reported always washing their hands after handling raw meat, poultry or fish and 81% reported doing so before starting to prepare or cook food.

■ Chilling

- 42% of respondents reported that they check their fridge temperature and half (53%, an increase from 46% in Wave 1) reported that the fridge temperature should be between 0 and 5°C.

■ Cross-contamination

- 61% of respondents (a similar proportion to Wave 1) reported that they stored raw meat on the bottom shelf of the fridge.
- Three-quarters (77%) of respondents reported keeping food in certain parts of the fridge, and of these three-quarters (76%) reported that this was to stop cross contamination.
- A third (32%) of respondents reported they never wash raw meat or poultry, an increase compared with the proportion reporting this in Wave 1 (26%).
- 19% of respondents reported they never wash fish or seafood, which is similar to Wave 1.

■ Cooking

- 79% of respondents reported always cooking food until it is steaming hot.
- The large majority of respondents reported never eating chicken or turkey (90%), or burgers or sausages (80%) if they were pink or had pink/red juices. 81% reported only re-heating food once. Only a very small proportion (8%) said they would re-heat food twice or more.

■ Whether food is safe to eat

- Use by dates tended to be the third or fourth most commonly reported method of telling if meat, fish, milk/yogurt or cheese were safe to eat (reported by between 19% and 28% of respondents depending on food type).
- The most commonly reported methods were 'how it smells' and 'how it looks'. For example around three-quarters of respondents cited using how it smells for milk and yogurt (76%), and 24% cited how it looks for telling if cheese is safe to eat.
- Just under two-thirds (64%) of respondents reported that the use by date was the best indicator of food safety and just over two-thirds (67%) stated they always check the use by date before preparing or cooking food.
- Three-quarters of respondents (74%) reported that they would not eat leftover food more than two days after it had been cooked.
- The most common sources of information on food safety reported were product packaging (36%) and family and friends (35%). Respondents reported that they would look for future sources of information on an Internet search engine (46%) or food website (26%).

3.1 Background

Promoting food safety and protecting public health are central strategic objectives of the Food Standards Agency. Detailed understanding of the attitudes and practices of individuals in relation to food safety and the identification of any groups that are less likely to follow recommended practice helps the FSA to measure progress towards some of its strategic objectives and provide evidence for its strategy to reduce foodborne disease. To this end initiatives have been introduced to improve food safety and hygiene from 'farm to fork'. With reference to food safety in the home, the FSA is committed to "ensuring that consumers better understand how to prepare and store food safely and more consumers follow best practice as a matter of course" (FSA, 2011).

Food preparation in the home is recognised as a critical step in the food chain and the FSA promotes the '4 Cs' principle (Cleanliness, Cooking, Chilling and Cross Contamination) of good food hygiene which is aimed at reducing and preventing cases of domestic foodborne illness. Agency recommendations surrounding the '4Cs' are outlined on the next page and where relevant in the following sections.

Principles of good food hygiene – the 4 C's

Cleanliness

- Prevent harmful bacteria from spreading by observing good personal hygiene.
- Wash hands after using the loo, after handling raw food, and before touching food which is ready to eat.
- Do not handle or prepare food if you have had a stomach upset, have sores or cuts or weeping eye/ear infections.

Cooking

- Cook food thoroughly, especially meat and poultry.
- Make sure it is piping hot before serving.
- If you have to reheat food, make it piping hot all the way through and only reheat it once.

Chilling

- Keep foods at the right temperature to slow down or stop bacterial growth.
- Look at the label on foods to see how they should be stored.
- Store perishable foods at 0-5 degrees centigrade.

Cross Contamination

Cross contamination, or the transfer of bacteria from raw foods to ready-to-eat foods, can happen by:

- Using the same chopping board to prepare raw and ready-to-eat foods.
- Using the same knife for raw and ready-to-eat food.
- Using the same cloth to clean up raw food spills and ready-to-eat food preparation areas.
- Storing raw and ready-to-eat foods together. Always store ready-to-eat foods above raw foods in the refrigerator.

3.2 Domestic food safety practices

While there is now a fairly large academic literature on consumer **perceptions** of food-related risks (see Smeaton et al. 2010 for an overview), there are few studies that have investigated **actual** food safety practices in the home and even fewer conducted in the UK. GreenStreet Berman recently conducted a comprehensive evidence review of this work for the Food Standards Agency (Greenstreet Berman, 2011) and the Social Science Research Committee (2009) also reviewed the evidence, with a specific focus on the domestic food storage and handling practices of older adults. Whilst few studies explored in Greenstreet Berman's review can be directly compared with Food and You, and very few have examined all of the practices reported here either in such detail or so

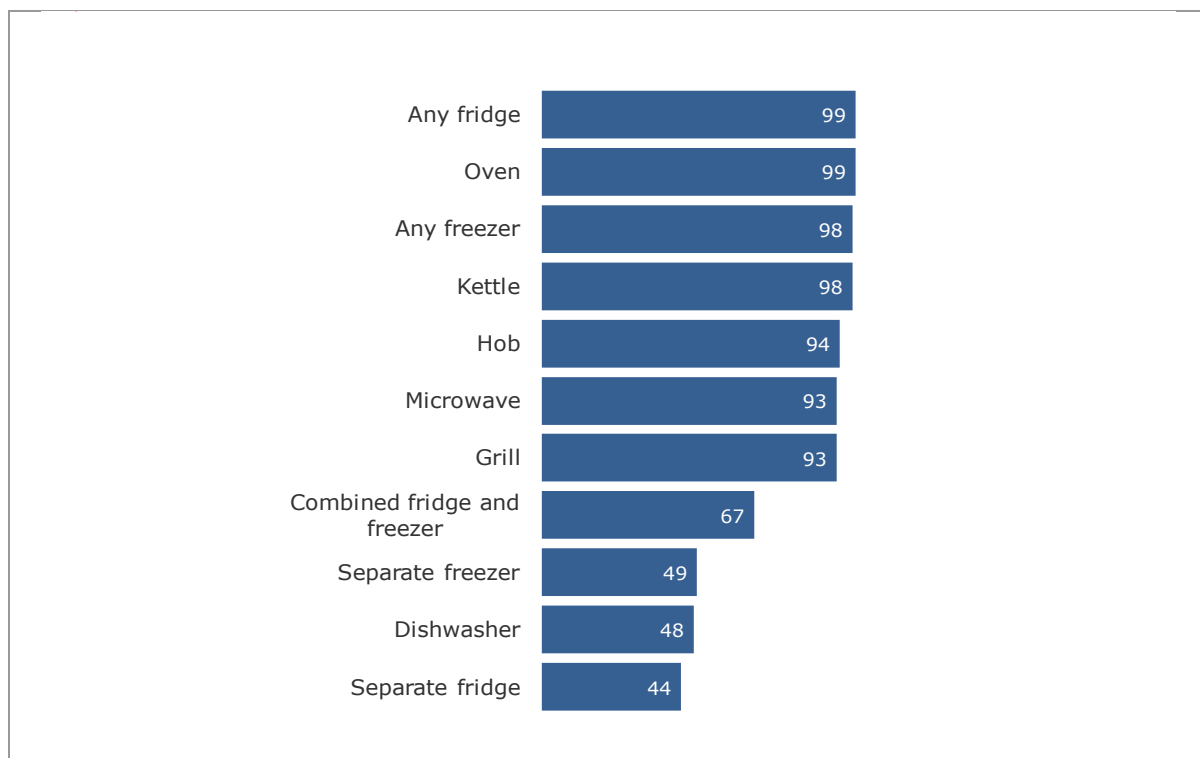
comprehensively, the review identified a consistent pattern of divergence in practice from the recommended '4 Cs' (albeit with some variability by area of practice). Areas with the most divergence were cooking (knowledge of correct temperatures) and chilling practices (knowledge of correct fridge temperature, use of fridge thermometers, thawing) whilst there was less divergence for practices relating to cleaning and cross-contamination (use of chopping boards and other utensils for cooked meat, storage of meat).

Where relevant, the findings from both these reviews are discussed below alongside findings from Food and You. However, as much of this previous work is fragmented, with particular sets of practices examined in isolation, it does not provide comparative findings across all of the food safety practices included in Food and You.

3.2.1 Access to kitchen and appliances

Respondents were asked whether they had access to a separate kitchen ('a separate room in which you can cook') and what kitchen appliances they had in the household (Figure 3.1). The large majority of respondents (93%) had the use of a kitchen, with the most common kitchen appliances being an oven (99%), a fridge (99%), a freezer (98%), and a kettle (98%). Ninety-four per cent had a hob, and 93% a microwave oven. In contrast, just under half (48%) had a dishwasher.

Figure 3.1 Access to appliances (Wave 2)



Source: Q4_8C Which of the following appliances do you have in your household?
Base: All respondents (3231)

3.2.2 Reported practices relating to the '4 Cs' - Cleaning

Wiping surfaces, cleaning sinks and changing tea towels and dishcloths

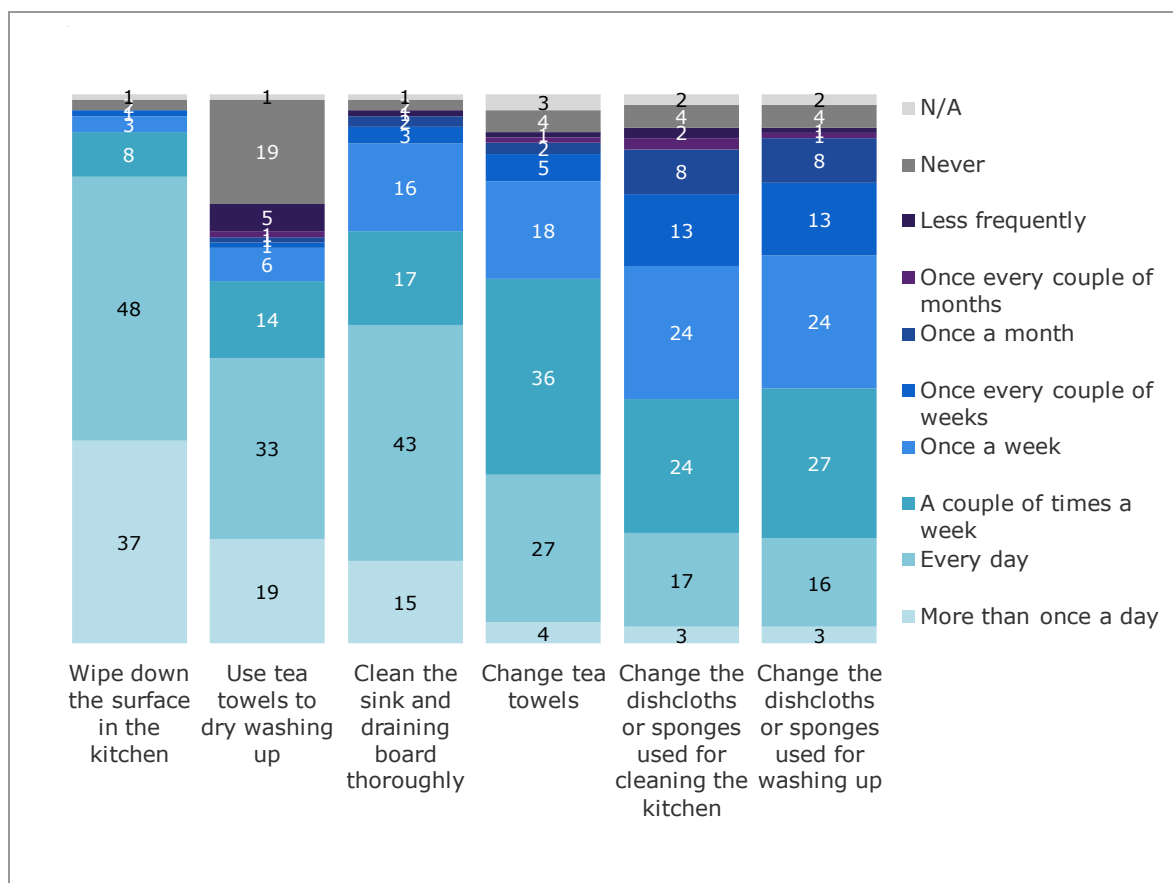
Respondents were asked about the frequency of their cleaning activities and how often they changed cleaning materials. The FSA recommends changing tea towels and dishcloths on a regular basis as they are likely to harbour microbes, worktops should also be cleaned before food preparation and after contact with food.

Results are shown in Figure 3.2. Respondents reported that the cleaning practices they engaged in most frequently (at least once a week) were wiping down their kitchen surfaces (96%) and cleaning their sink and draining board thoroughly (91%). Wiping down kitchen surfaces was also the most frequent daily practice, with 37% carrying this out more than once a day and 86% doing it at least once a day.

70% of respondents said that, at least once a week, they changed the dishcloths or sponges they used for washing up (either washing or replacing them), and 68% reported they changed dishcloths or sponges used for cleaning the kitchen. Just under half reported changing dishcloths and sponges at least a couple of times a week (46% for washing up and 44% for cleaning the kitchen). For each of these cleaning practices, only 4% of respondents reported they never changed dishcloths or sponges.

85% reported changing their tea towels at least once a week. Half (52%) of respondents said they used tea towels to dry washing up at least once a day and about a fifth (19%) said they never used tea towels. Tea towels were changed at least a couple of times a week by two thirds of respondents (68%).

Figure 3.2 Cleaning practices in the kitchen (Wave 2)



Source: Q4_1A How often do you...?

Base: All respondents (3231)

Hand washing

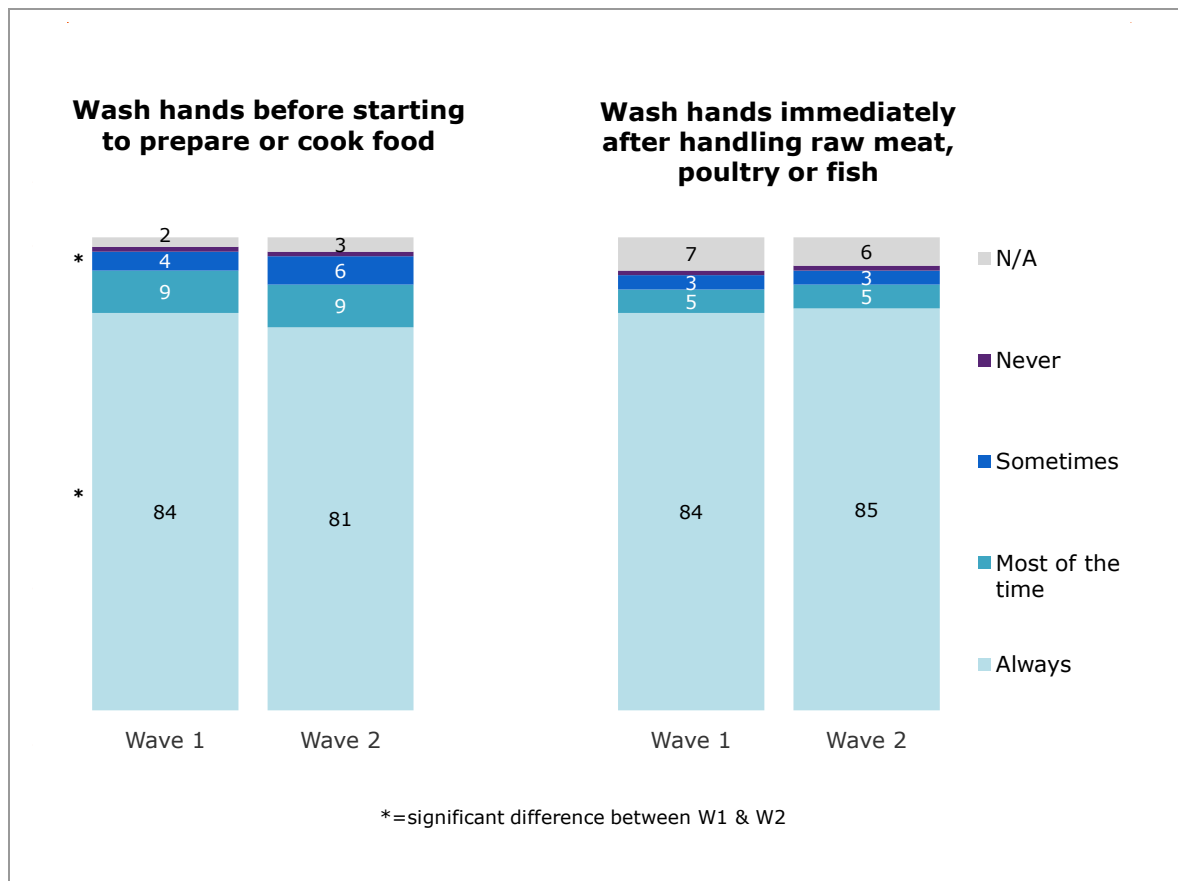
Respondents were asked how frequently they washed their hands before starting to prepare or cook food, and how often they washed their hands immediately after handling raw meat, poultry or fish. **FSA guidance is that hands should be washed thoroughly on a regular basis and in particular before preparing food, after touching raw food (especially meat) and after going to the toilet.**

Overall, 81% of respondents said they always washed their hands before starting to prepare or cook food, with 96% reporting that they do this at least some of the time. An even higher proportion of respondents (85%) reported always washing their hands immediately after handling raw meat, poultry or fish. Only 1% of respondents said they never washed their hands before preparing or cooking food or after handling raw meat, poultry or fish.

There was no significant change in the frequency of hand washing after handling raw meat, poultry or fish between Wave 1 and Wave 2. However, in Wave 2 there was a slight decrease in the proportion of respondents reporting they always wash their hands before starting to prepare or cook food (81% compared with 84% in Wave 1) and a slight increase

in the proportion of respondents reporting they sometimes do this (6% compared with 4% in Wave 1). Full results are shown in Figure 3.3.

Figure 3.3 Reported frequency of hand washing (Wave 1 and Wave 2)



Source: Q4_1 Thinking about when you are storing, preparing and cooking food, I would like you to tell me whether you do the following things at all when you are in the kitchen and if so how frequently:

Base: All respondents – Wave 1 (3163); Wave 2 (3231)

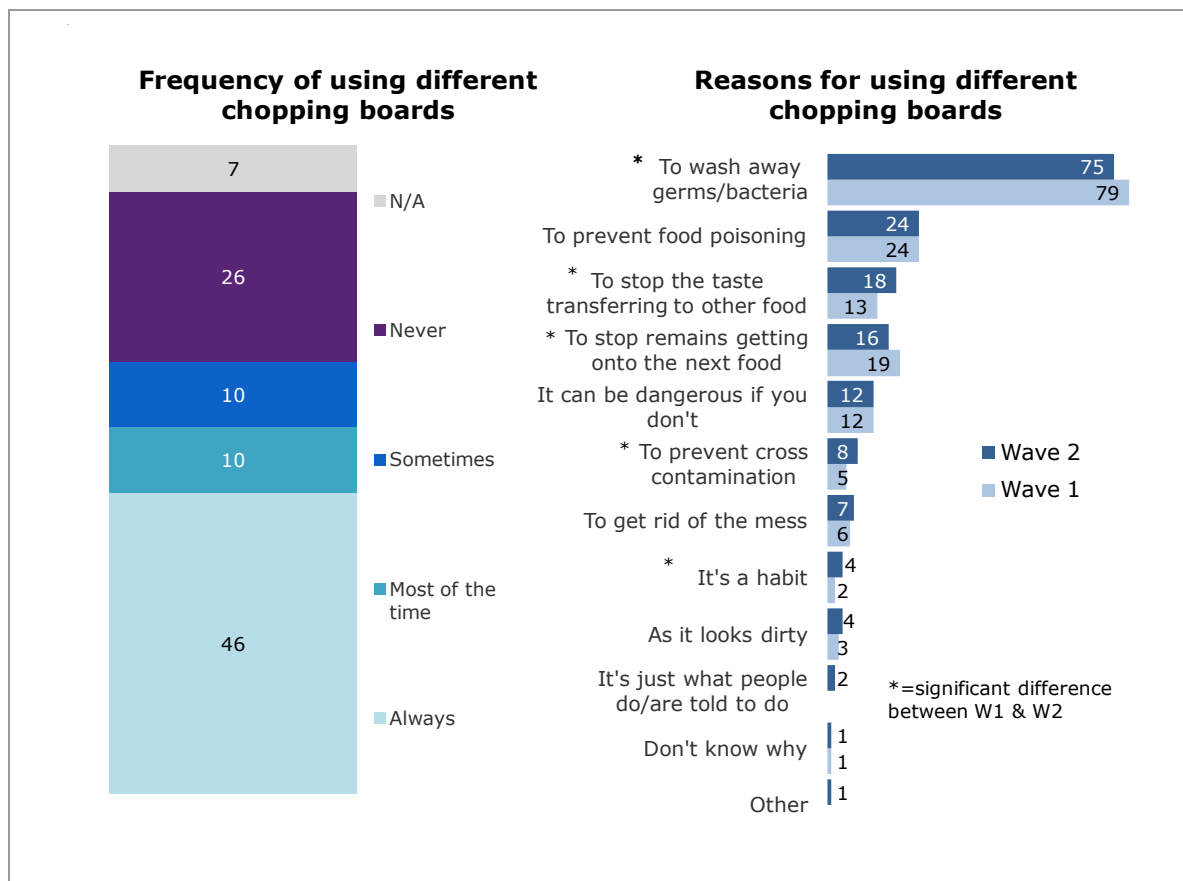
3.2.3 Reported behaviours relating to the '4 Cs' - Cross-contamination

Chopping boards

Respondents were asked whether they used different chopping boards or clean chopping boards for different foods and what they thought the reasons were for doing so after having used it to prepare raw meat, poultry or fish. **The FSA recommends using different chopping boards for raw and ready-to-eat foods, or washing thoroughly in between preparing different foods, to avoid cross-contamination.**

Forty-six per cent of respondents said they always used different chopping boards for different foods, whilst 26% said that they never did. Three-quarters (75%) of respondents reported that the reason behind washing a chopping board after preparing raw meat, poultry or fish on it, and before using it for other food, was to wash away germs or bacteria. This is a slight decrease compared with Wave 1 (79%). A quarter (24%) of respondents said it was to prevent food poisoning and 8% said it was to prevent cross-contamination (a slight increase compared with 5% in Wave 1). Other reasons commonly cited were to stop remains from getting onto the next food (16%, a decrease compared with 19% at Wave 2) and to stop the taste transferring to other food (13%, an increase compared with 18% at Wave 1). See Figure 3.4 for more detail.

Figure 3.4 Frequency of and reasons for using different chopping boards (Wave 1 and Wave 2)



Source: Q4_1 Thinking about when you are storing, preparing and cooking food, I would like you to tell me whether you do the following things at all when you are in the kitchen and if so how frequently & Q4_3 After using a chopping board to prepare raw meat, poultry or fish people might wash the board before using it again for other foods or use a clean board. Why do you think they do this?

Base: All respondents - Wave 1 (3163); Wave 2 (3231)

Food storage in the fridge

Respondents were asked about how they arranged the contents of their fridge and the reasons behind this, specifically in relation to storing raw meat, poultry and fish. **FSA guidance is to keep raw meat separate from ready-to-eat food and that raw meat and poultry should be stored in sealed containers at the bottom of the fridge, to avoid dripping onto other food.** The image below illustrates the FSA's advice on how food should be correctly stored in the fridge¹⁷.



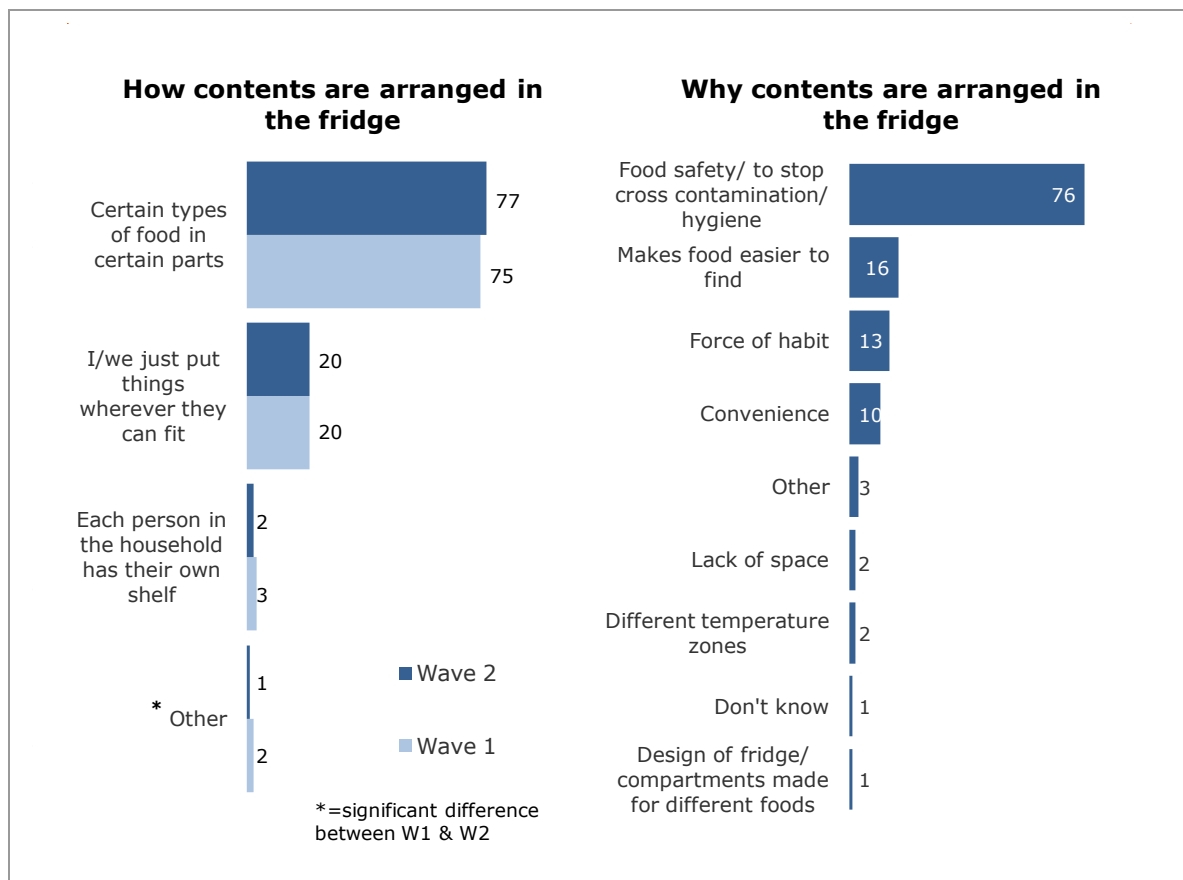
When asked how they arranged the contents of their fridge, the around three-quarters (77%) of respondents said they always kept certain types of food in a specific part of the fridge whilst 20% said they just put things wherever they fit (Figure 3.5). Of those who said

¹⁷ <http://www.food.gov.uk/northern-ireland/nutritionni/niyoungpeople/survivorform/dontgetsick/chilling#.UQkirh3HGHc>

they kept certain foods in certain parts of the fridge, three-quarters (76%) said they did so for reasons of food safety, hygiene or to stop cross contamination. Sixteen per cent said they did this because it made food easier to find. These results suggest that, of all the respondents who had a fridge in their household, 58% reported practices that were in line with FSA guidance on how food should be stored in the fridge.

There were no significant differences between Wave 1 and Wave 2 in how respondents reported food arrangement in the fridge, except for a slight decrease in the proportion of respondents who gave 'other' as a response (1% compared with 2% in Wave 2).

Figure 3.5 How and why contents were arranged in the fridge (Wave 1 and Wave 2)



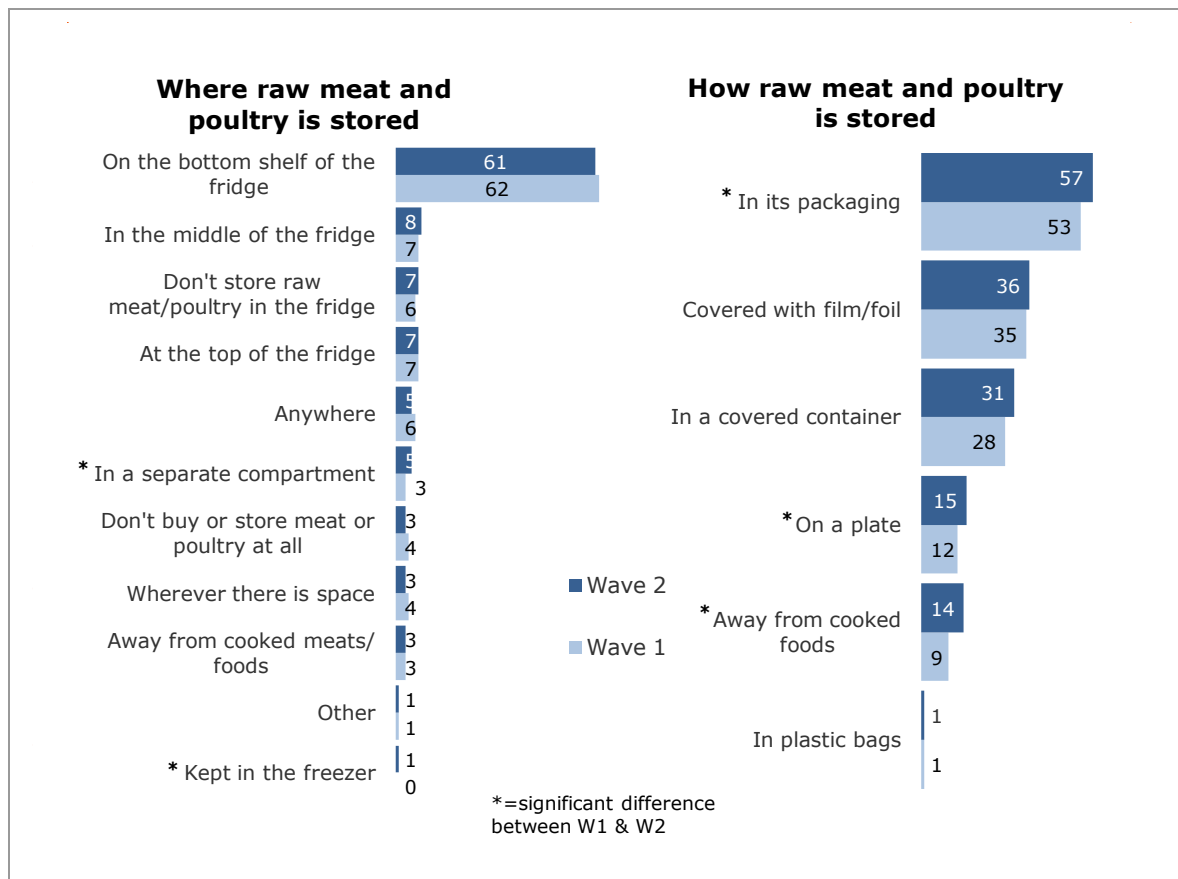
Source: Q4_13 And how do you arrange the contents of your fridge? & Q4_13A Why do you always keep certain types of food in certain parts of the fridge?

Base: Q4_13 - Wave 1-All respondents (3163); Wave 2 - All respondents who have a fridge in their household (3206); Q4_13A - All respondents who always keep certain types of food in certain parts of the fridge (2491)

All respondents who said they had a fridge in their household were specifically asked where they stored raw meat and poultry; 61% said they stored it on the bottom shelf of the fridge, with 15% said they store it either in the middle or the top of the fridge. Respondents

who reported storing raw meat and poultry in their fridge were asked how they stored it. 57% said they stored it in its packaging (an increase compared with 53% in Wave 1), 36% said they covered it with film/foil, 15% said they stored it on a plate (an increase compared with 12% in Wave 1) and 14% reported they stored it away from cooked food (an increase compared with 9% in Wave 1) (Figure 3.6).

Figure 3.6 Where and how raw meat and poultry were stored (Wave 1 and Wave 2)



Source: Q4_14 Where in the fridge do you store raw meat and poultry? & Q4_15 How do you store raw meat and poultry in the fridge?

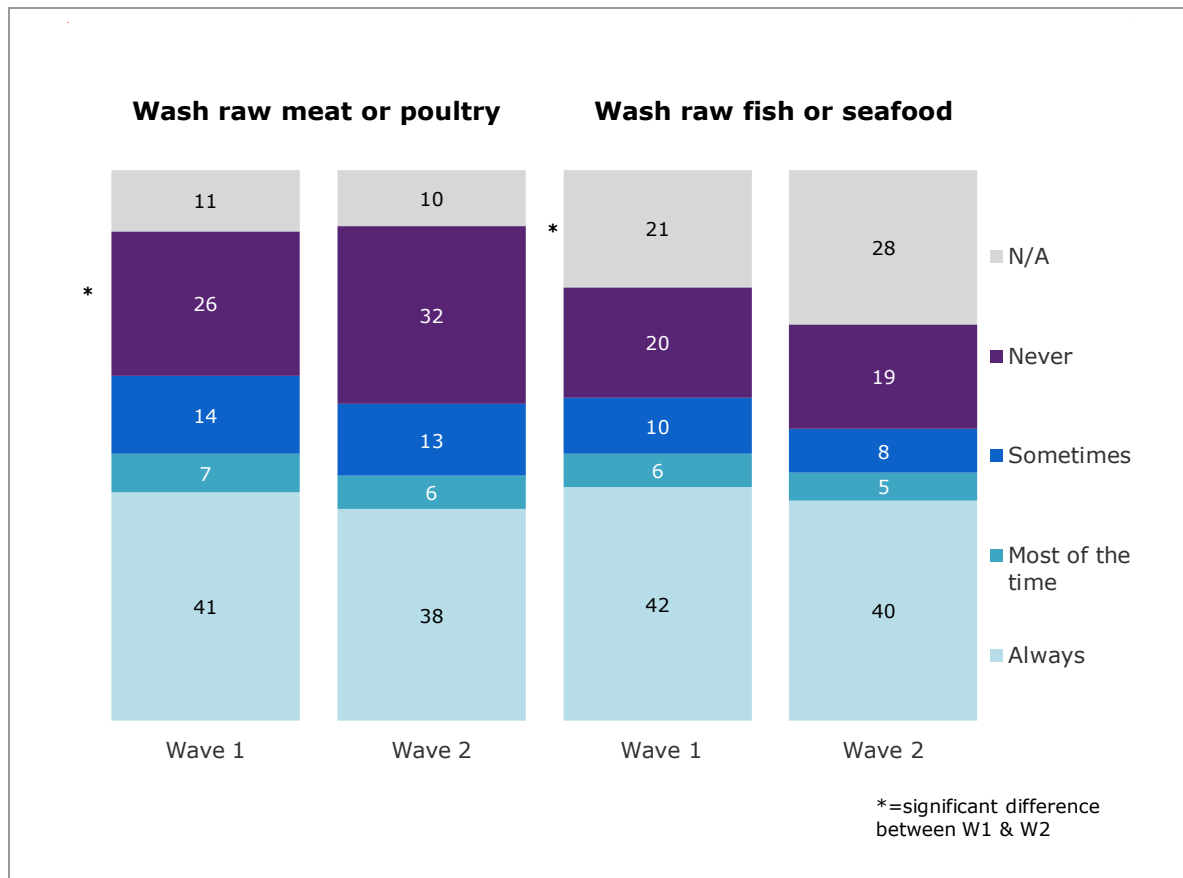
Base: Q4_14 All respondents Wave 1 (3163); All respondents who have a fridge in their household (3206) & Q4_15 Respondents who store raw meat and poultry: Wave 1(2843); Wave 2 (2921)

Washing raw meat and fish

Respondents were asked whether they washed raw meat, fish or seafood when preparing and cooking it. **The FSA recommends that meat and fish are not washed because of the risk of cross contamination.** Nineteen per cent of respondents reported that they never washed raw fish or seafood whilst 53% reported that they did at least some of the time. Forty per cent of Wave 2 respondents said they always washed raw fish or seafood.

Compared with washing fish and seafood, a higher proportion of respondents reported that they never washed raw meat or poultry (32%). This figure has also increased compared with Wave 1 (26%). Fifty-eight per cent reported they washed raw meat or poultry at least some of the time, a decrease compared with Wave 1 (63%). Thirty-eight per cent of respondents in Wave 2 said they always washed raw meat or poultry. Results are shown in Figure 3.7.

Figure 3.7 Frequency of washing raw meat, fish or poultry (Wave 1 and Wave 2)



Source: Q4_1 Thinking about when you are storing, preparing and cooking food, I would like you to tell me whether you do the following things at all when you are in the kitchen and if so how frequently

Base: All respondents: Wave 1 (3163); Wave 2 (3231)

Washing fruit and vegetables

In Wave 2, respondents were asked a new series of questions about whether or not they washed fruit or vegetables, which were to be eaten either raw or cooked. **FSA guidance is that, unless packaging around vegetables says it is 'ready-to-eat', these foods should be washed, peeled or cooked before consumption. Vegetables which are**

going to be eaten raw should be washed to help minimise the risk of food poisoning (for instance from soil).

Fifty-four per cent of respondents reported that they always washed fruit which was going to be eaten raw whilst 81% said they did this at least some of the time and 15% said they never did. Respondents were more likely to say they washed vegetables that were going to be eaten raw; 68% said that they always did, 88% said they did this at least some of the time and 5% said they never did.

When fruit was going to be cooked, a lower proportion of respondents said they would wash it compared with when it was to be eaten raw. However, 41% said they always did and 60% said they did at least some of the time, while 19% stated that they never did. Respondents were more likely to say that they washed vegetables which were going to be cooked compared with fruit; 60% said they always did, 83% said they did this at least some of the time and 10% said they never did.

3.2.4 Reported behaviours relating to the '4 Cs' - Chilling

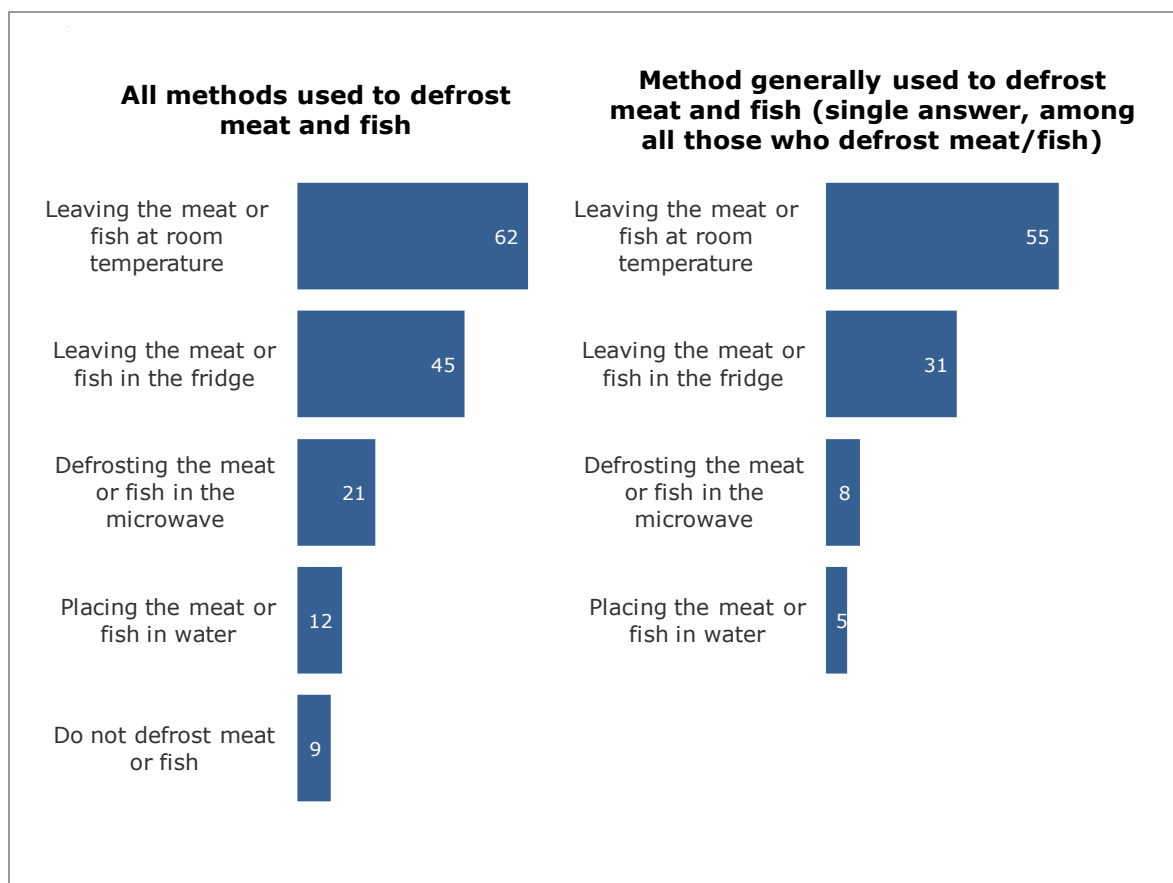
Chilling and defrosting

Respondents were asked about whether they store open tins in the fridge. The majority of respondents (70%) said they never did this, which is in line with recommended FSA guidance. Twenty-eight per cent said that they did this at least some of the time, and 6% said that they always did. There were no significant differences between Wave 1 and Wave 2 in response to this question.

Respondents were also asked about the methods they used to defrost frozen meat or fish. FSA guidance is to defrost food slowly and safely overnight in the refrigerator or to use a microwave oven (carefully ensuring that the food is fully defrosted before cooking it straight away). The FSA recommends not defrosting food at room temperature as this provides ideal conditions for bacteria to grow.

When answering the question, respondents could select more than one response; the most frequently given answer was leaving the meat or fish at room temperature (62%). Forty-five per cent of respondents said that they defrosted meat or fish in a refrigerator, and 21% in a microwave oven, in line with FSA guidelines.

Figure 3.8 Defrosting meat and fish (Wave 2)



Source: Q4_1B Which of the following methods do you use to defrost frozen meat or fish? & Q4_1C And which method do you generally use to defrost frozen meat or fish?
 Base: Q4_1B All respondents (3231) & Q4_1C All respondents who defrost frozen fish or meat (2954)

Respondents who had experienced food poisoning were more likely to say that they defrosted meat or fish in the microwave oven than those who hadn't (24% compared with 18% respectively). Those who used more than one defrosting method were asked which one they generally used. Fifty-five per cent of respondents said they generally left the meat or fish at room temperature, whilst 31% reported that they generally defrosted it in a refrigerator, and a further 8% generally used a microwave oven, in line with recommended practice.

Checking fridge temperatures

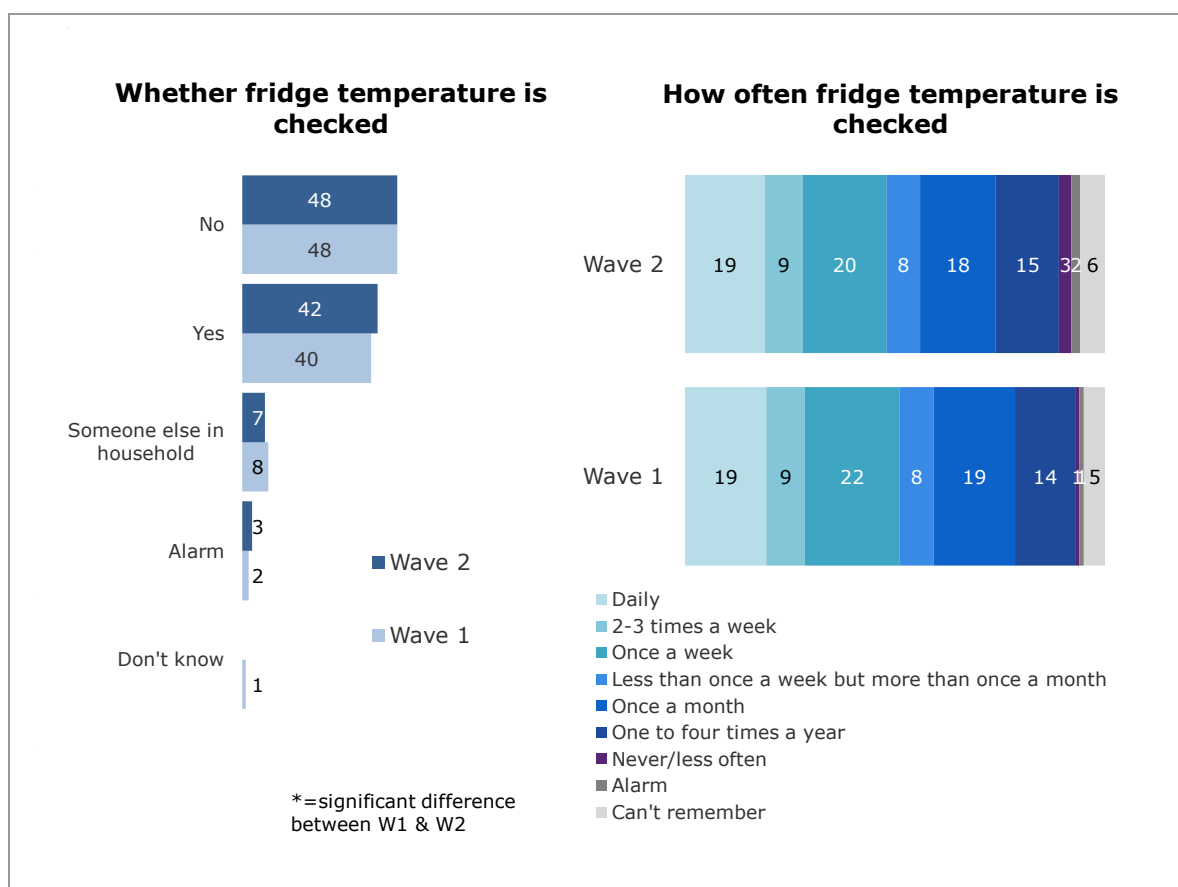
Respondents were asked several questions about their knowledge of appropriate fridge temperatures and how frequently, if at all, they checked their fridge temperature. **The FSA recommends that fridge temperatures be checked regularly and that the temperature is kept between 0-5°C to help stop food poisoning bacteria such as listeria from growing in food.**

Amongst respondents who had a fridge, 42% said that they did check the temperature, whilst 48% said that they never checked. A small minority of respondents (3%) said they did not need to check as their fridge had an alarm if it was too hot or cold and 7% said someone else in the household checked. Results are shown in Figure 3.9.

About half (48%) of respondents who checked their fridge temperature did so at least once a week. Almost a fifth of this group (19%) said they checked at least daily and over a third (36%) said they checked once a month or less.

There were no significant differences between Wave 1 and Wave 2 in the proportion who said they checked their fridge temperature or the frequency of checking.

Figure 3.9 Checking fridge temperatures (Wave 1 and Wave 2)

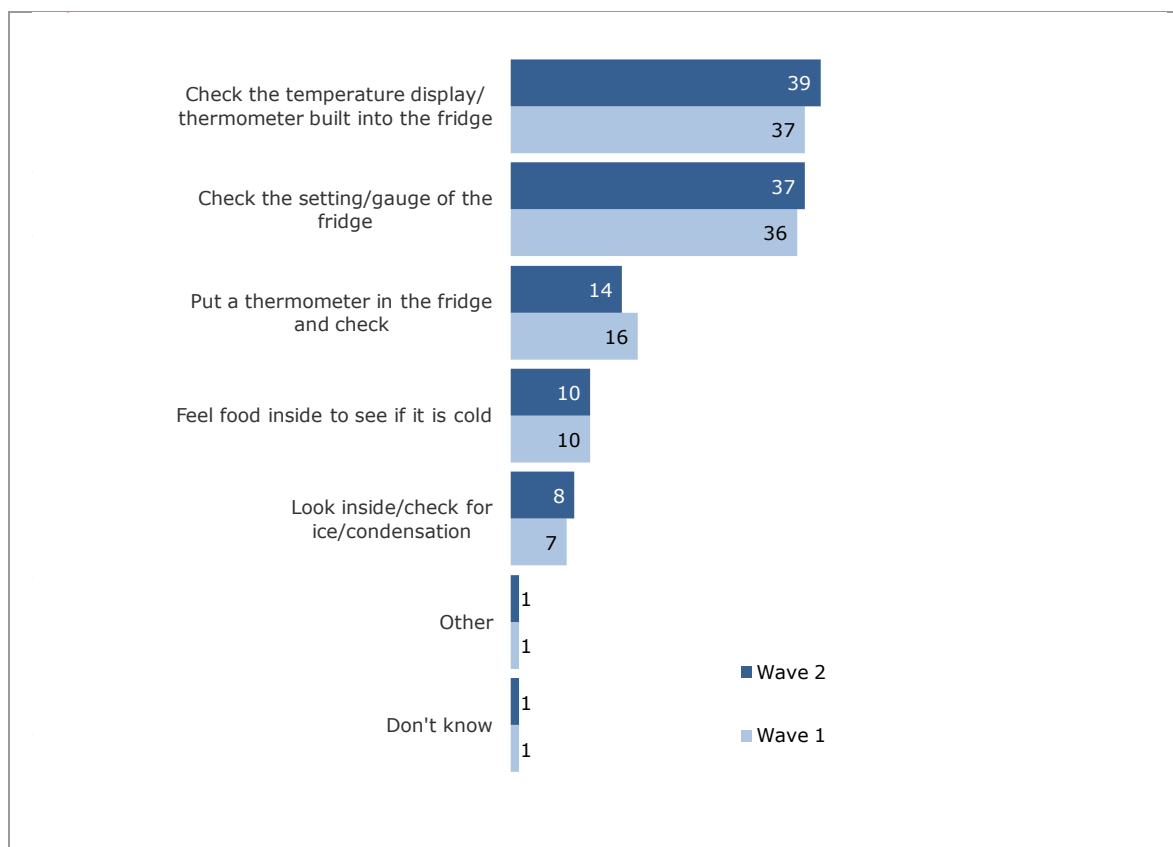


Source: Q4_9 Do you ever check your fridge temperature? & Q4_10 How often do you or another person in your household check the temperature of the fridge?

Base: Q4_9 Wave 1 - All respondents (3163); Wave 2: All respondents who have a fridge in their household (3206) & Q4_10 All respondents who check their fridge temperature - Wave 1 (1501); Wave 2 (1448)

Respondents who said they checked their fridge temperature, but did not have an alarm, were asked how they normally checked it. **The use of a thermometer is the recommended method for checking fridge temperature** and 14% of respondents reported using this method. The most common method (39%) was to check the temperature display/thermometer built into the fridge, which was closely followed by checking the setting/gauge of the fridge (37%).

Figure 3.10 How fridge temperature is checked (Wave 1 and Wave 2)

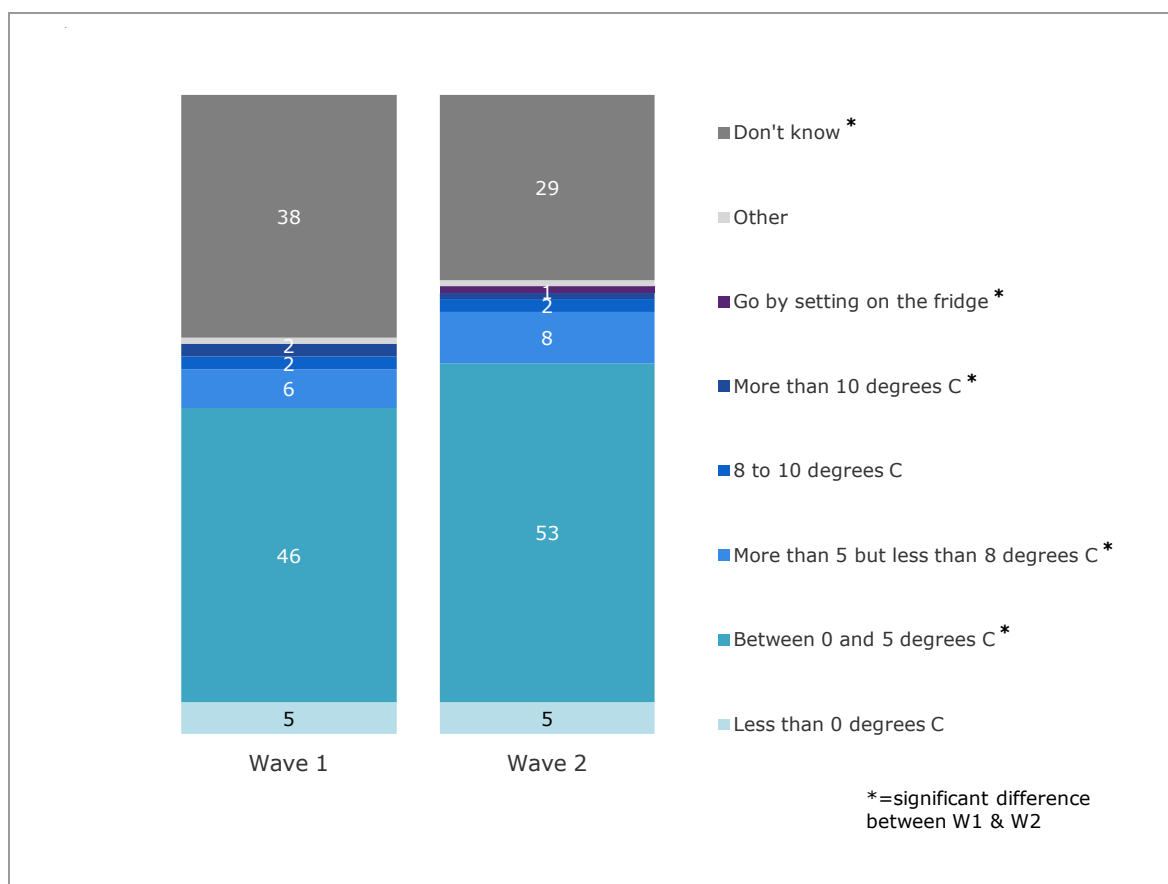


Source: Q4_11 Still thinking about fridge temperatures, can you tell me how you normally check the temperature?

Base: Respondents who do not have a fridge alarm - Wave 1 (1480); Wave 2 (1421)

When asked what respondents thought the temperature inside the fridge should be, 53% said between 0 and 5°C, which is in line with the FSA's guidelines. This proportion has increased compared with Wave 1 (46%). Twenty-nine per cent of respondents in Wave 2 reported that they did not know what the fridge temperature should be and other respondents gave a range of answers. Full results are shown in Figure 3.11.

Figure 3.11 Knowledge of what fridge temperature should be (Wave 1 and Wave 2)



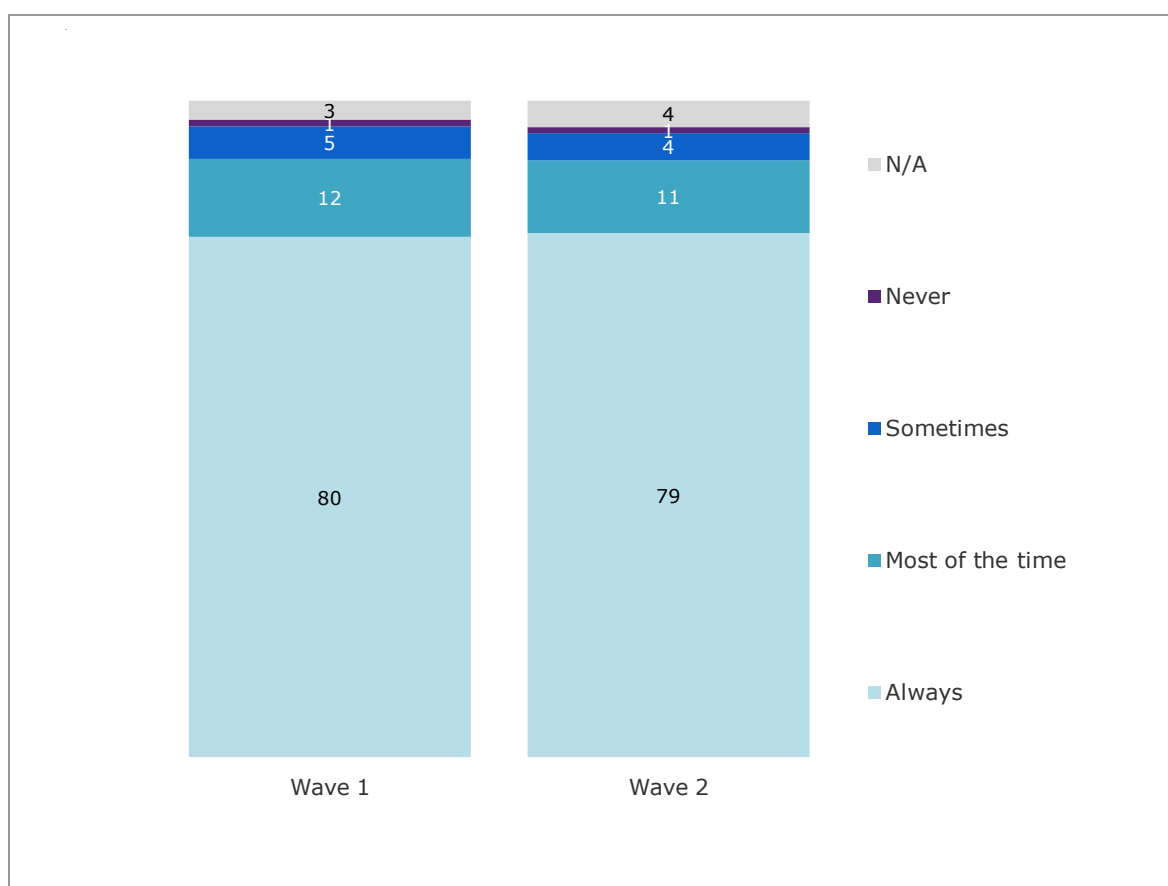
Source: Q4_12 What do you think the temperature inside your fridge should be?
 Base: Wave 1 All respondents (3163); Wave 2 All respondents with a fridge in their household (3206)

3.2.5 Reported behaviours relating to the '4 Cs' – Cooking

Cooking food until steaming hot

The FSA recommends that all food is cooked to steaming hot. In Wave 2, 79% of respondents reported that they always did this, with only 1% of respondents reporting that they never did this. These figures are similar to Wave 1. See Figure 3.12.

Figure 3.12 Frequency of cooking food until it is steaming hot (Wave 1 and Wave 2)



Source: Q4_1 Thinking about when you are storing, preparing and cooking food, I would like you to tell me whether you do the following things at all when you are in the kitchen and if so how frequently?

Base: Q4_1 All respondents- Wave 1(3163); Wave 2 (3231)

Cooking meat, poultry and sausages or burgers

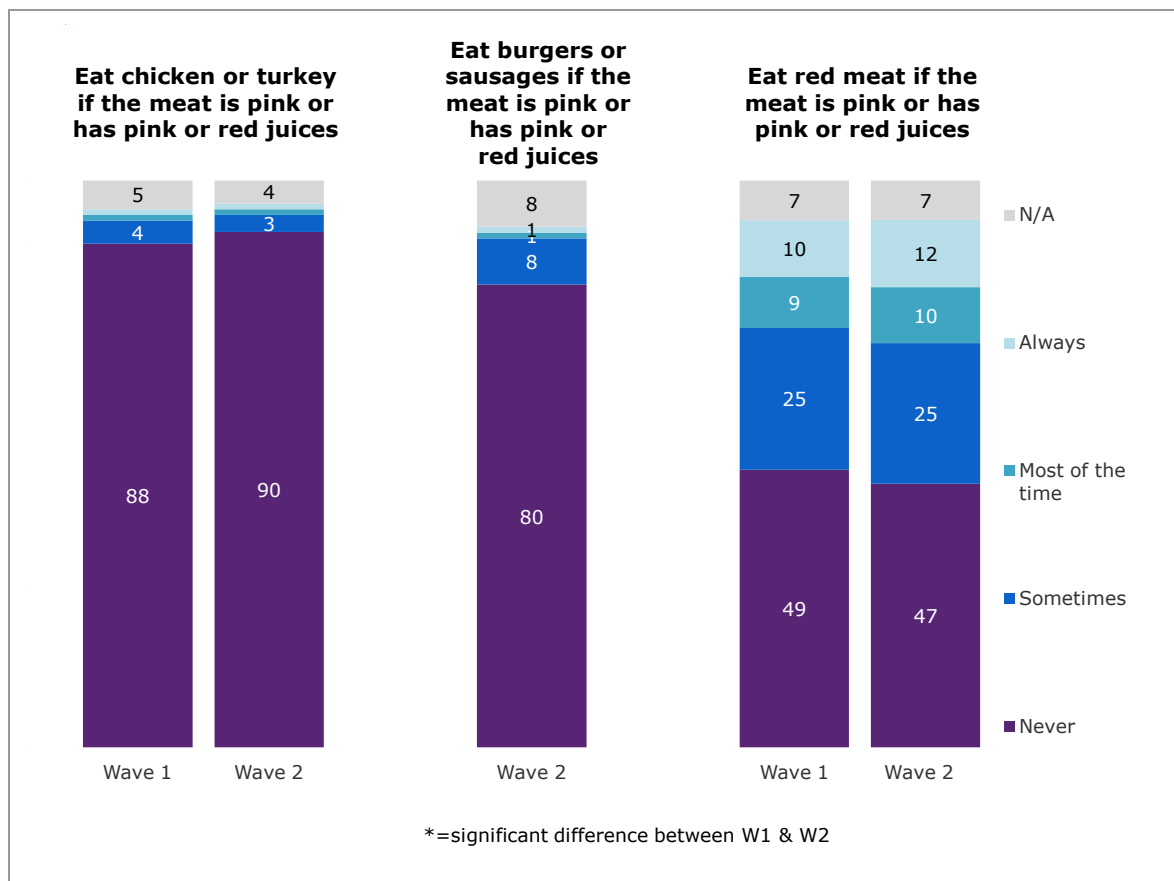
Respondents were asked how often they ate meat when it was pink or had pink/red juices. The FSA guidance is to ensure that poultry, pork, burgers, sausages and kebabs are properly cooked all the way through, that is, they are not pink and have no pink/red juices. Steaks and other whole cuts of beef and lamb may be eaten rare, as long as they have been properly cooked and sealed on the outside¹⁸.

Only 1% of respondents said they always ate chicken or turkey if the meat was pink or had pink/red juices whilst 3% said that they sometimes did. Ninety per cent of respondents reported that they never ate chicken or turkey if the meat was pink or had pink/red juices. Similarly, 1% of respondents said that they always ate burgers or sausages if the meat

¹⁸ Advice about steak and beef is fine for the majority, but the FSA advises at risk groups (especially pregnant mothers, the very elderly and those who are immuno-compromised) not to eat rare lamb owing to risk of toxoplasmosis.

was pink or had pink/red juices and 8% said that they sometimes did. Eighty per cent of respondents said they never ate burgers or sausages if the meat was pink or had pink/red juices. For red meat, 12% of respondents said they always ate red meat if it was pink or had pink/red juices, and 47% reported they never did. 25% said they sometimes did and 10% said they did most of the time. All these proportions are similar to Wave 1 (Figure 3.13).

Figure 3.13 Frequency of eating chicken or turkey and burgers or sausages or red meat if the meat is pink or has pink/red juices (Wave 1 and Wave 2)



Source: Q4_1 Thinking about when you are storing, preparing and cooking food, I would like you to tell me whether you do the following things at all when you are in the kitchen and if so how frequently?

Base: Q4_1 All respondents- Wave 1(3163); Wave 2 (3231)

Reheating

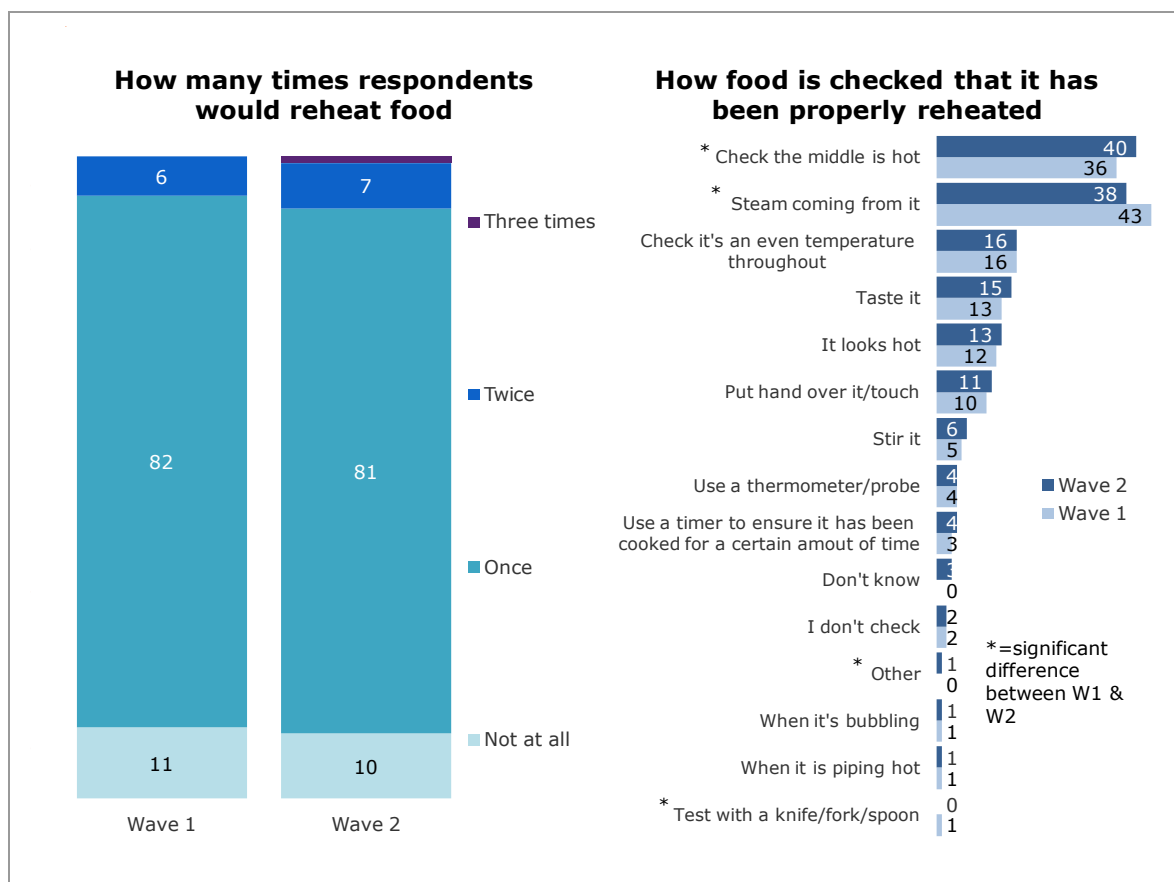
All respondents who reported they ate leftovers were asked how many times they would consider re-heating food, and how they could tell that food had been re-heated properly.

FSA guidance is not to reheat leftovers more than once and to cook the leftovers until they are steaming hot throughout. Eighty-one per cent of respondents said they would only re-heat food once, while 10% said they wouldn't re-heat food at all. A small

group of respondents (8%) said they would re-heat food twice or more and (1%) said they would reheat food three times or more. Proportions for Wave 2 were not significantly different to those reported in Wave 1 (Figure 3.14).

Forty per cent of respondents reported testing if food had been properly reheated by checking if the middle is hot. This is an increase compared with Wave 1 (36%) and has replaced seeing if steam is coming out of food as the most commonly reported method (38% in Wave 2, 43% in Wave 1). A small minority of respondents (2%) said they did not check to see if food had been re-heated properly.

Figure 3.14 Reheating food (Wave 1 and Wave 2)



Source: Q4_25 How many times would you consider re-heating food after it was cooked for the first time? & Q4_26 And how do you usually tell that food has been re-heated properly?

Base: Q4_25 All respondents who have leftovers: Wave 1(2937); Wave 2(2948) & Q2_46 All respondents who have leftovers and would consider re-heating: Wave 1(2585); Wave 2(2618).

3.2.6 Methods used to tell whether food is safe to eat

Respondents were asked a series of questions about:

- how they could tell if food was safe to eat or use in cooking;
- what they thought was the best indicator of whether food was safe to eat; and,
- whether they checked use by dates when buying and using food.

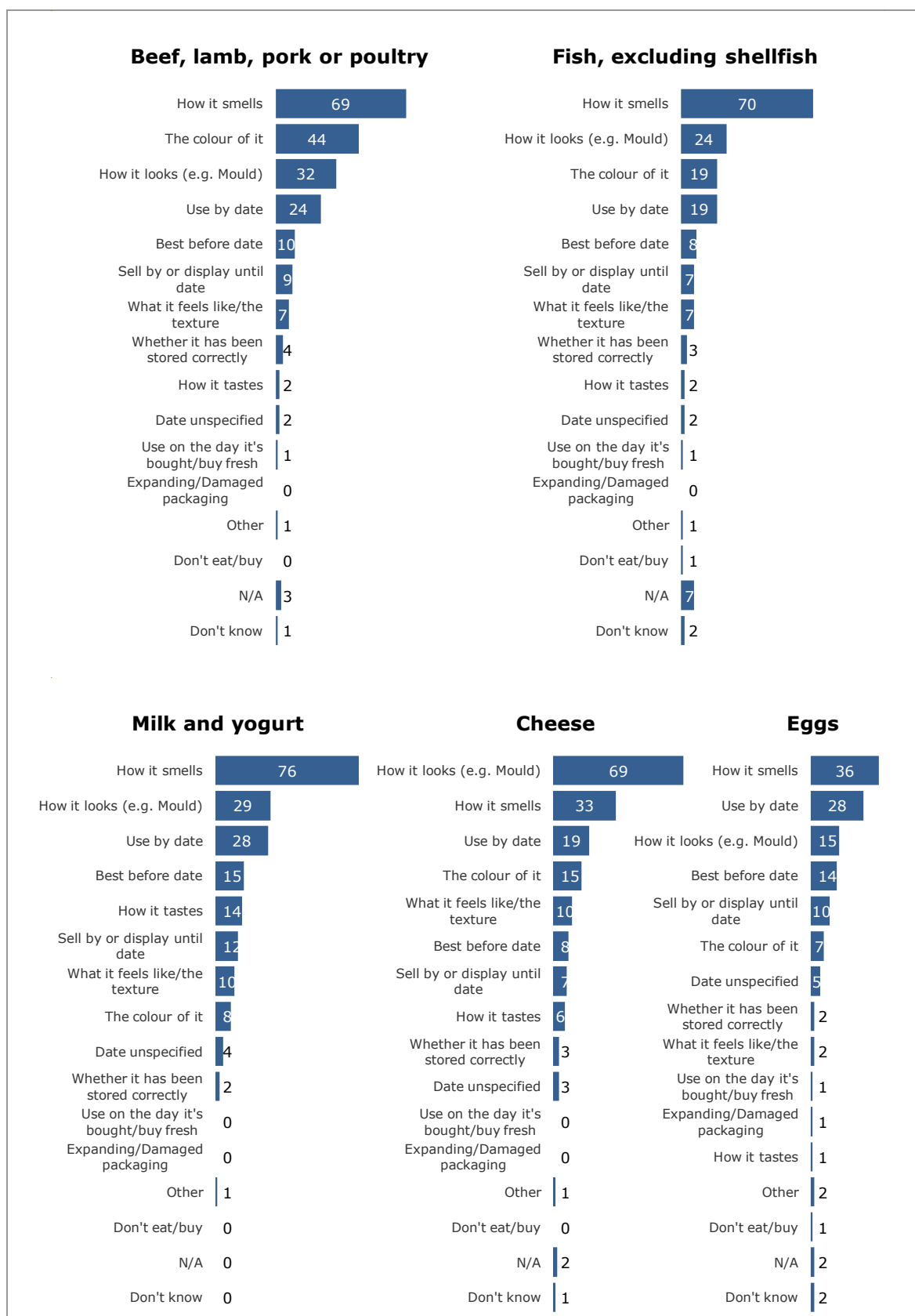
The FSA guidance is that even if the food looks and smells fine, the use by date is the best indicator of whether food is safe to eat.

How food smelled was one of the most common ways respondents said they could tell whether a food was safe to eat, and was the most commonly reported method for meat, fish, milk/yoghurt and eggs. For example, three-quarters (76%) of respondents said they used this method when checking whether milk or yoghurt was safe to eat and 70% used smell as an indicator for fish. How food looks (for example the appearance of mould) was the most common practice (69%) for telling whether cheese was safe to eat. For meat, colour was the second most reported method (44%).

Use by dates were also mentioned as an indicator of whether food was safe; 28% said they used it for checking milk/yoghurt and the same proportion used it for checking eggs. Sixteen per cent also said they checked whether eggs floated in water to tell whether they were safe to eat. Very few respondents said they used food on the day it was bought or bought it fresh so that they knew it was safe to eat (Figure 3.15).

These findings support research by Green et al (2003) which, using qualitative methods, also found that people adopt 'rules of thumb' to appraise the relative safety of food items, that include relying on smell and appearance to make everyday complex risk assessments. The Greenstreet Berman review found that use of food labels (use by dates, cooking instructions) was limited, with some confusion about the meaning of different label types and particularly use by dates versus best before dates. This confusion was particularly notable amongst older people (over 60), with some cynicism regarding their application and use by industry (SSRC, 2009).

Figure 3.15 Methods used to tell whether food is safe to eat (Wave 2)



Source: Q4_18 For each of the following foods, please say how you can tell whether it is safe to eat or use in cooking? Base: All respondents (3231)

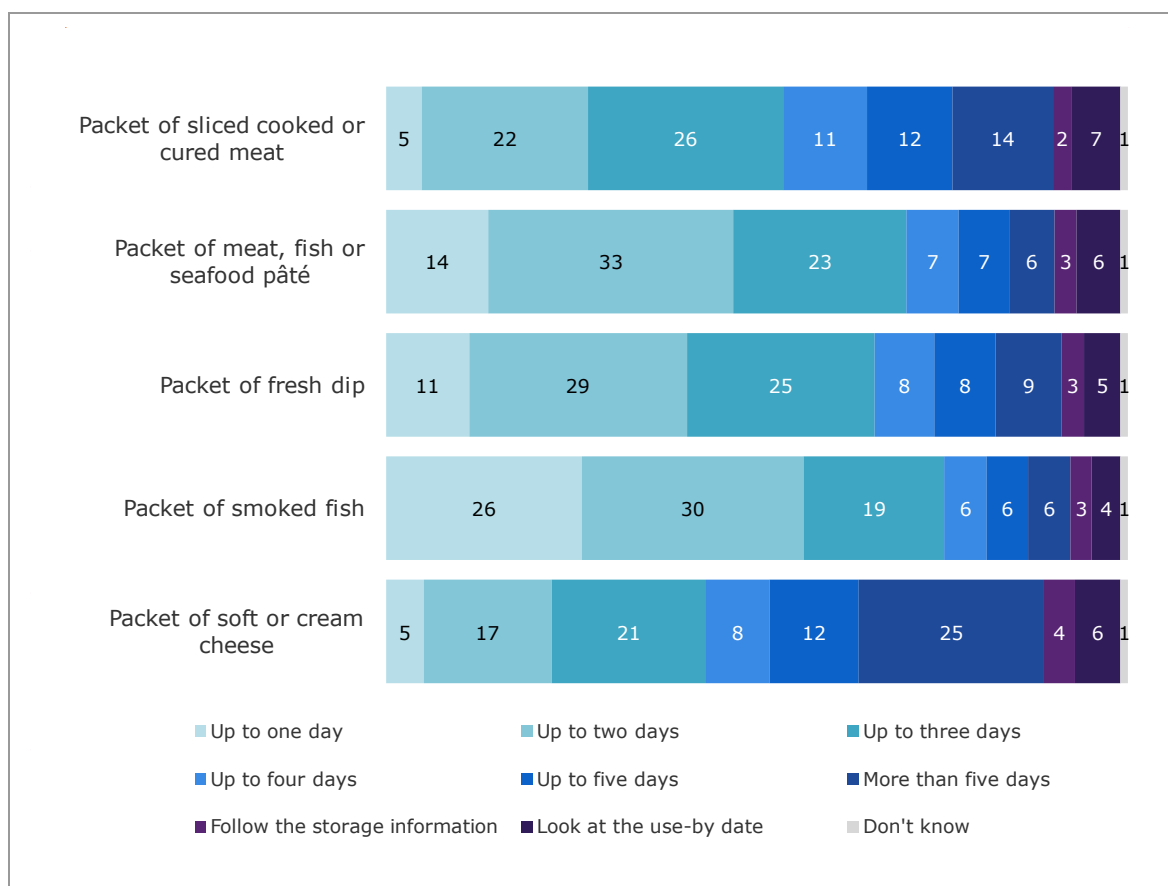
Storage information

Respondents were asked what would be the maximum number of days they would keep various food items in the fridge after opening them. All respondents were asked about all food items, but were given the option to state that they did not eat/use each item¹⁹. These respondents have been removed from the data reported, so that it is reflective only of those actually using each item, making it easier to make comparisons across the different food types. **The FSA recommends using opened foods within two days, unless the manufacturer's instructions say otherwise.**

Respondents were most likely to report consuming food within two days for 'smoked fish' (56%) and 'meat, fish or seafood pâté' (47%). Respondents were least likely to report consuming soft cheese (22%) within two days. A minority of users reported that they would look at the use by date or follow the storage information on the product (between 4% and 7% of respondents stated they would look at the use by date and between 2% and 4% stated that they would follow storage information). See Figure 3.16 for more detail.

¹⁹ Out of all respondents, 9% said they did not eat/use packets of sliced cooked or cured meat, 19% did not eat/use packets of meat, fish or seafood pâté, 19% did not eat/use packets of fresh dip, 27% did not use packets of smoked fish and 16% did not eat/use packets of soft or cream cheese.

Figure 3.16 Maximum time respondents would eat/use food after opening it (Wave 2)



Source: Q4_23A If you open ... and keep it stored in the fridge, what is the maximum number of days you would keep it in the fridge for before deciding you would definitely not eat it?

Base: Q4_23A All respondents, excluding those who do not eat/use each food item – Packet of sliced cooked or cured meat (2940); Packet of meat, fish or seafood pâté (2519); Packet of fresh dip (2442); Packet of smoked fish (2242); Packet of soft or cream cheese (2565)

Use by and best before dates

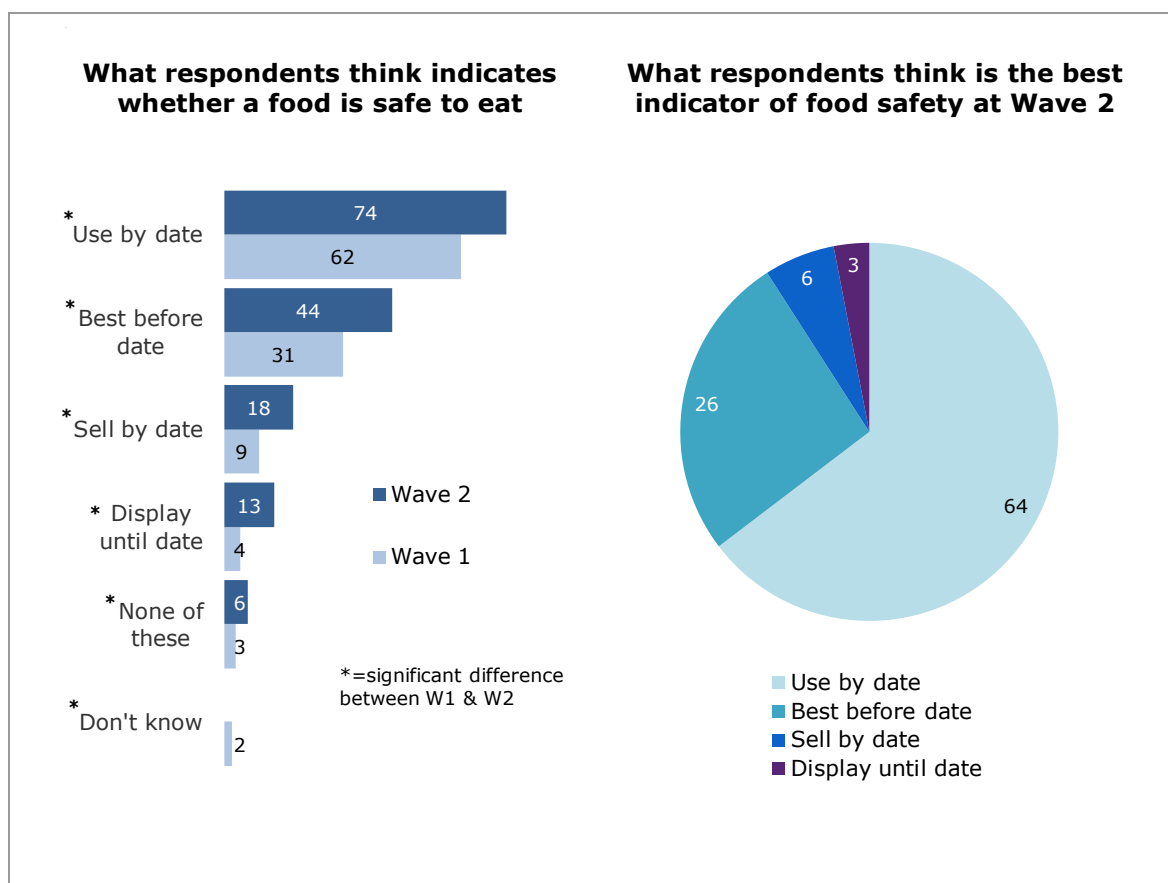
Respondents were presented with a list of indicators which are typically found on food packaging and were asked which of these indicated whether food was safe to eat; respondents were able to select more than one response in both waves therefore the increase seen across all indicators should be interpreted with this in mind. **FSA guidance is that the use by date is the best indicator of whether food is safe to eat and food should not be eaten after this date.**

Three quarters (74%) of respondents cited use by dates as an indicator of whether food was safe to eat. This was an increase compared with Wave 1 (62%). However, the proportion of respondents who *only* mentioned the use by date was the same in Wave 2

as in Wave 1 (both 44%). Ten per cent of respondents mentioned all four options (use by, best before, sell by, display until dates) as indicators.

Respondents were then asked which one of the four dates was the best indicator of food safety; 64% selected the use by date while 26% selected the best before date. Results are also shown in Figure 3.17.

Figure 3.17 Indicators of food safety (Wave 1 and Wave 2)



Source: Q4_19 Which of these indicates whether food is safe to eat? & Q4_19B Which of these is the best indicator of whether food is safe to eat?

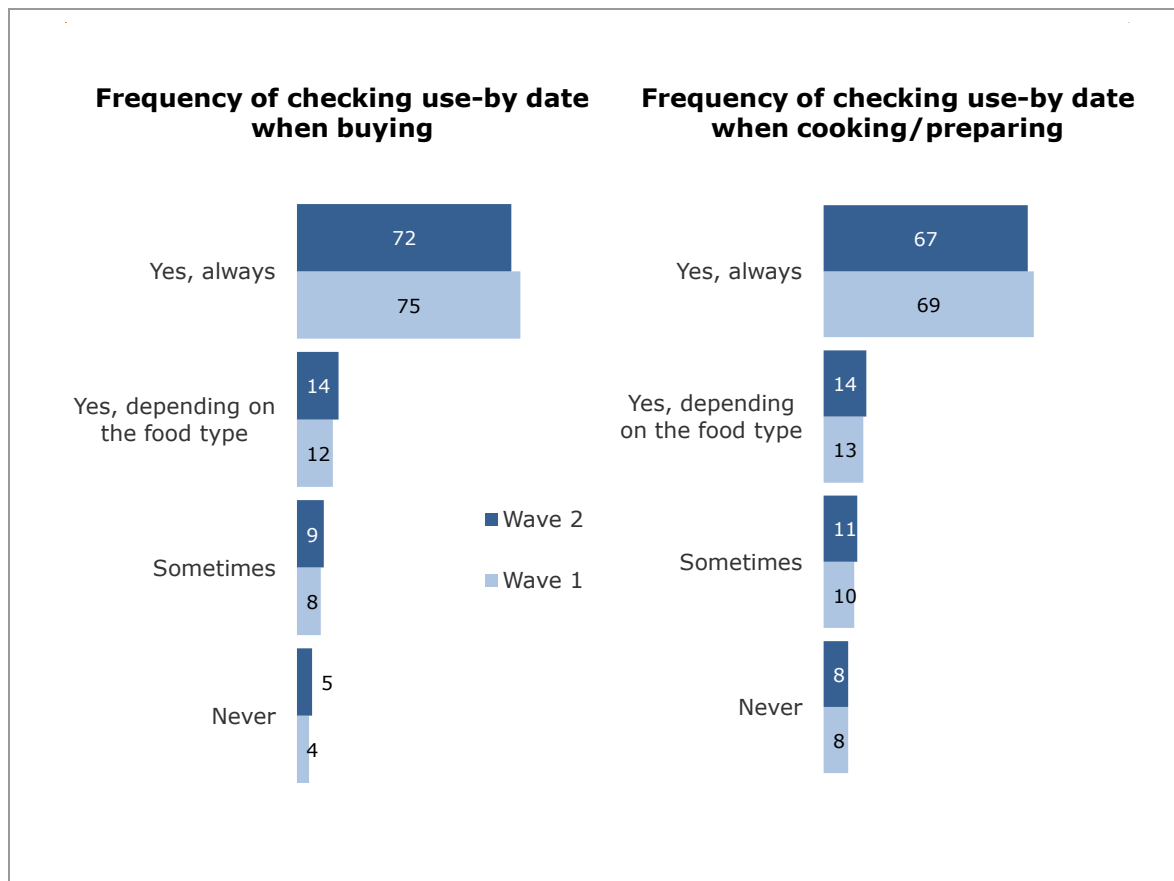
Base: Q4_19 All respondents: Wave 1 (3163); Wave 2 (3231) & Q4_19B All respondents: Wave 2 (3231)

When asked if they checked use by dates when buying food: 72% said that they always did regardless of food type (unchanged from Wave 1 - 75%) and 14% reported that they did depending on food type. A very small proportion in both waves said they never checked (4% in Wave 1 and 5% in Wave 2). Full results are shown in Figure 3.18.

The proportion of respondents who reported checking use by dates when cooking / preparing food was slightly lower than for buying food: 67% said they always checked the

use by date when cooking/preparing food and 14% said they did depending on food type. A minority (8%) said they never checked the use by date when cooking/preparing food.

Figure 3.18 Frequency of checking use by date (Wave 1 and Wave 2)



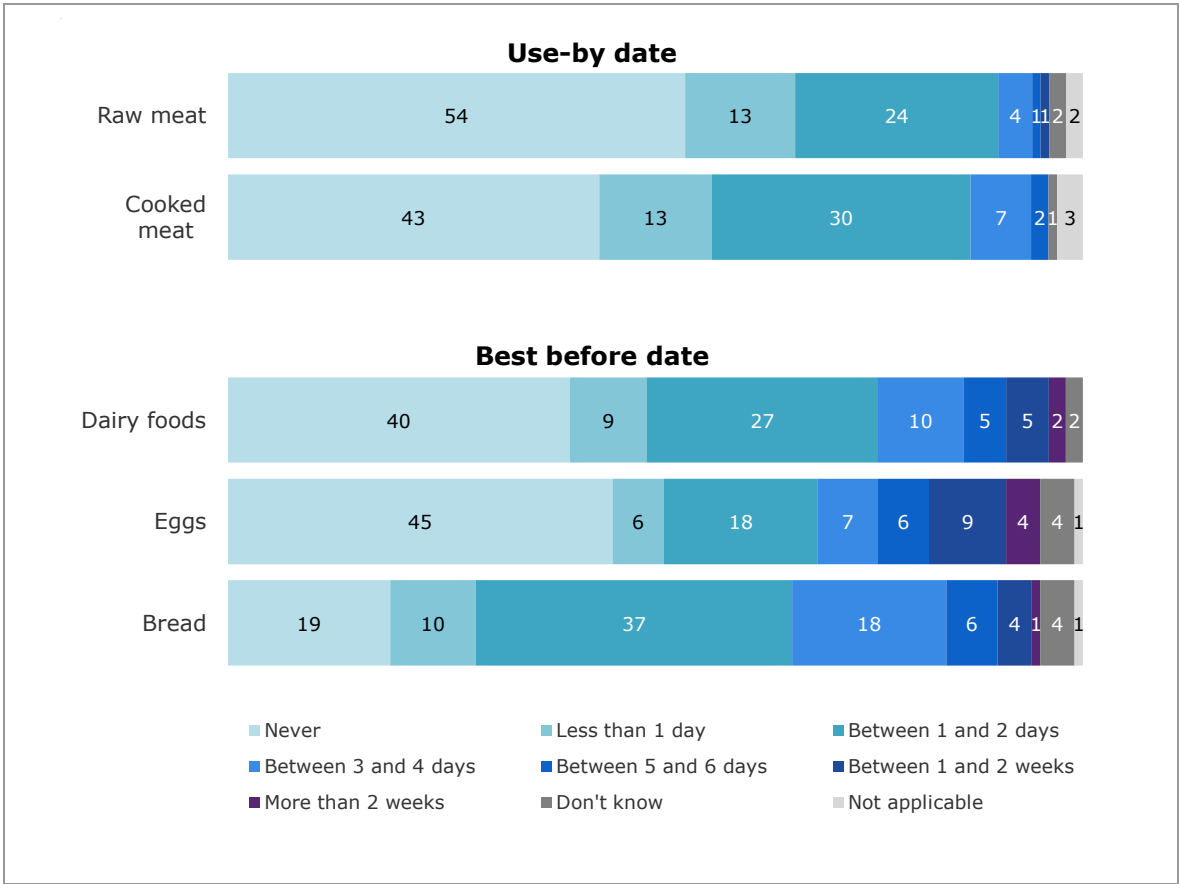
Source: Q4_21 Do you check use by dates when you are buying food? & Q4_22 Do you check use by dates when you are about to cook or prepare food?
 Base: Q4_21 & Q4_22 All respondents- Wave 1(3163); Wave 2(3231)

Respondents were asked what would be the maximum time after the use by or best before date that they would eat certain foods. The FSA guidance on use by dates is that foods should be consumed before the specified use by date as it could be dangerous to eat food after this, even though it might look and smell fine. Best before dates appear on food with a longer shelf life. They show how long the food will be at its best quality. Using food after the best before date does not mean it will be unsafe with the exception of eggs (raw egg must be consumed by the best before date although cooked egg, provided it is cooked thoroughly by the best before date, can be consumed a day or two after the best before date).

When asked about bread and eggs, respondents tended to say that they would eat them for longer after the best before date compared with any other food. For example 29% and

25% said they would eat bread and eggs (respectively) 3 days or more after the best before date. Nine per cent of respondents reported that they would eat cooked meat 3 days or more after the use by date. A smaller proportion of respondents said they would eat foods five days or more after the use by/best before date; for example 12% said they would eat dairy foods five days or after and 3% said the same for cooked meat (Figure 3.19).

Figure 3.19 Maximum time after use by date/best before date that respondents would eat / use food (Wave 2)



Source: Q11_6 What is the maximum time after the use by date/best before date that you would use/eat...?

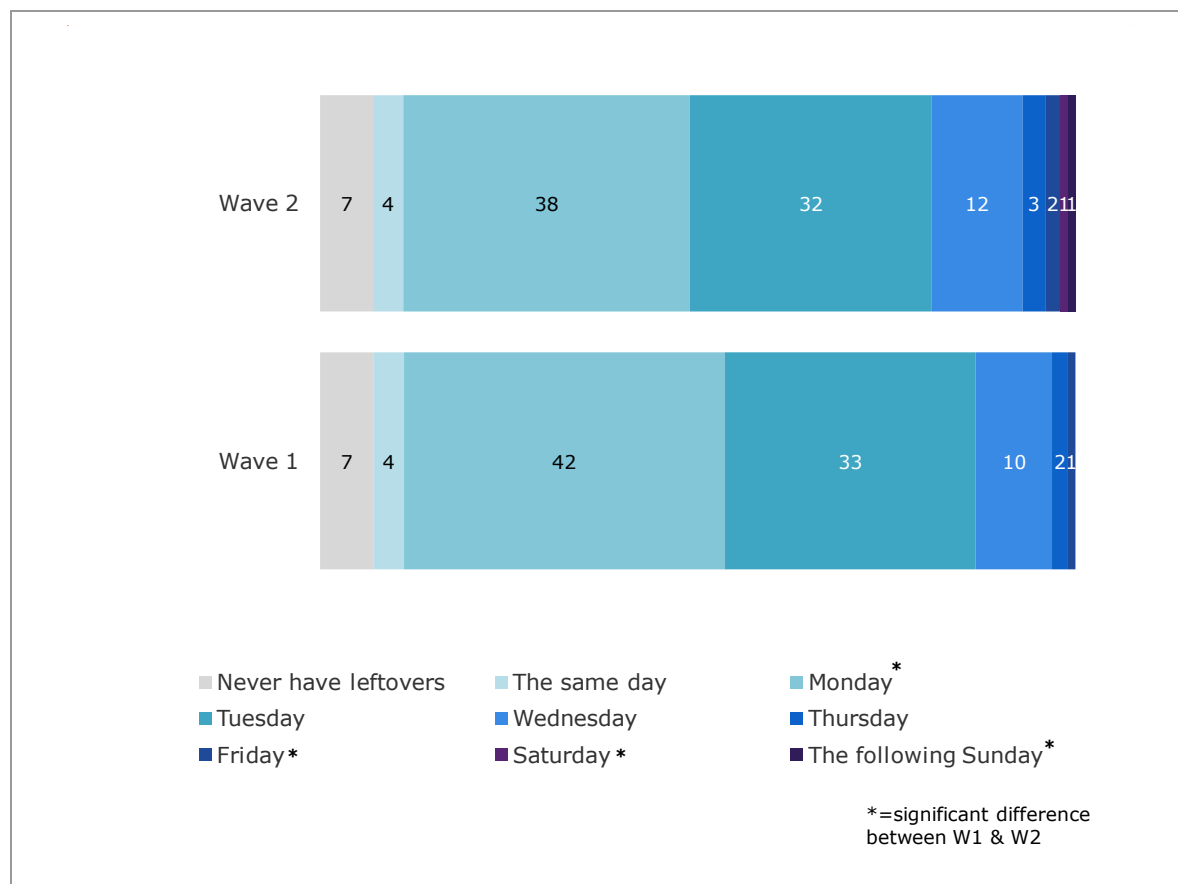
Base: All respondents - (3231)

Maximum time for keeping leftovers

Respondents were asked, if they made a meal on Sunday, what would be the last day they would consider eating leftovers. **The FSA guidance is that leftovers should be used within two days (that is, up to Tuesday).** Results for both waves are shown in Figure 3.20.

Three-quarters (74%) of respondents reported that, if they cooked a meal on Sunday, Tuesday was the last day they would consider eating the leftover. Respondents most commonly reported that they would eat leftovers the next day (38% - a decrease compared to 42% in Wave 1) and 32% said they would eat them on the Tuesday. A fifth of respondents (19%) said they would eat the leftovers three days or more after cooking (i.e. Wednesday or after).

Figure 3.20 Last day respondents would consider eating leftovers from a meal (having cooked it on Sunday) (Wave 1 and Wave 2)



Source: Q4_24 If you made a meal on Sunday, what is the last day that you would consider eating the leftovers? Base: All respondents - Wave 1 (3163); Wave 2 (3231)

3.2.7 Variation in food safety practices (4Cs and methods used to tell whether food is safe to eat) by different groups in the population

Reported food safety practices were found to vary considerably by **gender** with women, in general, being more likely than men to report food safety practices in line with Agency recommended practice (RP) for:

- Cleaning sinks, surfaces and changing tea towels (e.g. 95% of women reported cleaning their sink thoroughly at least once a week compared with 87% of men);
- Always washing hands before preparing food (87% compared with 76%) and after handling raw meat (89% compared with 79%);
- Storing certain foods in certain parts of the fridge (82% compared with 72%);
- Washing fruit and vegetables (e.g. 62% of women reported always washing fruit to be eaten raw compared with 47% of men);
- Checking use by dates before cooking or preparing food (71% compared with 63%); and
- Not eating food three days or more after the use by date (e.g. for raw meat 4% compared with 9%)

However, there were two areas where women were less likely than men to report practices that were in line with RP: they were more likely than men to wash raw meat or poultry (44% compared with 36%), and less likely to know that the fridge temperature should be between 0-5°C (48% compared with 58%).

Age was also a factor. Whilst respondents aged 25-44 were generally the most likely to report behaviour in line with RP, younger respondents (those aged 16-24) were less likely than other age groups to report some practices that were in line with RP for food safety. For example:

- More infrequent changing of tea towels and dishcloths (e.g. 57% of 16-24 said they changed their tea towels at least once a week compared with 91% of those aged 60 or more);
- Lower levels of hand washing (73% of 16-24 compared with 82-84% of all other age groups); and
- Storing open tins in the fridge (40% of 16-24 compared with 14% of those aged 75 and over);

However, the oldest respondents (aged 75 and over) were also found to be less likely to report some food safety practices that were in line with RP compared with all other age groups. For example:

- Washing raw meat (45% of 75+ reported washing raw meat compared with 25% of 16-24 year olds);

- Not checking their fridge temperature (57% compared with 45% of 16-24 year olds); and
- Less likely to report that the use by date is an indicator that food was safe to eat (60% compared with 78% of respondents aged 45 or below).

As might be expected, **type of diet** was associated with variations in reported food safety practices. A whole range of issues to do with practices relating to storage, handling, cooking and defrosting of meat are irrelevant for households who do not eat meat. Further, vegetarians were found to be more likely than others to report always washing fruit and vegetables before using them (for example, 69% compared with 54% for fruit that is going to be eaten raw and 79% compared with 68% for vegetables/salad that are going to be eaten raw).

A mixed picture emerged on variations in food practices by **level of education**. On the one hand, compared to respondents without a degree, respondents educated to a degree level or higher were less likely to report cleaning practices that were in line with recommended practice. For example

- More infrequent changing of tea towels and dishcloths (e.g. 33% of respondents educated to a degree level or higher reported changing dishcloths used for washing up at least a couple of times a week compared to 51% of respondents who do not have a degree);
- Lower levels of cleaning (e.g. 47% of respondents educated to a degree level or higher reported cleaning their sinks and draining boards on a daily basis compared to 62% of respondents who do not have a degree)

On the other hand, respondents educated to a degree level or higher were more likely to report use by practices in line with recommended practice. For example:

- More likely to state that the use by date is the best indicator of food safety (73% compared to 61% of respondents who do not have a degree);
- More likely to report never consuming food after the use by date (e.g. 30% reported never consuming dairy products after the use by date compared to 44% of respondents who do not have degree).

Respondents with **children under the age of six in their household** were more likely to report some cleaning and use by date practices in line with recommended practice compared to respondents who did not have children under the age of six living in their household.

- Higher levels of hand washing after handling raw meat, poultry or fish (91% compared to 84%);
- More frequent cleaning of kitchen surfaces (47% reported wiping kitchen surface more than once a day compared with 36%);
- More likely to state the use by date is the best indicator of food (70% compared with 63%); and
- More likely to report never consuming food after the use by date (e.g 64% reported never consuming raw meat after the use by date compared to 52% of respondent who do not have children under the age of six in their household).

These variations by socio-demographic groups are largely consistent with the Greenstreet Berman review which noted, across previous studies, the following differences in food safety practices²⁰:

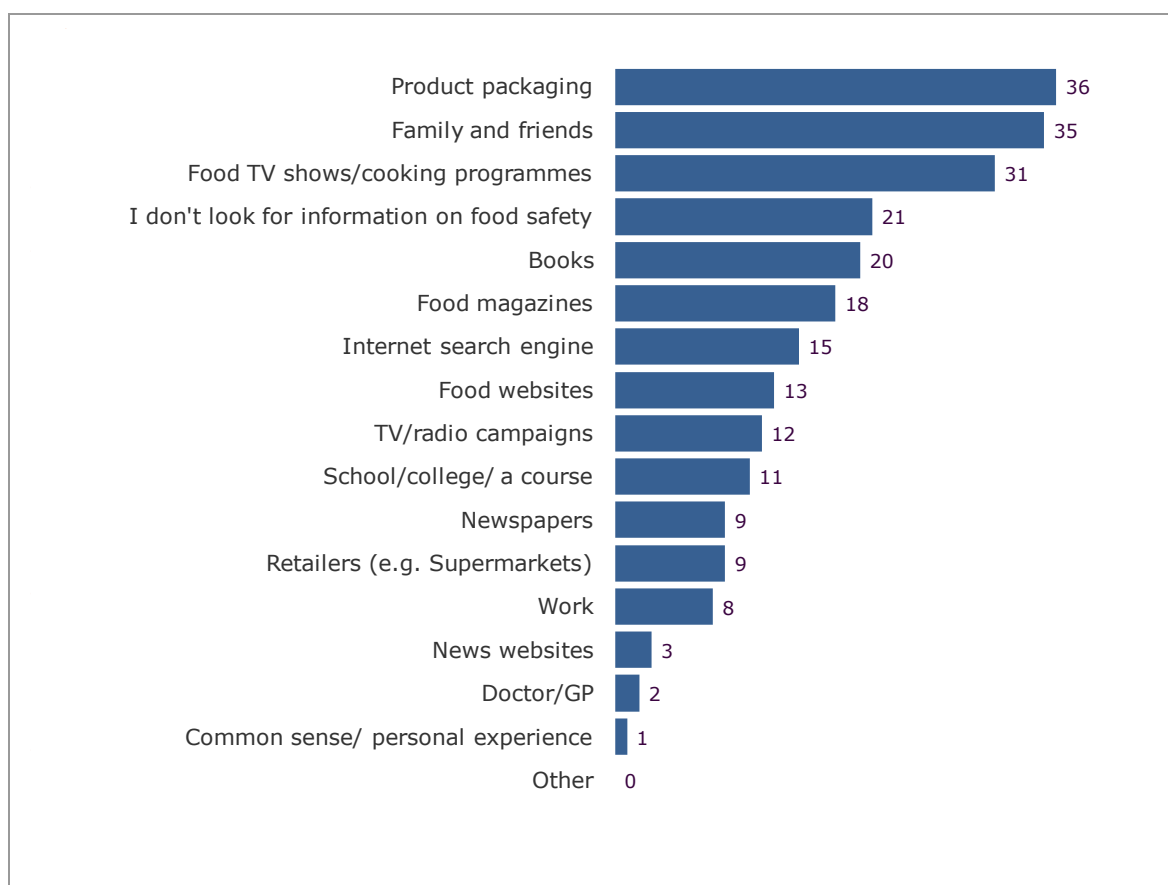
- Gender: Overall men reported less knowledge of recommended food safety guidance and their practices showed greater divergence from the '4 Cs'. In some studies this divergence was in particular related to cleanliness and fridge temperatures. Divergence was greater amongst younger and older men. However, there were some exceptions to this, for example men with training in home economics had better food safety knowledge.
- Age: while concerned about their health, older people (broadly those over 60) tended to: buy food near its use by date; use food past its use by date; keep food longer in the fridge; and have poorer refrigeration and defrosting practices. It is hard to identify any more precise patterning of practices by age in previous studies because different age cut-offs have been used and there is little differentiation between the different age cohorts in the over 60s.
- Education: the findings of previous studies are mixed, with some studies showing that the practices of those with higher levels of education diverge from recommended practices (inappropriate food storage and using foods past use by dates), but other studies finding that some food practices (specifically thawing and fridge storage) were convergent with the '4 Cs' advice. Caution is also needed here as some of the variance might be explained by whether or not the education received has included food safety.
- Household type: in single person households, particularly those of older people and men, recommended food safety practices were less likely to be followed. Conversely, in multi-person households, particularly those with (young) children and where the primary cook was a woman, food practices were more convergent with the FSA's recommendations.

²⁰ While most previous studies have examined only subsets of practices related to the '4 Cs', the Greenstreet Berman review identified a small number of studies that suggest a clustering of attitudes towards food safety generally and kitchen practices.

3.3 Sources of information on food safety at present and in the future

Respondents were asked how they gather information on preparing and cooking food safely. Thirty-six per cent said they used product packaging and a similar proportion (35%) said they used family and friends as a source. Twenty-one per cent of respondents reported they did not look for information on food safety (Figure 3.21).

Figure 3.21 Sources of information on preparing and cooking food safely (Wave 2)

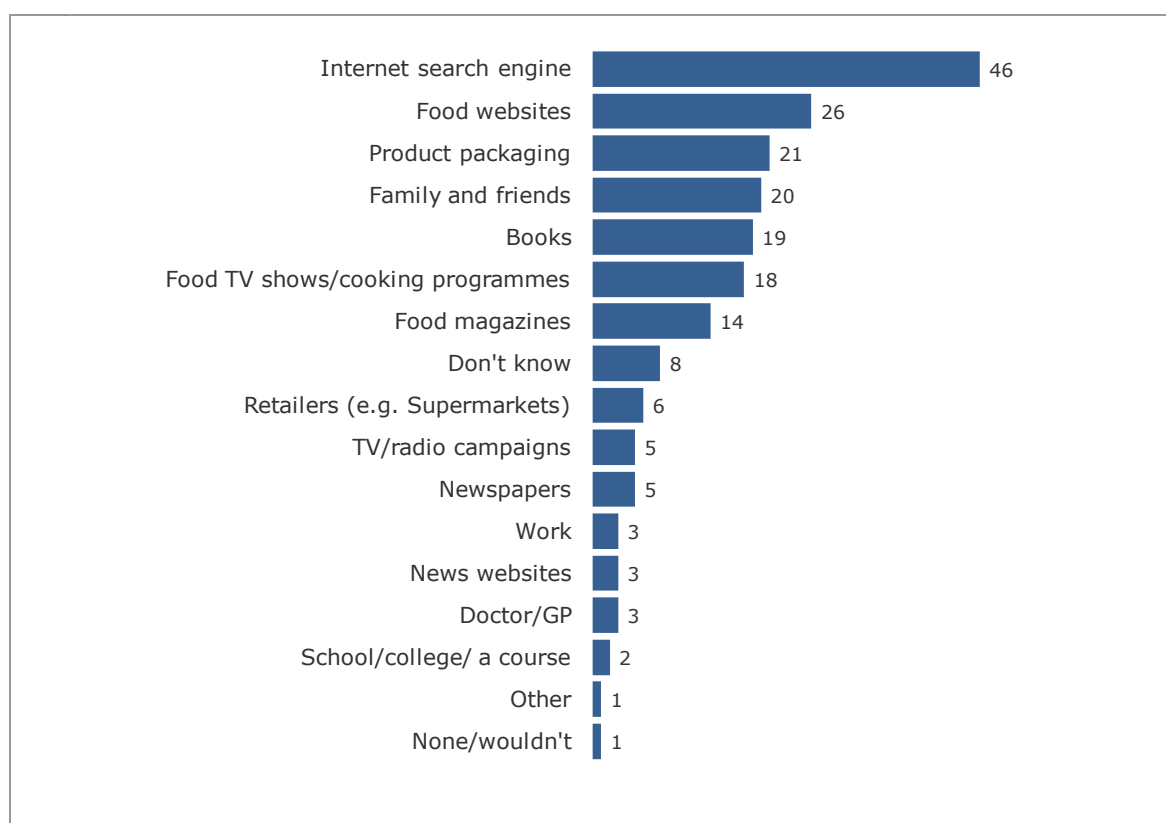


Source: Q11_8B Looking at this screen, do you get information about how to prepare and cook food safely at home from any of these sources?

Base: All respondents - Wave 2 (3231)

When asked where, if they decided to look for it, respondents would get information about safely preparing and cooking food in the future, the top two sources were different to the sources respondents reported they currently used. The most popular source for future information was an internet search engine, which was selected by 46% of respondents compared to 15% who said they currently use this source. Similarly, the proportion of respondents that said they would use food websites in the future was higher (26%) than the proportion that said they currently use them (13%) (Figure 3.22).

Figure 3.22 Future sources of information on preparing and cooking food safely (Wave 2)



Source: Q11_8C In the future if you decided to look for more information about how to prepare and cook food safely at home, where would you look for this information?
Base: All respondents - Wave 2 (3231)

3.3.1 Variation in sources of information on preparing and cooking food safely by different groups in the population

Both the reported current and future sources of information on preparing and cooking food safely were found to vary by **age**. Respondents aged 16-24 were more likely than other age groups to say they currently got information from family and friends (51% compared with 33%), the internet (27% compared with 13%) and school/college/course (26% compared with 8%). Compared with all other age groups, respondents aged 75 and over were less likely to report they would use the internet as a future source of information (9% of the 75 and over age group compared with 25% of 65-74 year olds).

Differences were also found by **ethnic group** with non-White respondents being more likely to obtain information from family and friends (44% compared with 34% of White respondents) and from school/college/course (18% and 10%). White respondents were more likely to report product packaging (38% compared with 21%), books (21% compared with 11%) and food TV shows (32% compared with 26%) as current sources of information on food safety.

4. Further analysis of food safety practices among different groups of the population

This chapter explores, in more depth, variation in reported food safety practices by different socio-demographic groups. An index of recommended practice (RP) for food safety was constructed by combining a number of food safety practices into a single composite measure. This index was then analysed to explore the characteristics of respondents who are more or less likely to follow Agency RP.

Summary

Frequency and distribution of the index

- The index is a scale from 0-10. Higher numbers indicate a lower likelihood of reporting food safety practices that are in line with Agency recommended practice (RP). A quarter (26%) of respondents were classified in the upper band of the index (5 or more on the index).
- The most common areas that respondents reported practices that were not in line with RP were use by dates (91%) and chilling (80%). Only 4% of respondents reported a practice that was not in line with RP for hand washing.

Variations in the index by socio-demographic groups

Key groups found to be *less* likely to report food safety practices in line with RP were:

- Men.
The odds of a male respondent being in the upper band of the index were 54% higher than the odds of a female respondent.
- Older respondents aged 45 and over, and in particular respondents aged 75 or older.
The odds of a respondent aged 75 or older being in the upper band of the index were 150% higher than the odds of a respondent aged 35-44. Likewise, compared with the odds of a respondent aged 35-44, the odds higher for a respondent aged 45-54 (70% higher), 55-64 (80% higher) and 65-74 (70% higher). There were no significant differences between respondents aged 35-44 and younger age groups.
- Respondents in England and Scotland.
The odds of being in the upper band of the index were 90% higher for a respondent in England, and 50% higher for a respondent in Scotland, than the odds of a respondent in Northern Ireland. Wales was not found to be significantly different from Northern Ireland.

Analysis of index bands and attitudes to food safety

- Respondents in the upper band were more likely to agree with statements that;
 - good health is just a matter of good luck (18% compared with 9% of the lower band)
 - that they could be more careful about hygiene when preparing food (39% compared with 25% of the lower band).
 - people worry too much about getting food poisoning (51% compared with 32% in the lower band)
 - a little bit of dirt won't do you any harm (65% compared with 50% in the lower band)
- Respondents in the upper band were less likely to report having seen a hygiene certificate and/or sticker in the premises of a food retailer (49% compared with 61% of the lower band) or that they had used a hygiene rating scheme before (7% compared with 12% of the lower band).

4.1 Derivation of the index of recommended practice (RP) for food safety

The index measures the extent to which reported food safety behaviour was in line with Agency recommended practice (RP). The food safety practices included in the index were selected by the FSA from all the RPs asked about in Wave 2, on the basis that if they were not followed they were most likely to increase the chance of contracting a foodborne illness. The index is a scale from 0-10, with higher numbers indicating a lower likelihood to report behaviour that was in line with Agency recommended practice. So, a score of zero would indicate that all reported food safety practices were in line with RP, while a score of 10 would indicate that all reported food safety practices were not in line with RP.

The specific food safety practices and the weighting given to them are detailed below. Further detail can also be found in the Appendix 8.2.

Chilling (+1 if any reported chilling practices were not in line with RP. Maximum +1)

- Frequency of checking fridge temperature.
- Method of checking the fridge temperature.
- Knowledge of recommended fridge temperature.

Cooking and reheating (+1 if any reported cooking practice was not in line with RP, +1 if any reheating practice was not in line with RP. Maximum +2)

- Method of checking if food is cooked properly.
- Frequency of eating chicken or turkey if the meat is pink or has pink/red juices
- Frequency of eating burgers or sausages if the meat is pink or has pink/red juices.

- Method of checking if food has been re-heated properly

Cross-contamination (+1 for each reported cross-contamination practice that was not in line with RP. Maximum +2)

- Whether different chopping boards are used for different foods
- Frequency of washing raw meat

Cleaning (+1 if any reported cleaning practice was not in line with RP. Maximum +1)

- Frequency of washing hands after handling raw meat/fish

Use by dates (+1 for each reported use by practice that was not line with RP. Maximum +4)

- Which date label indicates whether food is safe to eat
- Frequency of checking use by dates when about to cook or prepare food
- Maximum time after the use by date cooked meat would be eaten
- Maximum number of days before not eating an opened packet of sliced cooked meats, meat/fish/seafood pate, fresh dip, smoked fish, soft or cream cheese

4.2 Frequency and distribution of the index

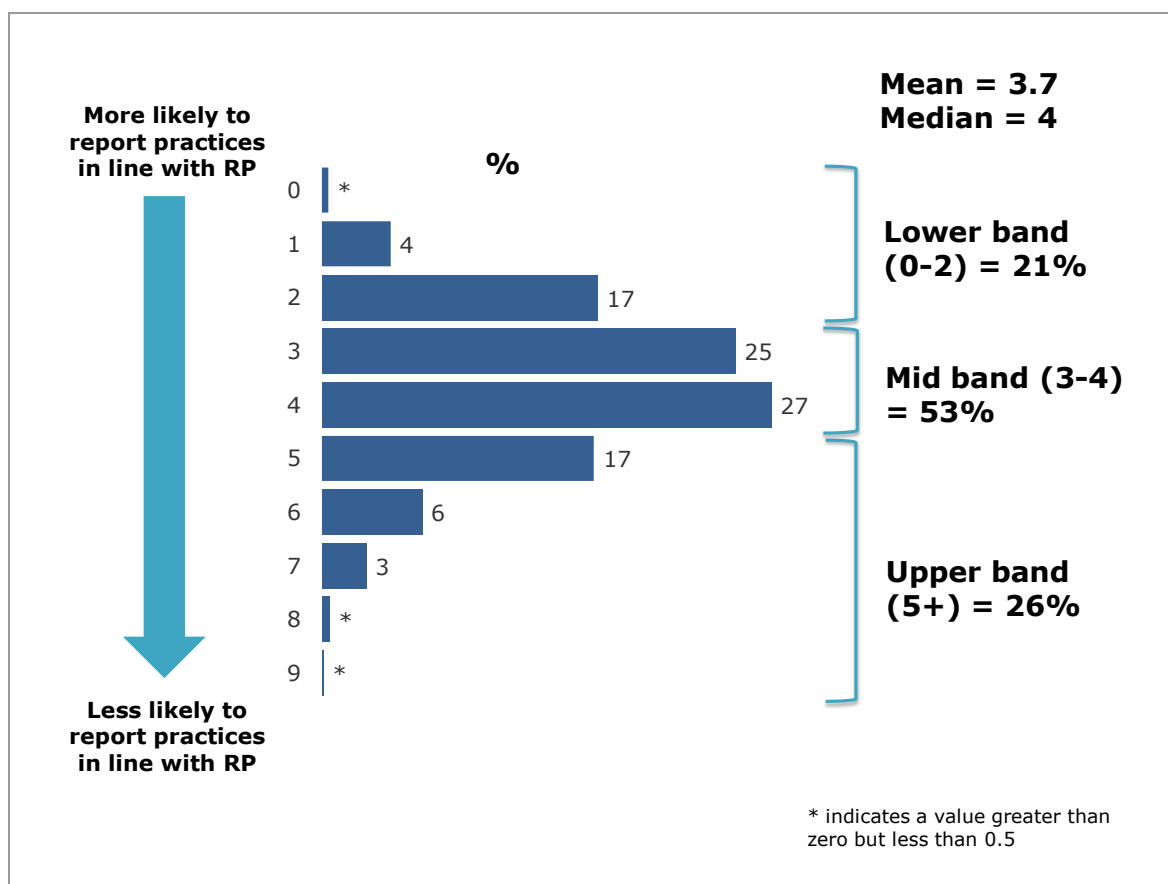
All respondents had a RP index score within the range 0-9 meaning there were no respondents who reported food safety practices that were fully not in line with RP. However, only a very small minority (0.4%) of respondents had an RP index score of 0, indicating reported practices were fully in line with RP. The median index score was 4 (mean 3.7).

Figure 4.1 shows the distribution of raw index scores, and a summary classification which categorises respondents into three bands:

- Lower band (score 0-2, most likely to report practices that are in line with RP);
- Mid band (score 3-4); and
- Upper band (score of 5+, least likely to report practices that are in line with RP).

As shown, around half were classified into the mid band, while a quarter was classified into the upper band.

Figure 4.1 Distribution of the index of RP for food safety (Wave 2)

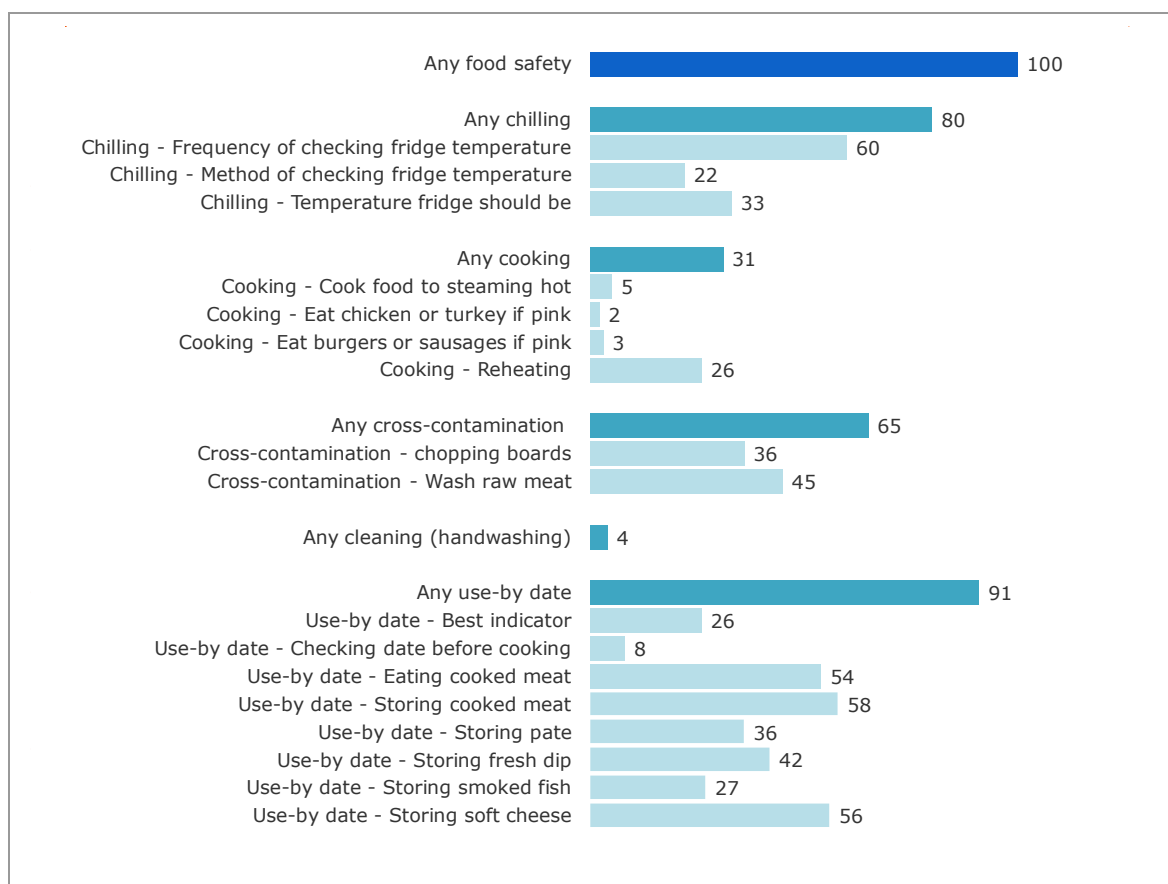


Source: Derived index of RP for food safety- explanation can be found in Section 6.3.1
Base: All respondents: (3231)

4.3 Components of the index of RP for food safety

Looking at the different components that make up the index, the most common area in which reported practice was **not** in line with RP was use by dates, with 91% of respondents reporting at least one non-RP practice in this category. The second most common area was chilling, with 80% of respondents reporting at least one chilling practice that was not in line with RP. The areas where reported practice was most in line with RP was cooking and cleaning, with only 4% of respondents reporting any cleaning practice, and 31% of respondents reporting any cooking practice, that was not in line with RP (Figure 4.2).

Figure 4.2 Percentage of respondents reporting practices that were not in line with RP by different components of the index of RP for food safety (Wave 2)



Source: Derived index of RP for food safety - explanation can be found in Section 6.3.1
Base: All respondents - (3231)

For chilling, the reported practice which was most commonly not in line with RP was frequency of checking fridge temperature (60%). For cooking, the most commonly reported practice that was not in line with RP was checking that food was properly reheated (26%). Under the cross-contamination heading, the most commonly reported practice not in line with RP was washing raw meat (45%). For the use by date component, over half of respondents reported practices that were not in line with RP in relation to eating cooked meat (54%), storing cooked meat (58%) and storing soft cheese (56%).

4.4 Introduction to the regression analysis

A logistic regression model was used to analyse the significance and contribution of a number of demographic factors to the extent in which a respondent reported food safety practices that were not in line with RP. Full model statistics are provided in Appendix 8.3.2. In this chapter, we provide a summary of the main findings²¹.

A key advantage of using regression modelling here is that it allows the examination of the impact of a single factor on the likelihood of being in the upper band of the index whilst controlling for all other factors. So, for example, although from bivariate analysis it may appear that retired respondents have a greater likelihood of being in the upper band of the index compared with employed respondents, this may be a function of age rather than employment status. By controlling for age (and other variables) we can therefore determine the isolated effect (or not) of, for example, employment status on the likelihood of being in the upper band of the index of RP for food safety.

The regression model included four demographic variables used for weighting (age, gender, country and working status), and a range of other demographic variables. The latter variables were selected because either the earlier bivariate analysis and/or supporting literature (Greenstreet Berman, 2011) suggested they might be associated with a respondent being in the upper band of the index (see Chapter 3 for more detail).

Table 4.3 below shows the summary outcomes of the regression analysis. The principal output from logistic regression is the **odds ratio**. The odds ratio indicates the size of the effect, that is, by how much a variable increases or decreases the likelihood of being in the upper band of the index compared with the reference category. If the odds ratio was **less than 1**, it means that the odds of being in the upper band of the index were lower for this category than they were for the reference category. If the odds ratio was **greater than 1**, then the odds of being in the upper band were higher for this category than for the reference category.

So, for example, Table 4.3 indicates that respondents in Scotland have an odds ratio of 1.5 which indicates that, once all factors were controlled for, they have odds of being in the upper band of the index that are 50% higher than the odds for respondents in Northern Ireland (the reference category).

Odds ratio statistics are only shown for significant subgroups in the summary table. Where data is not shown, findings were not significant (full statistics are detailed in Appendix 8.3).

²¹ Logistic regression is based on the prediction of a binary outcome. For this purpose, a summary binary variable was created based on the composite 0-10 scale index discussed in Section 4.1 above. Thus, for the purposes of the regression analysis, a respondent was classified as reporting a high number of practices which were not in line with RP if their score was in the upper band of 5 or more. This subgroup comprised 26% of the total sample.

Table 4.3 Results of regression analysis

Variable	Categories (reference category ²² in italics)	Significant (p<0.05)*	Odds ratio
Gender	<i>Women</i> Men	*	1.5
Age	<i>35-44</i> 16-24 25-34 45-54 55-64 65-74 75+	 * * * * *	 1.7 1.8 1.7 2.5
Country	<i>Northern Ireland</i> England Wales Scotland	 * *	 1.9 1.5
Working status	<i>In work</i> Retired Unemployed Other	 * 	 1.5
Ethnicity	<i>White</i> non-White	 *	 1.6
Dietary restrictions	<i>At least partly vegetarian/ vegan</i> Not vegetarian	 *	 2.2
Size of household	<i>Four</i> One Two Three Five or more	 * 	 1.5
Separate kitchen	Yes No	 *	 1.4
Tenure	<i>Owner Occupier</i> Private tenant Social tenant Rent-free	 *	 0.4
NS-SEC	<i>Lower supervisory/technical</i> Higher managerial/professional Intermediate Small employers/own account Semi-routine & routine Never worked/unemployed	 * 	 2.2

²² In calculating odds ratios, a **reference category** was selected for each variable as the category against which the odds for all other categories of that variable were compared. For example, Northern Ireland was chosen as the reference category for country, and the results of the regression modelling for this variable indicate the likelihood of those from other countries being in the upper band of the index compared to those from Northern Ireland.

The key findings from the model were as follows:

- **Gender** was found to be a significant predictor of whether or not a respondent reported food safety practices that were not in line with RP, with men having odds of being in the upper band of the index that were 54% higher than the odds for women.
- **Age** was also found to be a significant factor, with all age groups older than 35-44 being more likely to be in the upper band compared with respondents aged 35-44. In particular, respondents aged 75 or older had odds of being in the upper band of the index that were 150% higher than the odds for respondents aged 35-44. Respondents aged 45-74 had odds of being in the upper band of the index that were between 72% and 80% higher than the odds for respondents aged 35-44. Whilst those aged 16-24 and 25-34 had slightly higher odds of being in the upper band compared with 35-44 year olds the difference was not statistically significant.
- The likelihood of a respondent being in the upper band was also found to differ depending on the **country** in which they lived. Compared with respondents living in Northern Ireland, the odds of being in the upper band of the index for respondents living in England were 90% higher, and for respondents living in Scotland 50% higher. Whilst respondents in Wales were slightly more likely than respondents in Northern Ireland to be in the upper band of the index, this difference was not statistically significant.
- Looking at **working status**, the odds of being in the upper band of the index were 55% higher for unemployed respondents compared to the odds for respondents in work. However, no significant difference was found between working respondents and those who were retired or whose working status was classified as 'other'.
- By **tenure**, there was a significant difference between respondents living somewhere rent free (i.e. at a friend's or relative's house) and owner occupiers (odds of being in the upper band of the index for respondents living rent free were 40% lower than the odds for owner occupiers). However, as the sample size for rent-free respondents was small, and no other significant differences were found by tenure, this variable may not be a meaningful predictor of food safety practices.
- Other socio-demographic differences were also found to increase the likelihood of being in an upper band of the index. These were: being **non-vegetarian or vegan** (odds were 124% higher than for vegetarians/vegans); being **non-White** (odds were 60% higher than for White respondents); **not having a separate kitchen** (odds were 38% higher than for respondents with a kitchen); and belonging to a **single person**

household, or a **household with five or more people** (odds were 52% and 53% higher than a four person household).

- Although social grade is generally thought to be associated with food hygiene behaviours, this variable did not come through strongly when included in our model. The only statistically significant difference was that respondents from households where the Household Reference Person²³ was a small employer had higher odds of being in the upper band of the index (55% higher than those in the lower supervisory/technical category).
- Similarly there might have been an expectation that respondents with young children would have greater awareness of food hygiene (perhaps through information received from schools, doctors and health professionals) and therefore report food safety behaviour that was more in line with RP. There was, however, no significant difference between respondents with a child in their household and respondents with no children in their household, once all other factors were controlled for.

These findings were largely consistent with the Greenstreet Berman review (2011), with the exception of higher levels of educational achievement and income which, in Food and You, were not found to be significant predictors of whether or not a respondent reported food safety practices that were in line with RP.

4.5 Analysis of food safety index bands

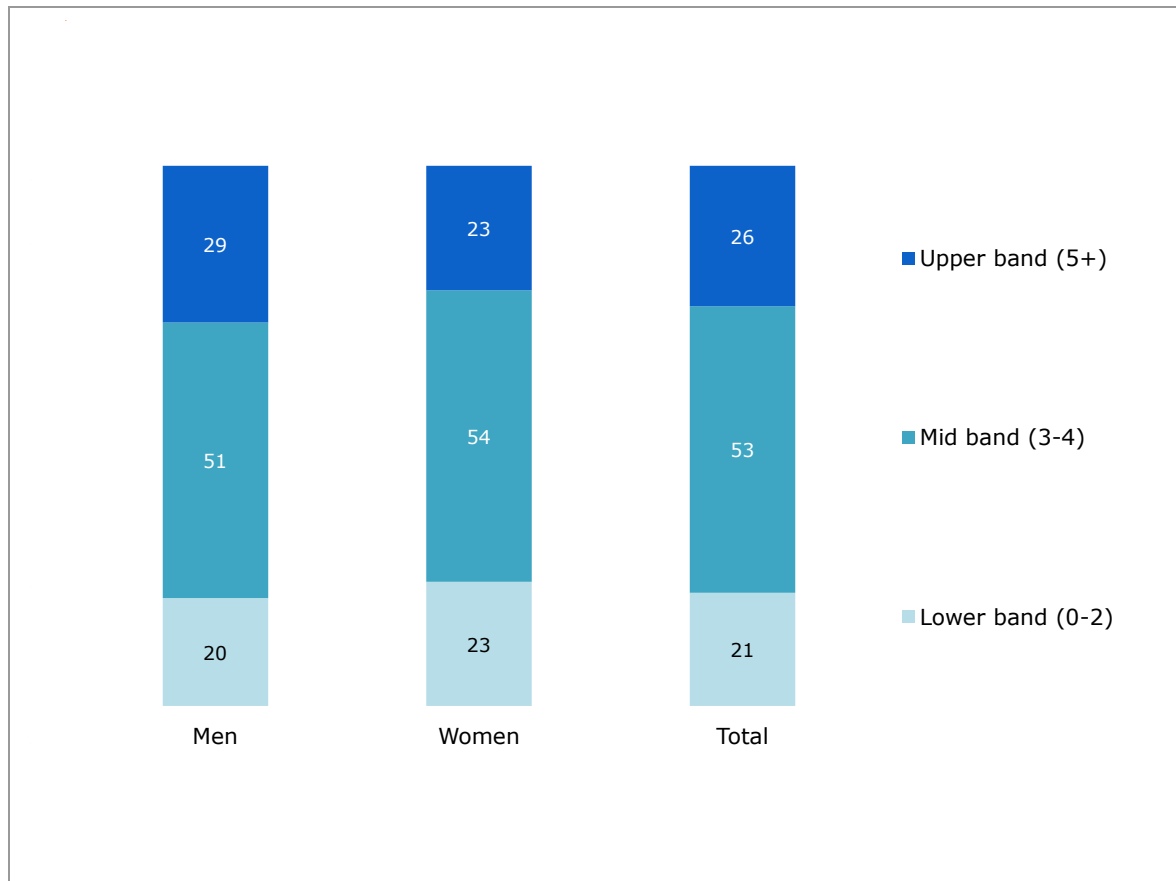
The logistic regression above provided an overview of the demographic factors most strongly related to behaviours not in line with recommended practice (RP). This showed that the three key demographic factors of gender, age and country were all associated with the likelihood of adopting behaviours not in line with RP.

This section looks at the distribution of the three index bands (upper, mid and lower) explained above in Section 4.2 by these three subgroups. As a reminder the upper band denotes those respondents who were **least** likely to follow RP, and the lower band denotes those respondents who were **most** likely to follow RP in their food safety practices.

²³ Defined as either the sole householder or, if joint householders, the person with the highest income.

By gender, men were more likely than women to be in the upper band (29% compared with 23%), as shown in Figure 4.4.

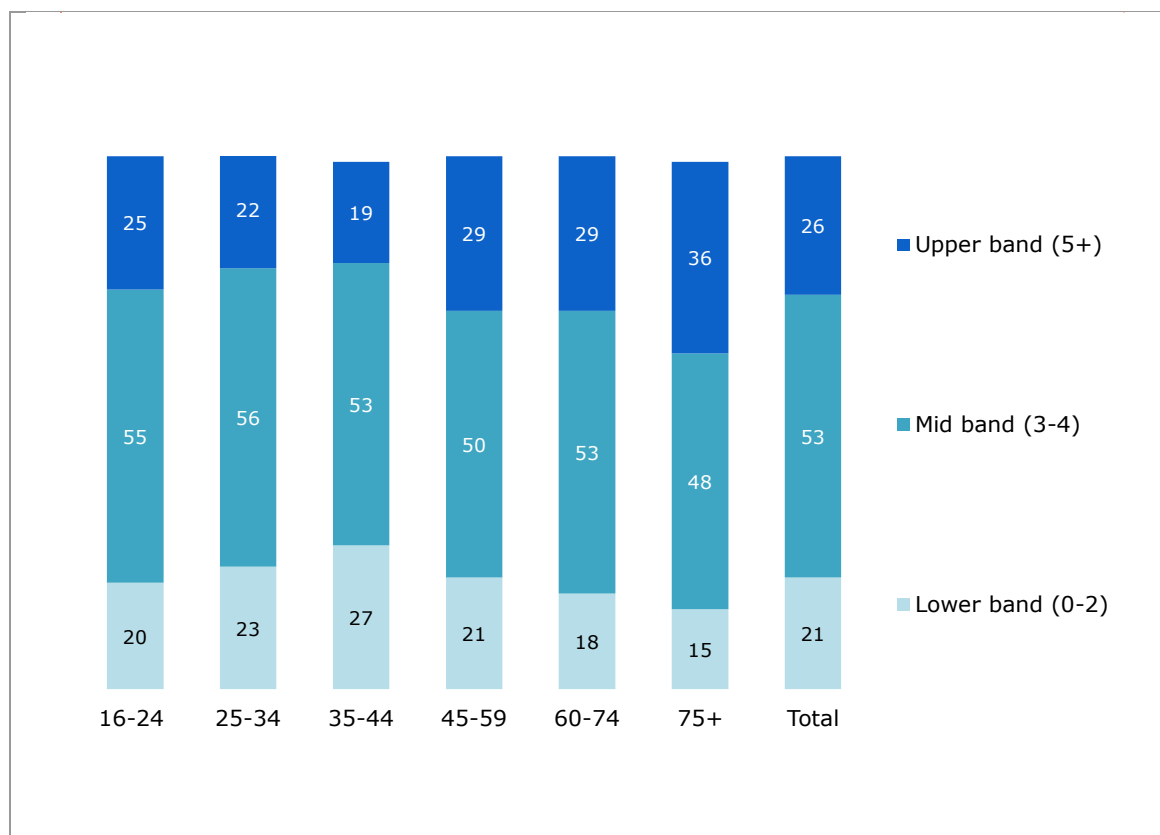
Figure 4.4 Banded index of RP for food safety by gender (Wave 2)



Source: Derived food safety index- explanation can be found in Section 6.3.1
 Base: All respondents: Men (1315); Women (1916); Total (3231)

Figure 4.5 below shows the index bands by age group. Respondents aged 35-44 had the index profile with the lowest proportion in the upper band category (19%) compared with 22% or more for other age-groups and this age group was therefore most likely to report behaviour that was in line with RP for food safety. For age groups above 35-44, the proportions of people in the upper band least likely to follow RP increased from age 45 onwards, rising to 36% among those aged 75 and over. Respondents aged 75 and over were, therefore, least likely to report behaviour that was in line with RP for food safety.

Figure 4.5 Banded index of RP for food safety by age group (Wave 2)

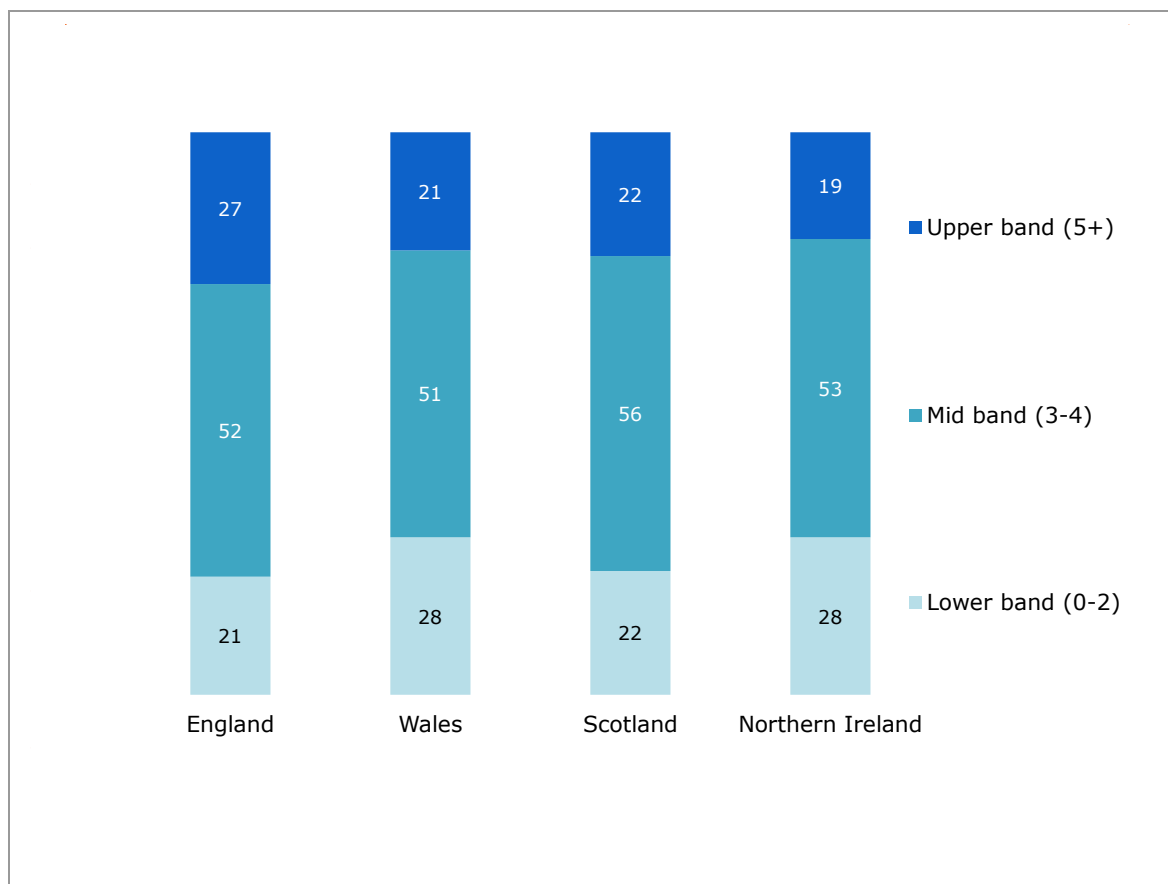


Source: Derived food safety index- explanation can be found in Section 6.3.1

Base: All respondents: 16-24 (298); 25-34 (488); 35-44 (551); 45-54 (566); 55-64 (527); 65-74 (458); 75+ (341); Total (3231)

Figure 4.6 below shows the index bands by country. Respondents in Northern Ireland (28%) were more likely than those in England (21%) and Scotland (22%) to be in the lower band and were therefore more likely to report behaviour that was in line with RP for food safety.

Figure 4.6 Banded index of RP for food safety(Wave 2)



Source: Derived food risk score- explanation can be found in Section 6.3.1

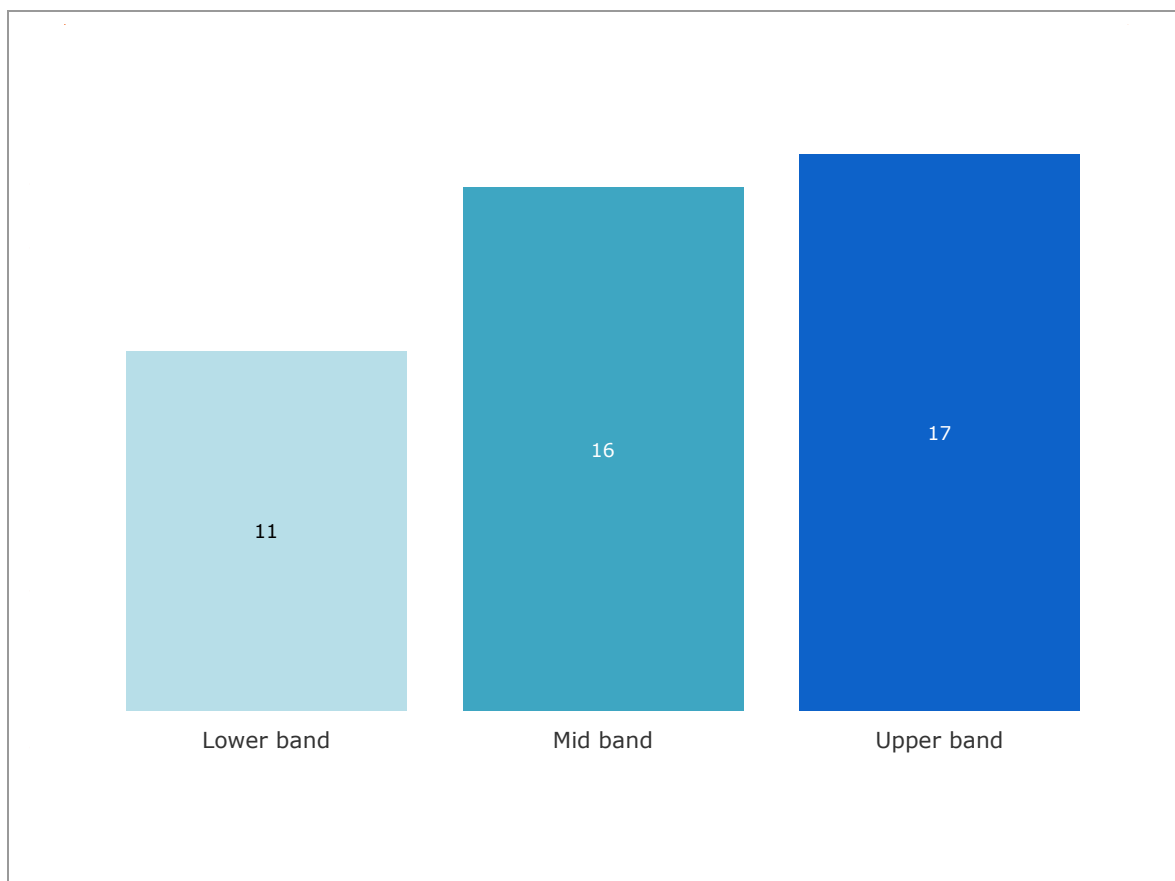
Base: All respondents: England (2116); Wales (104); Scotland (507); Northern Ireland (504)

4.6 Associations between the index of RP for food safety and attitudes and reported behaviours

In this section, the relationship between the composite food safety index score and other relevant attitudes and reported behaviours is explored. This demonstrates the different reported behaviour and attitudes of those with a higher and lower tendency to follow RP, according to the three index bands.

Figure 4.7 shows the proportion of respondents in each index band that had no responsibility for food shopping in their household. Respondents in the mid and upper bands were more likely to say they had no responsibility for grocery shopping (16% and 17% respectively) than those in the lower band (11%).

Figure 4.7 Respondents who had no responsibility for the food shop by index band (Wave 2)

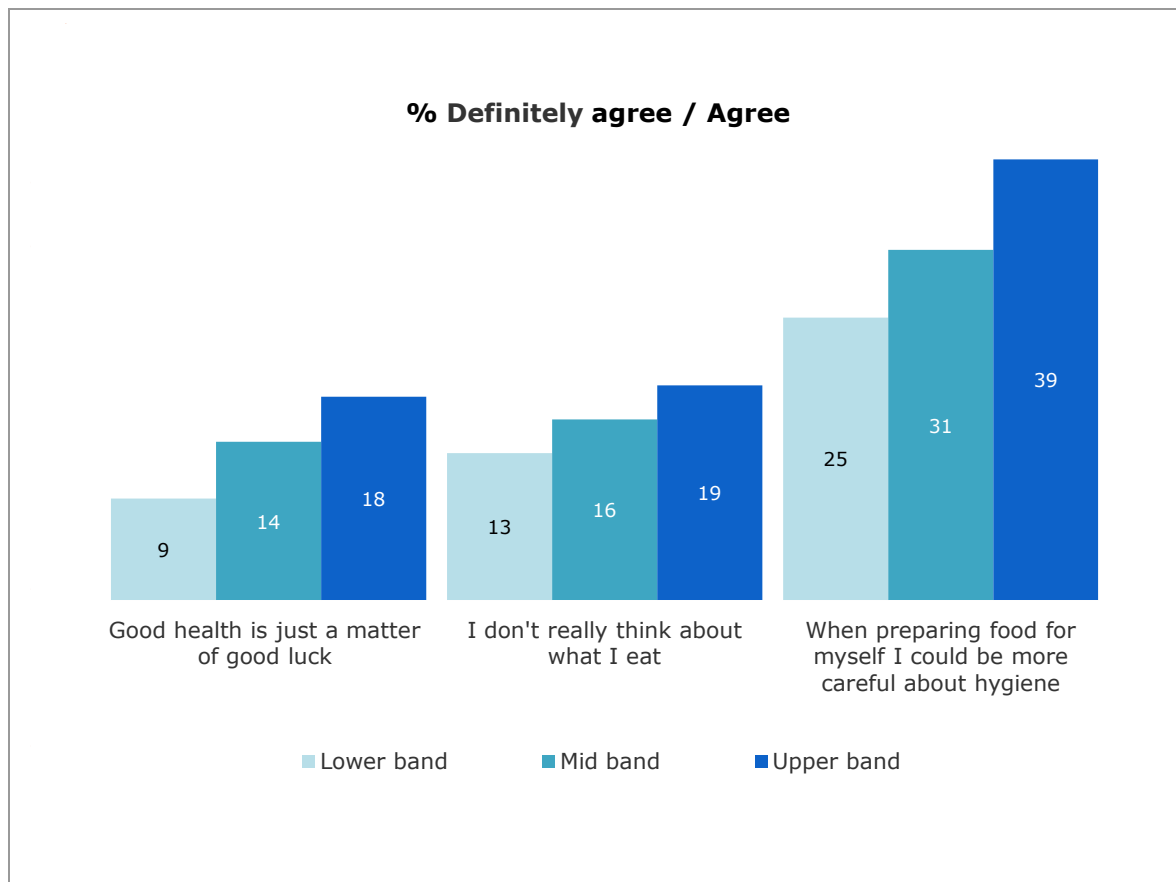


Source: Q3_1 Thinking about food/grocery shopping, which of these best describes the level of responsibility you have for the shopping in your household?

Base: All respondents – Lower band (717); Mid band (1703); Upper band (811)

When asked about their attitude towards health, respondents in the upper band (less likely to follow RP) had a greater tendency to report attitudes which suggest a more ‘relaxed’ approach to health matters. For example, 18% of those in the upper band were of the opinion that good health is a matter of good luck compared with 9% of those in the lower band. Respondents in the upper band were also more likely (39%) to acknowledge that they could be more careful about hygiene when preparing food than those in the lower band (25%) (Figure 4.8).

Figure 4.8 Attitudes towards food and health by index band (Wave 2)

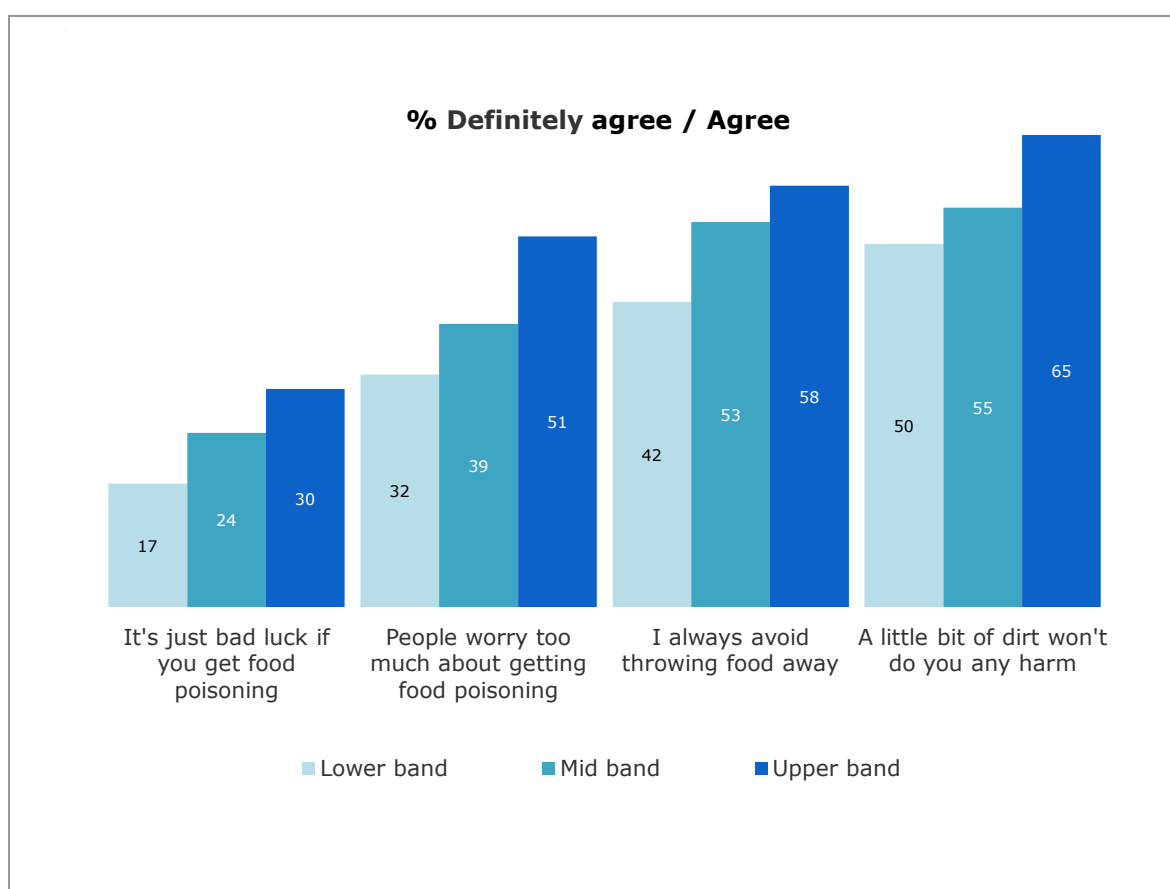


Source: Q2_16 Please tell me how much you agree or disagree with the following statements.

Base: All respondents – Lower band (717); Mid band (1703); Upper band (811)

Significant differences were also found between the index bands when analysing responses to statements about attitudes towards food poisoning (Figure 4.9). Most notably, about half (51%) of respondents in the upper bands agreed that people worry too much about food poisoning whereas about a third (32%) of those in the lower band felt the same. Furthermore, about two thirds (65%) of upper band respondents agreed that a little bit of dirt won't do you any harm, compared with half (50%) of the lower band respondents (Figure 4.9).

Figure 4.9 Attitudes towards food and health by index band (Wave 2)



Source: Q4_27 Tell me whether you agree with these statements or not.

Base: All respondents – Lower band (717); Mid band (1703); Upper band (811)

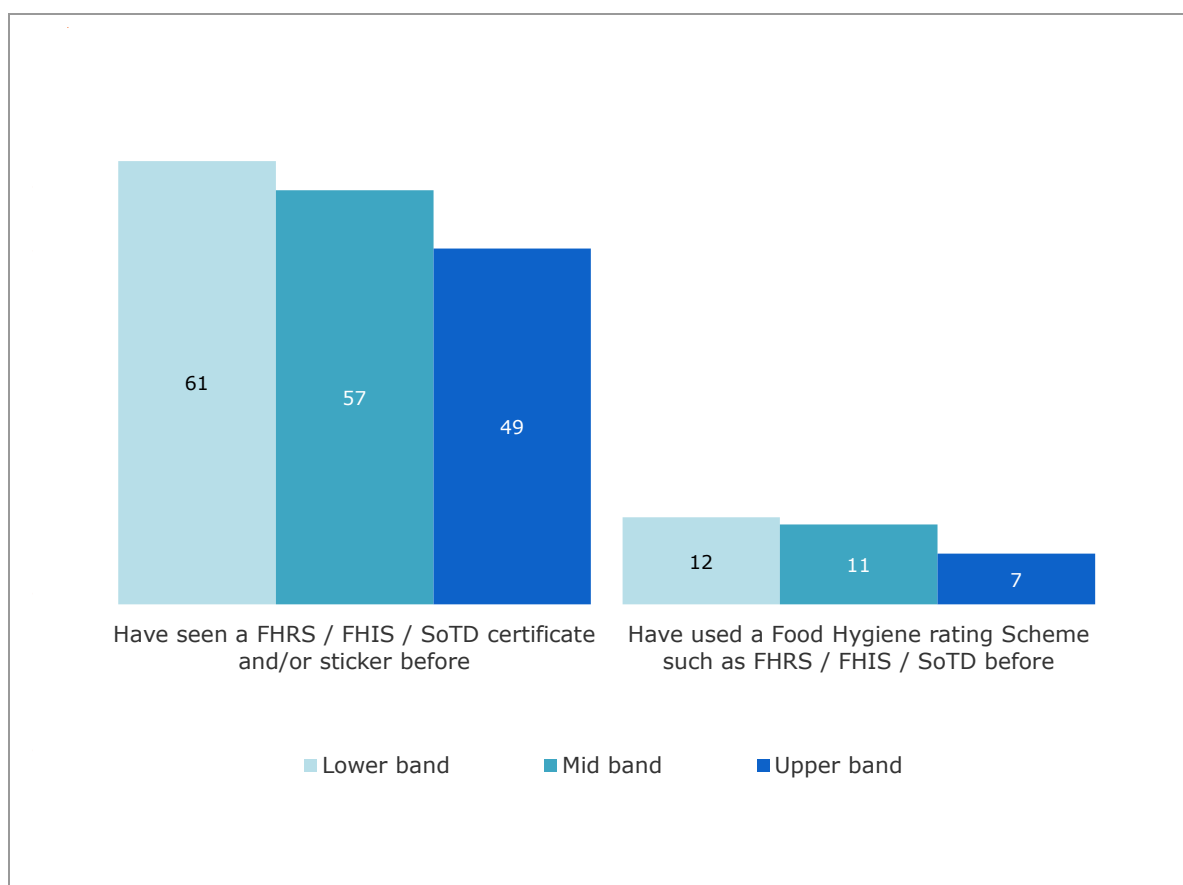
There was an association between being more likely to follow RP and awareness and use of food hygiene rating schemes (Food Hygiene Rating Scheme (FHRS), Food Hygiene Information Scheme (FHIS) and Scores on the Doors (SoTD))²⁴. Those who were in the

²⁴ The FHRS and FHIS are run by local authorities in partnership with the FSA. The schemes are designed to help consumers choose where to eat out or shop for food by giving them information about food businesses' hygiene standards. Prior to the formal launch of the FHRS in November 2010, the FSA supported a number of food hygiene rating pilots, including, the London Scores on the Doors scheme.

lower band (most likely to report practices in line with RP) were more likely than those in the upper band (least likely to report practices in line with RP) to be aware of food hygiene rating schemes.

Thus, for example, 61% of those who were in the lower band reported having seen one or more of the hygiene rating scheme certificates and/or stickers, compared with 49% of those who were in the upper band. There was also a small but statistically significant difference between the index bands in the proportion reporting having used the schemes, with 12% of those in the lower band having used them, compared with 7% of those in the upper band (Figure 4.10).

Figure 4.10 Awareness and use of food hygiene rating schemes by index band (Wave 2)

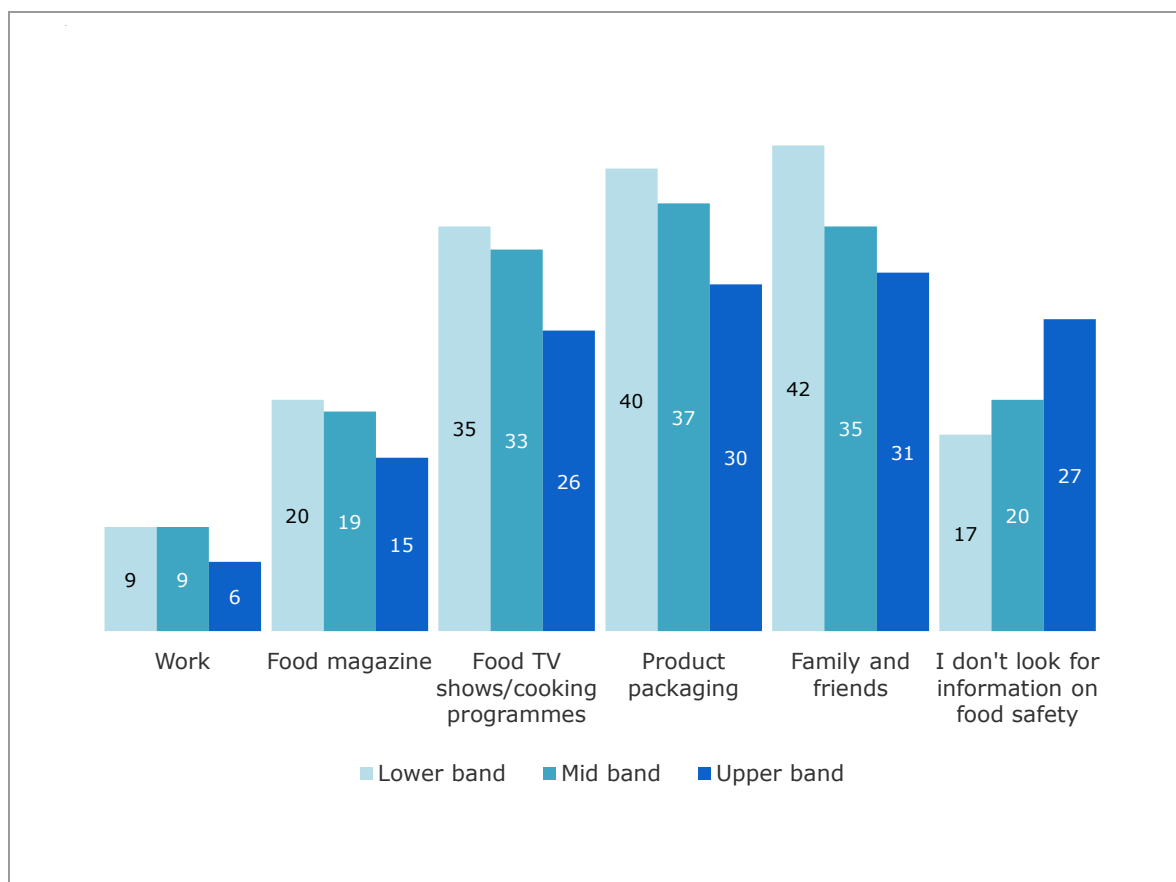


Source: Q12_1 Have you ever seen any of these before? & Q12_3 In the last 12 months, have you used a food hygiene rating scheme to check an establishment's hygiene standards before deciding to visit?

Base: All respondents – Lower band (717); Mid band (1703); Upper band (811)

Looking at reported sources of food safety information, there was an association between being less likely to report practices in line with RP and being less likely to report looking for information on food safety. Twenty-seven per cent of respondents in the upper band reported that they did not look for information on safety, compared with 17% of those in the lower band. Other differences between respondents in the lower and upper bands included seeking information from family and friends (42% of respondents in the lower band compared with 31% in the upper band) and from product packaging (40% in the lower band compared with 30% in the upper band) (Figure 4.11).

Figure 4.11 Sources of food safety information by index band (Wave 2)

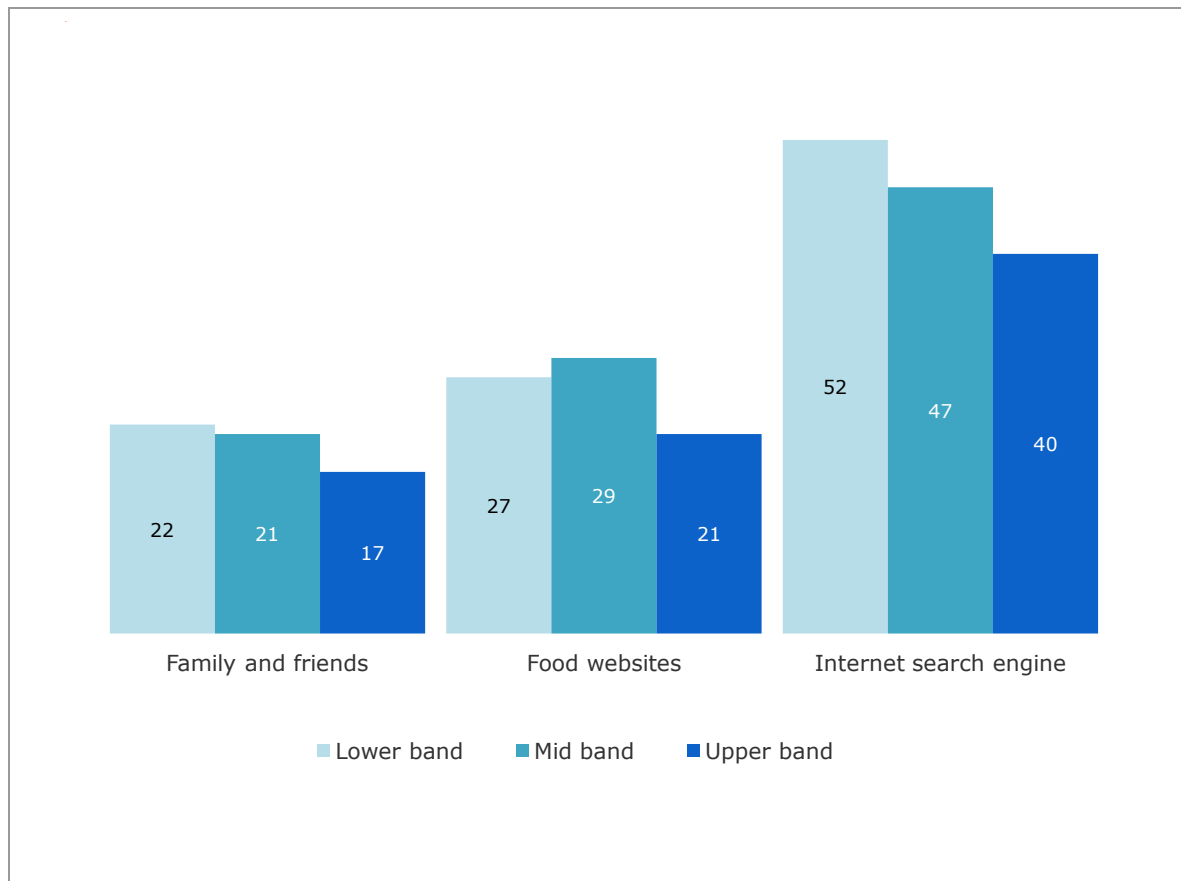


Source: Q11_8B Do you get information about how to prepare and cook food safely at home from any of these sources?

Base: All respondents – Lower band (717); Mid band (1703); Upper band (811)

Finally, with regard to future enquiries about food preparation and cooking safely, 52% of respondents in the lower band reported that they would use an internet search engine compared with 40% of respondents in the upper band. The lower band were also more likely than the upper band to say they would refer to family/friends (22% compared to 17%) and food websites (27% compared to 21%) in the future (Figure 4.12).

Figure 4.12 Future sources of food safety information by index band (Wave 2)



Source: Q11_8C In the future if you decided to look for more information about how to prepare and cook food safely at home, where would you look for this information?
Base: All respondents – Lower band (717); Mid band (1703); Upper band (811)

5. Eating outside the home

This chapter turns to practices and attitudes towards eating outside of the home, how hygiene was ranked in terms of other considerations when eating out, and awareness and use of hygiene standards rating schemes.

Summary

Frequency of eating out

- Three-quarters (75%) of respondents had eaten out in the previous seven days. This proportion had increased from 69% in Wave 1. Around one-eighth (12%) of all respondents reported that they ate out six times or more in the previous seven days; this had also increased compared to Wave 1 (8%).
- These findings contrast with the finding in Chapter 2 that, when asked about changes in eating habits for financial reasons, a greater proportion of respondents now considered they were eating in more, and eating out less, compared to six months ago.

Awareness of hygiene standards when eating out

- Half of respondents (48%) felt the food was less safe when eating out compared with eating at home with only 6% reporting that they felt the reverse was true. Forty-two per cent of respondents reported that they felt there was no difference.
- Over two-thirds (69%) said that cleanliness and hygiene was a consideration when deciding where to eat out. This has increased compared to Wave 1 (63%). Other important factors were service (63%) and price (54%), both of which have increased compared to Wave 1 (54% and 45% respectively). A quarter (26%) of respondents said that a good a hygiene rating or score was important when deciding where to eat out.
- Just under three-quarters (72%) of respondents said that they were aware of standards of hygiene when eating out.
- Asked how they know about the hygiene standards of places they eat out at or buy food from, respondents were most likely say the general appearance of the premises (63%) and appearance of staff (47%). Just under a quarter (23%) of respondents said they know about hygiene standards from a hygiene certificate (a decrease compared to 28% in Wave 1) and 13% said a hygiene sticker (an increase compared to 9% in Wave 1)

Awareness of Food Hygiene Rating Scheme (FHRS)/ Food Hygiene Information Scheme (FHIS)

- One-third (34%) of respondents in England, Wales and Northern Ireland reported having seen a FHRS certificate and/or sticker before. Awareness of the FHRS was highest among respondents from Northern Ireland (66%), where a public information campaign of the FHRS had been carried out.
- 44% of respondents in Scotland reported having seen the FHIS certificate and/or sticker before.
- Respondents who said they had seen a FHRS / FHIS sticker and / or certificate were most likely to have seen it on the window or door of an establishment (84% of respondents in England, Wales and Northern Ireland reported seeing the FHRS, and 88% of respondents in Scotland reported seeing the FHIS, on a window or door).
- One in ten (10%) said they had used a scheme when deciding whether to eat at a food establishment, most of whom (92%) found it helpful.

5.1 Background

Eating out encompasses a broad range of practices and relates to a variety of locations, motivations and implications. Eating out may be for convenience, for entertainment or as a means to display 'cultural capital'²⁵ (Bourdieu, 1984; Warde and Martens, 2000). It may involve snacking, the eating of street food or consumption of a full meal – all from a wide variety of potential venues. The definition of eating out in the Food and You survey encompasses a wide range of establishments: restaurants, pubs, cafés or coffee shops, sandwich bars, fast food, work canteens, leisure facilities such as cinemas, bowling alleys or theme parks, and takeaway food (e.g. Indian/Chinese/Pizza/Fish and chips).

5.1.1 Trends

While there has been much discussion on the growth of eating out and the expansion of the catering industry, eating out is not a modern phenomenon, dating back to the Middle Ages. The origins of modern, global, fast-food consumption date back to the 1950s with the emergence of fast-food outlets. Oddy (2003) identifies the 1970s in Britain as a critical turning point in eating out practices, characterized by reductions in eating in institutional settings such as work canteens and schools but accompanied by increases in the incidence of eating in commercial venues (restaurants, pubs, fast-food outlets etc). Between 1975 and 1984, take-away meals rose from 14% to 27% of all meals eaten.

²⁵ Cultural capital is defined as a form of knowledge that has value in a given society in relation to status and power.

Nowadays, on average one in every six meals in the UK is consumed outside the home, making these meals an important part of our diet. Food consumed outside of the home can represent up to 20-25% of calories eaten (Bates et al, 2010; Department for Environment Food and Rural Affairs, 2007). A wide range of determinants have driven these trends including: increasing affluence, greater spatial mobility, increased labour market participation of women and food technology developments, including the ability to separate the location of food production and consumption²⁶.

Cheng et al's (2007) time use study observes an increase in the amount of time allocated to eating and drinking away from home. With the growth in the range and number of 'fast food' outlets and of eating out, food hygiene and safety among food business operators have become increasingly important.

5.1.2 Food hygiene rating schemes

The FSA's strategic objective is safer food for the nation and a key element in achieving this is the Food Hygiene Rating Scheme (FHRS) for England, Wales and Northern Ireland and the Food Hygiene Information Scheme (FHIS) for Scotland.

The schemes, which are being introduced in partnership with local authorities, are designed to help consumers choose where to eat out or shop for food by giving them information about the hygiene standards of food premises at the time they were inspected to check compliance with legal requirements. They are also intended to encourage food businesses to improve their standards. FHRS ratings / FHIS inspection results are published at www.food.gov.uk/ratings and businesses are given stickers / certificates and encouraged –though not currently required - to display these where their customers can easily see them²⁷. Prior to the formal launch of the FHRS / FHIS in November 2010, the FSA supported a number of food hygiene rating pilots, including the London Scores on the Doors scheme (SoTD).

Studies of a number of schemes adopted in the USA, Canada, and Denmark and New Zealand have found that providing the public with hygiene ratings is welcomed by consumers and can lead to improved standards of food safety and better sales²⁸. Denmark

²⁶ This separation is possible by means of food preservation techniques such as canning, pre-cooking, freezing and dehydration of food which can then be re-assembled and re-heating as a meal in a variety of locations (Hartog, 2003)

²⁷ Display of stickers at food business premises in Wales will be mandatory once the provisions of the Food Hygiene Rating (Wales) Act 2013 come into force – this is expected to be late in 2013.

²⁸ Basrur, S. (2003) Evaluation of the Food Premises Inspection and Disclosure System available at <http://www.toronto.ca/legdocs/2003/agendas/committees/hl/hl030127/it004.pdf>; <http://www.legco.gov.hk/yr07-08/english/sec/library/0708in19-e.pdf>; <http://www.findsmiley.dk/en-US/Forside.htm>; Morris, J. (2005) Publication of hygiene inspection information, CIEH; Farley, T (2011) Restaurant Letter Grading: the first 6 months, NYC Department of Health and Mental Hygiene; Zhe Jin, G. and Leslie, P. (2003) The effect of information on product quality: evidence from restaurant hygiene grade cards. *The Quarterly Journal of Economics*, 409-451.

is the only European Union country where the display of ratings at the entrance to food business premises and on business homepages is a legal requirement. Studies of the Danish scheme have found that consumer awareness is very high and that consumers are making informed choices based on publicised food business hygiene standards. Studies of mandatory schemes such as the Dine Safe in Toronto, Canada and the Los Angeles County (USA) grade card initiative indicate an increase in food business compliance as well as raised consumer awareness of food hygiene standards. An impact study of the Los Angeles County scheme attributed a decrease in food-borne illness to the grade card scheme.

A full evaluation of the FHRS / FHIS has been commissioned by the Agency and is currently underway²⁹.

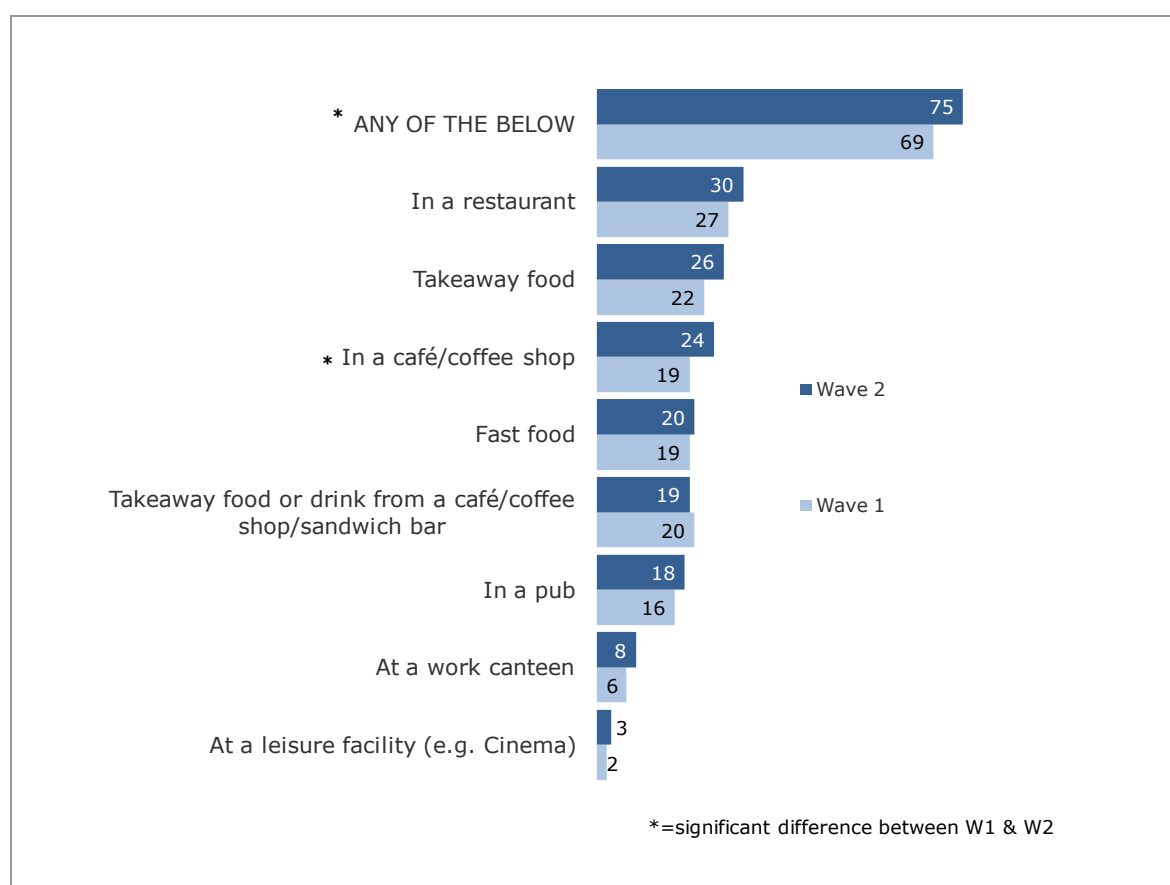
²⁹ The full evaluation of the FHRS focuses on various impact and process strands, including: uptake of the FHRS and FHIS by Local Authorities; businesses' understanding of, and response to, the FHRS and FHIS; and the impact of the FHRS and FHIS on consumer practice.

5.2 Frequency of eating out

Three-quarters (75%) of respondents reported that they had eaten out in the previous seven days, an increase in comparison to Wave 1 (69%).

The type of establishments respondents most frequently reported eating out at over the previous seven days were restaurants (30%), take-away food outlets (26%) and cafes / coffee shops (24%). The proportion of respondents who reported eating in a cafe / coffee shop has increased slightly compared to Wave 1 (19%). See Figure 5.1 for more detail.

Figure 5.1 Eating out behaviour in the last 7 days: prevalence of eating at different establishments (Wave 1 and Wave 2)

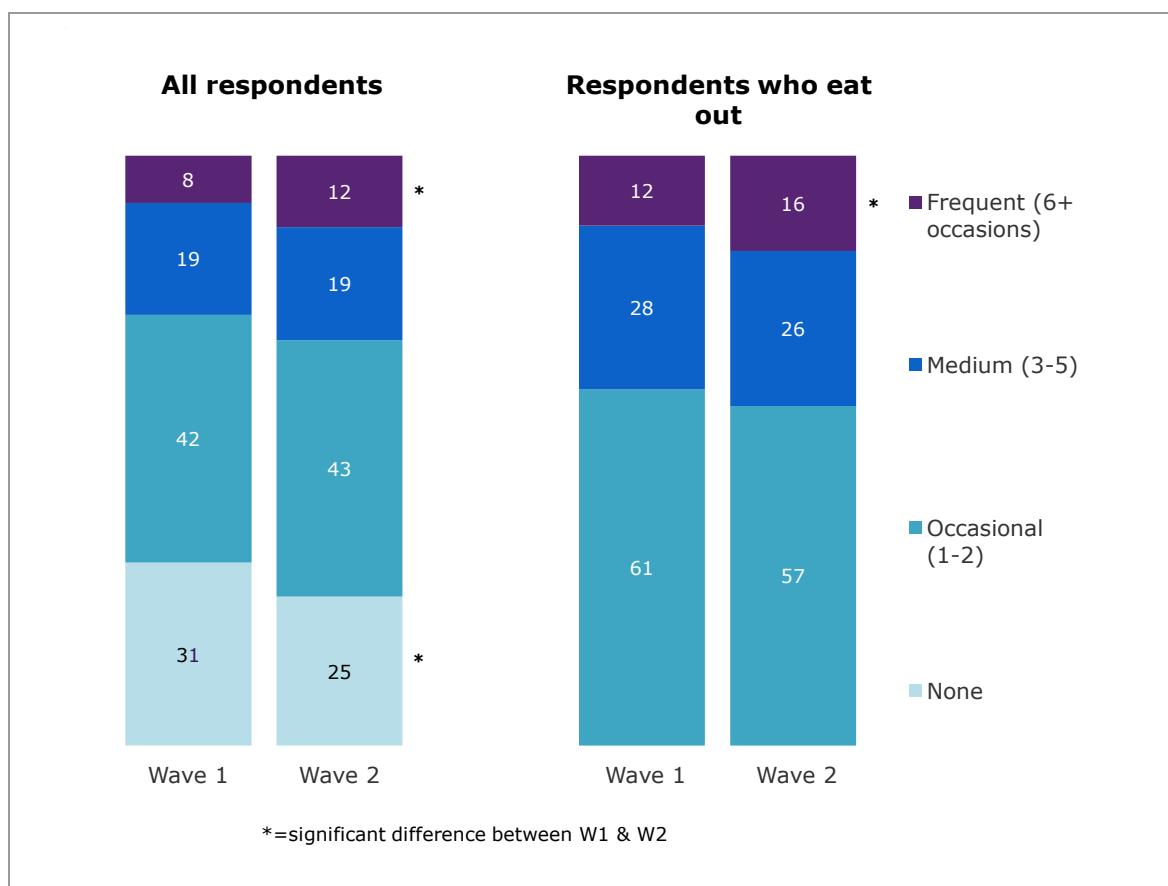


Source: Q2_33 Have you done any of the following things in the last 7 days, that is since last ...

Base: One third of total sample – Wave 1(1056); All respondents - Wave 2 (3231)

Frequency of eating out has also increased compared to Wave 1, with 12% of respondents now classified as frequent (eaten out on at least six occasions in previous week) consumers of meals outside the home compared to 8% at Wave 1 (Figure 5.2).

Figure 5.2 Eating out behaviour in the last 7 days: frequency of eating out overall (Wave 1 and Wave 2)



Source: Q2_34 How many times have you eaten in a... in the last seven days?

Base: All respondents – Wave 1 (one third of the sample) (1056); All respondents - Wave 2 (3231); All respondents that eat out – Wave 1 (733); Wave 2 (2270)

The increase in the proportion of respondents and the frequency of eating out between Wave 1 and Wave 2 of Food and You is consistent with the upward trend found in previous research. However, there appears to be some contradictions in the Food and You findings when comparing the reported frequency and prevalence of eating in the home against eating out. In Section 2.3, one-quarter (24%) of respondents reported they had been eating at home more over the previous 6 months as a result of financial concerns; furthermore, 21% said they were reducing takeaway consumption and 17% were increasing preparation of packed lunches at home. Yet, findings in this chapter show that, compared with two years ago, a greater proportion of respondents reported having eaten out in the previous week. One possible cause of this discrepancy could be that the time frames differed between the two questions (past week compared with past six months)

which may affect levels of recall. There may also be an element of bias introduced into the question about changes to eating patterns for financial reasons with respondents more likely to overstate or perceive they have made more changes than they actually have.

5.2.1 Variation in frequency of eating out by different groups in the population

Eating out behaviour varied according to respondent's characteristics in the following ways:

Age was a factor, with younger respondents being more likely to eat out. Most (90%) of 16-34s ate out; for other age groups the proportion eating out declined steadily, decreasing to 49% of those aged 75 and over. This difference was particularly pronounced for consumption of food from takeaway and fast-food outlets, with younger people aged 16-34 particularly likely to report having consumed take-away and fast food in the last seven days (38% compared with 21% for takeaways and 37% compared with 12% for fast food).

Respondents with **children under 16** were also more likely to report eating out than respondents who did not have children under 16 living in the household (81% compared with 72%).

Significant variation was also observed by **household income** and **employment** status. Respondents with higher incomes were more likely to report eating out compared with households on lower incomes (83% of respondents with annual household incomes of at least £52,000 did so compared with 59% of respondents with incomes of less than £10,400). This was the case across all types of outlet, although the difference was most marked for eating in a restaurant (42% compared with 17%). Full-time workers were more likely to report eating out than other respondents (83% compared with 60% of people who were unemployed or retired and 76% of part-time workers).

Finally, **level of education** was associated with some variation in frequency of eating out with respondents with higher levels of education being more likely to report eating out (84% of those educated to at least degree level compared with 55% of those with below-GCSE level qualifications or none).

These patterns mirror the differences in reported frequency of eating at home (Section 2.1) where it was found that eating at home on a regular basis was more likely to be associated with older respondents (aged 65 and over), lower incomes (of less than £10,400), lower levels of education (GCSE level or none) and those who were retired and unemployed. Conversely, respondents who were younger, had higher incomes, had higher levels of education and worked full-time were less likely to eat at home.

The findings are also consistent with previous research which shows that, despite gender and class inequality in eating out reducing over time (Burnett, 1989), class differences are

still evident. Age has also been identified as strongly associated with eating out, particularly in relation to the consumption of fast food. So, whilst Heald (1987) found that the growth in fast food between 1975 and 1984 was associated largely with eating practices among 'lower social classes', by the 1990s, eating fast food was found to be mainly associated not with income or class but with age, with younger people notably more likely to have frequented a fast food premise in the previous year (Warde and Martens, 2000).

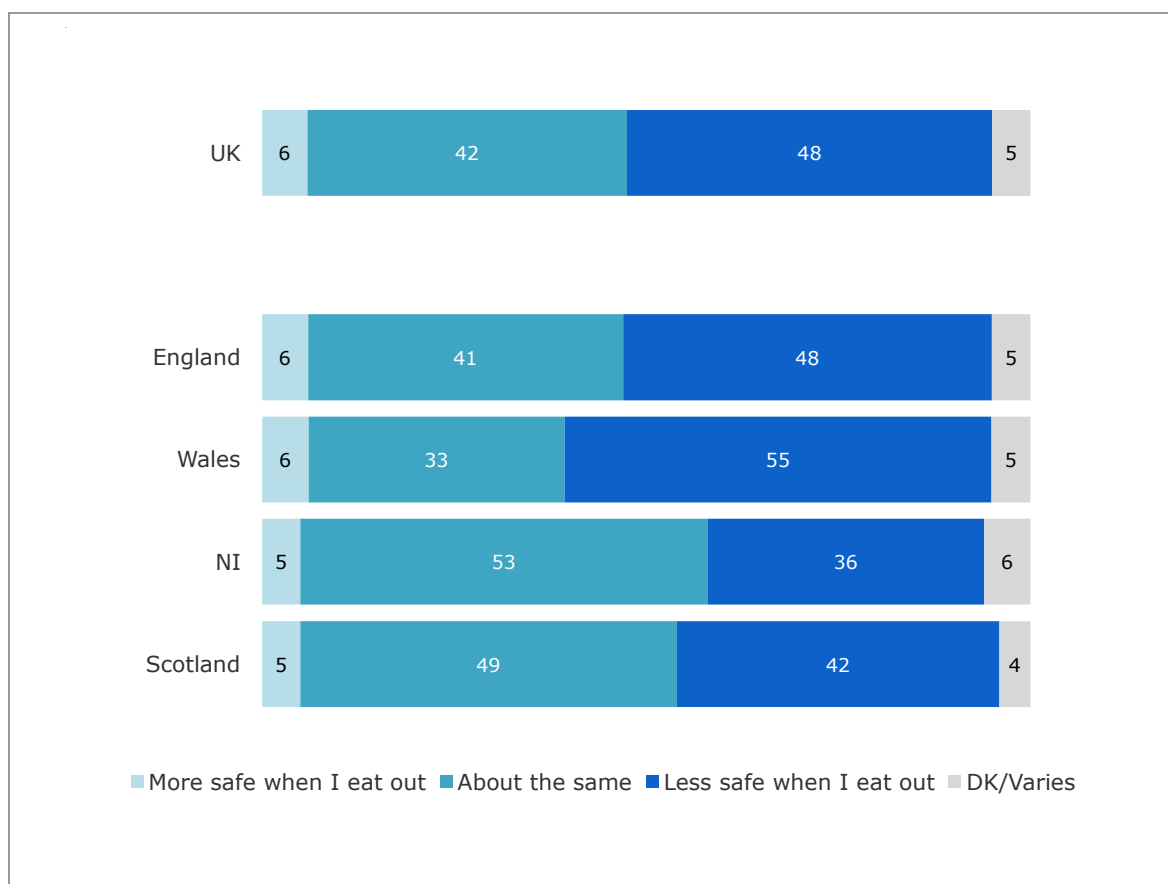
Warde and Marten (2000) also note that frequency of eating out is positively associated with several socio-demographic factors, in particular: higher income, higher educational levels, and being in full-time employment. However, whilst in the late 1990s, Warde and Marten found the frequency of eating out to be associated with being single and not having dependent children this was generally not found in Food and You in 2010 or 2012. For instance, the proportion of single respondents and respondents living in a couple reporting they ate out in the past seven days is not significantly different (74% and 75% respectively). However, whilst differences were not observed at the total level, there were some differences when looking at establishment type. For instance, single respondents were found to be more likely to have eaten fast food (23% compared with 17% of those living in a couple) and to have bought food from a café (22% and 17%) in the last seven days. Those with a child aged under 6 in their household were found to have different eating out habits to those without; for instance, they were more likely to have eaten a takeaway (40% compared with 24%) and less likely to have eaten at a restaurant (23% and 31%).

5.3 Perception of food safety and hygiene when eating out

Respondents (aside from those who said that they never eat out) were asked how safe they considered food to be when eating out compared with eating at home. Just under half (48%) of respondents felt food was less safe when eating out compared with eating at home and only 6% considered food to be safer when eating out. Two in five (42%) said that there was no difference.

There was little variation between countries in the proportion of respondents who reported food was safer when eating out compared to eating at home. However, Welsh respondents were less likely to say that there was no difference (33%) and more likely to say that food was less safe when eating out (55%). Conversely, Northern Irish respondents were more likely to say there was no difference (52%) and less likely to say that food is less safe when eating out (36%).

Figure 5.3 Perception of food safety when eating out compared with eating at home by country (Wave 2)



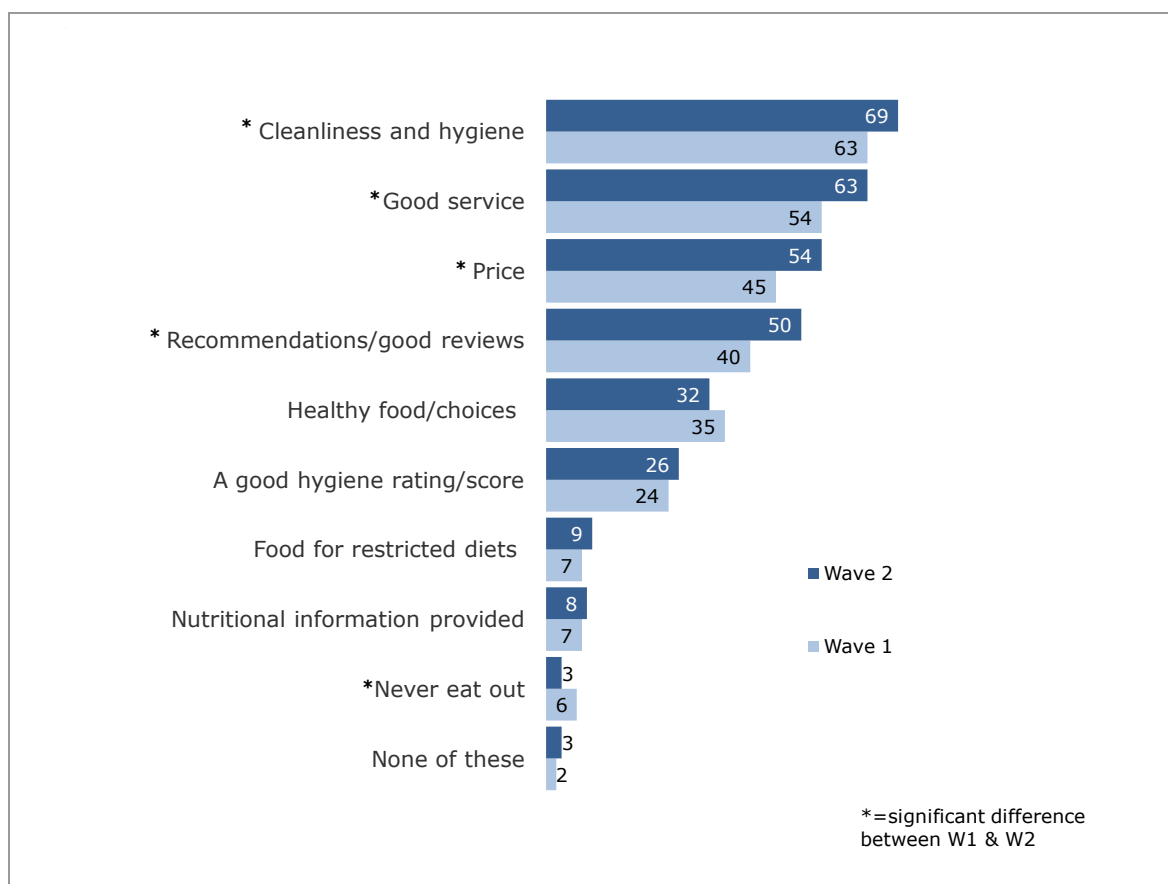
Source: Q2_39 When you eat out, how safe would you say the food that you eat is, compared to when you eat at home?

Base: All respondents who eat out- England (2032); Wales (98); Scotland (485); NI (482); UK (3097)

Respondents were shown a list of factors which might affect their choice of where to eat out or to purchase take-away food and were asked to select those they considered important. While 69% said that cleanliness and hygiene was a factor when deciding where to eat out, service (63%) and price (54%) were also prevalent deciding factors. The consideration of a good hygiene rating score was cited by 26% when eating out (Figure 5.4).

Between Wave 1 and Wave 2, there has been an increase in the proportion of respondents mentioning general cleanliness and hygiene (69% in Wave 2 compared with 63% in Wave 1). Increases were also seen in the proportion of respondents who cited service (up by 9%), price (up by 9%) and recommendations (up by 10%) as important factors when deciding where to eat out.

Figure 5.4 Importance of factors in deciding where to eat out (Wave 1 and Wave 2)

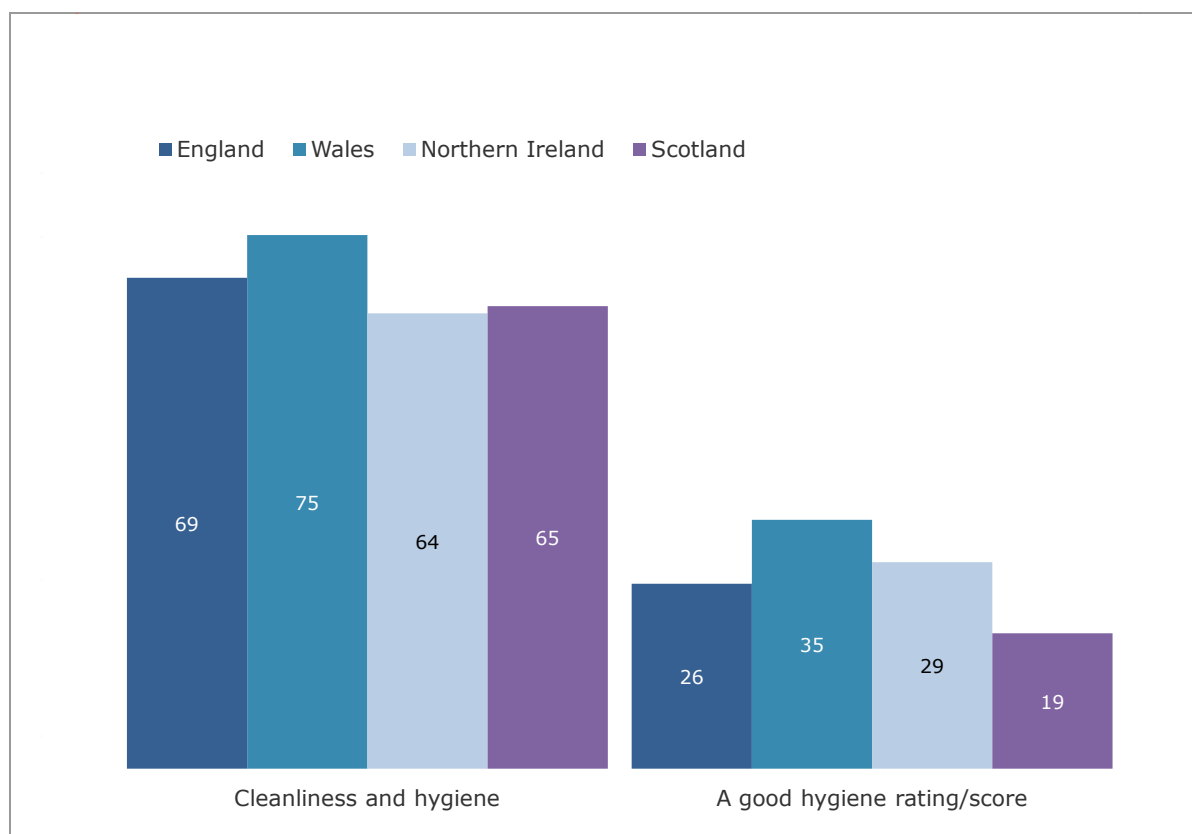


Source: Q2_35 Generally, when you're deciding where to eat out, which of the following are important to you?

Base: One third of total sample – Wave 1 (1056); All respondents – Wave 2 (3231)

Respondents in Wales were more likely than those in the rest of the UK to mention both general hygiene/cleanliness (75%) and hygiene ratings (69%) as factors behind decisions on where to eat out (compared with 69% and 26% respectively in England). See Figure 5.6 below.

Figure 5.6 Importance of hygiene standards when eating out by country (Wave 2)

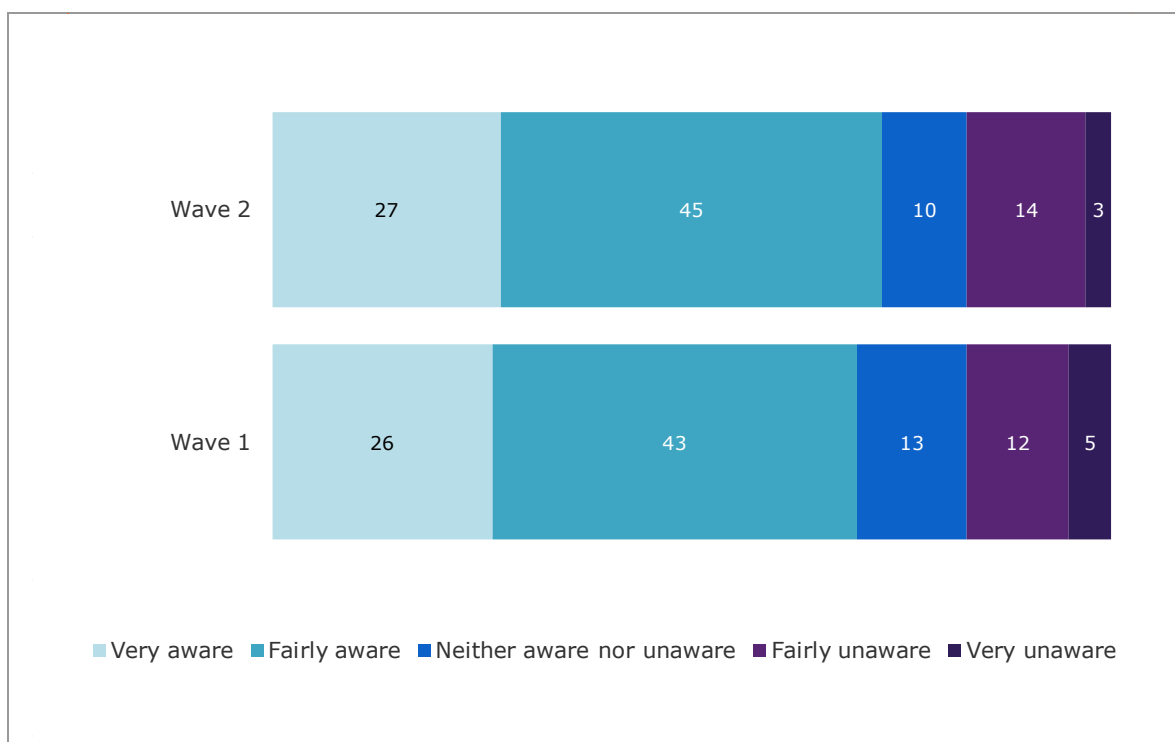


Source: Q2_35 Generally, when you're deciding where to eat out, which of the following are important to you? & Q2_37 When you eat out, how aware would you say you generally are about standards of hygiene?

Base: All respondents – England (2116); Wales (104); Scotland (507); NI (504); All respondents who eat out – England (2032); Wales (98); Scotland (485); NI (482)

Respondents were then asked how aware they are of hygiene standards when eating out or purchasing takeaway food. Twenty-seven per cent of respondents stated that they were very aware and 45% stated that they were fairly aware of standards of hygiene when eating out or purchasing takeaway food. These figures are not significantly different from those reported in Wave 1 (Figure 5.5 below).

Figure 5.5 Awareness of hygiene standards when eating out (Wave 1 and Wave 2)

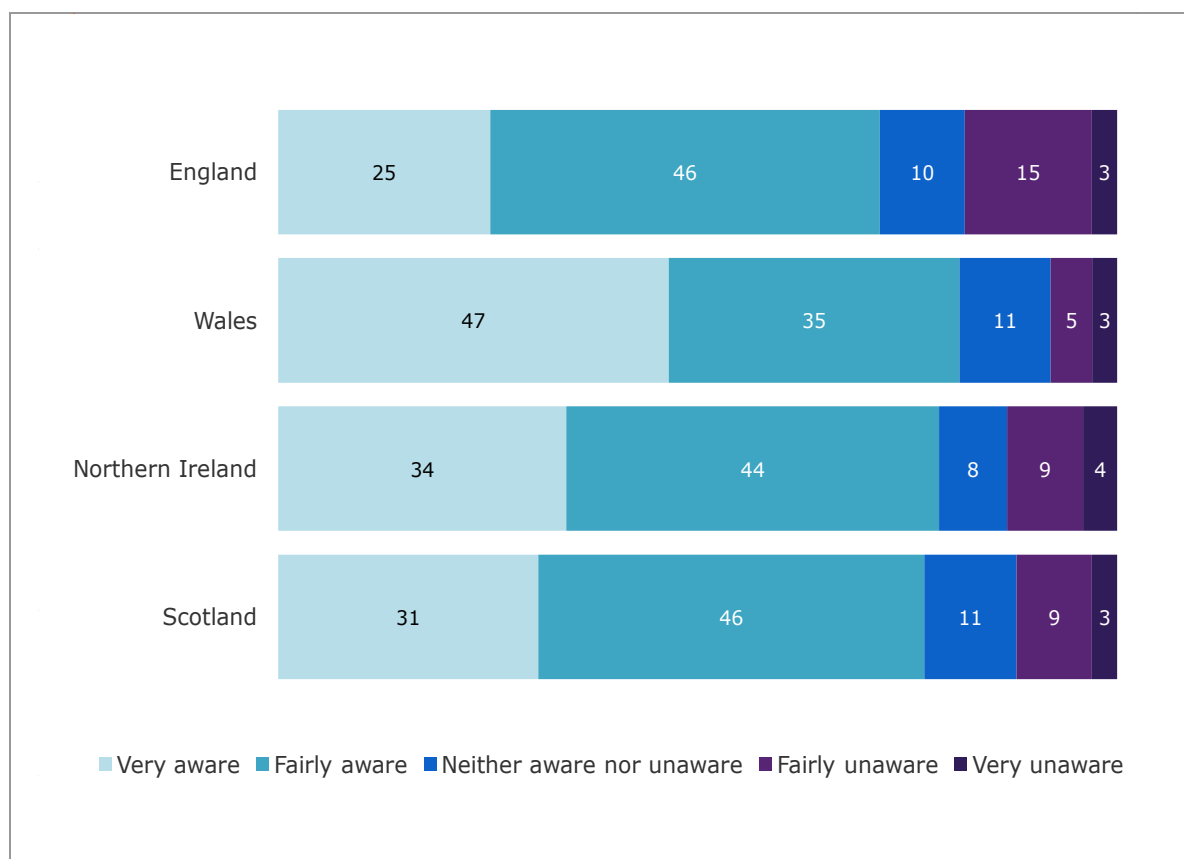


Source: Q2_37 When you eat out, how aware would you say you generally are about standards of hygiene?

Base: All respondents who eat out (from one third of total sample) – Wave 1 (983); All respondents who eat out – Wave 2 (3097)

Respondents in Wales were more likely than those in other UK countries to say that they were ‘very aware’ of standards of hygiene when eating out (47%) whilst respondents in England were least likely to say they were ‘very aware’ (25%). See Figure 5.7 below.

Figure 5.7 Awareness of hygiene standards when eating out by country (Wave 2)



Source: Q2_35 Generally, when you're deciding where to eat out, which of the following are important to you? & Q2_37 When you eat out, how aware would you say you generally are about standards of hygiene?

Base: All respondents – England (2116); Wales (104); Scotland (507); NI (504); All respondents who eat out – England (2032); Wales (98); Scotland (485); NI (482)

Husain et al, 2012 and Greenstreet (2008) found that cost, convenience, taste, quality, type of food and cuisine, special dietary requirements, familiarity, novelty, variety, ambiance and service were salient in decisions on where to eat out. The weight given to these various factors differed according to the occasion, time of day and with whom individuals were eating. The study further noted that in each focus group there were usually one or two participants who said that food hygiene was not a high priority when choosing where to eat or buy food, either because food hygiene standards were assumed to be high as a result of perceived rigorous inspection regimes, or because they were prepared to overlook poor hygiene because they loved the food. Among those aware of the Food Hygiene Rating Scheme (FHRS), some said that it had influenced where they ate but many indicated that it had not influenced their food-buying decisions. There was no

evidence that awareness had led any participants to attach higher priority to food hygiene issues³⁰.

5.4 Awareness and use of hygiene standards indicators

5.4.1 Indicators of food hygiene standards

Those who said that they were aware of food hygiene standards at eating establishments were asked how they determined this, selecting responses from a prompted list³¹. The results from this question are presented in Figure 5.8.

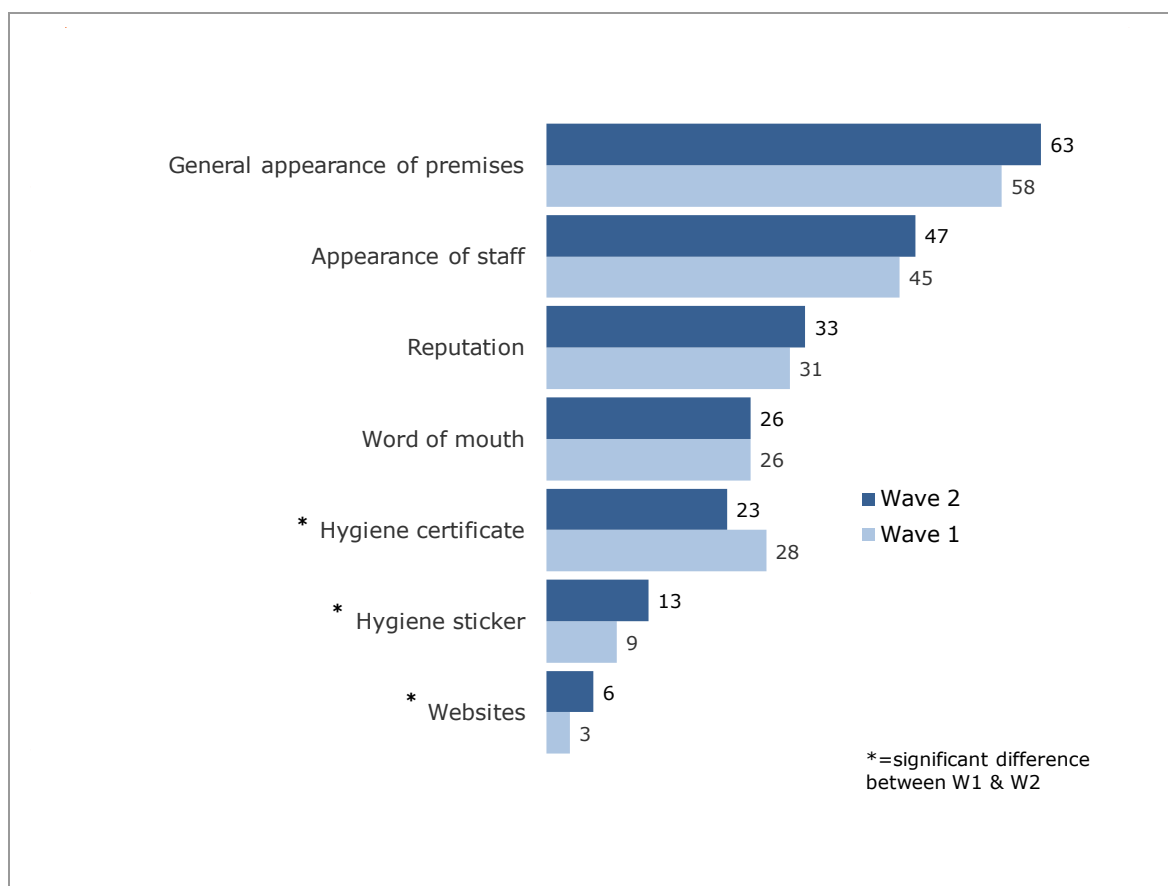
At Wave 2, as in Wave 1, respondents most commonly used appearance to judge the food hygiene standards of eating out establishments; the most commonly cited indicators being general appearance of premises (63%) and appearance of staff (47%). Reputation was also mentioned by a third (33%) of respondents.

The proportion citing *either* a hygiene certificate or a hygiene sticker did not change significantly from Wave 1 to Wave 2 (32% and 29%), although there were changes in the individual proportions, with those citing hygiene stickers increasing (from 9% at Wave 1 to 13% at Wave 2), and those citing hygiene certificates decreasing (from 28% at Wave 1 to 23% at Wave 2). There was also an increase in the proportion who reported using websites to find out about hygiene standards, from 3% at Wave 1 to 6% at Wave 2.

³⁰ Findings from Greenstreet (2008) and Husain et al (2012) appear to contradict evidence from the Food and You survey which indicated that hygiene and cleanliness were among the most important factors considered when deciding where to eat out. This apparent contradiction may reflect the different methodologies used. Food and You asked which of a list of factors were important, with cleanliness and hygiene being included as one of the possible factors, thus perhaps prompting its inclusion. Greenstreet and Husain et al based their evidence on conversations with small numbers of people in focus group settings which allowed for the exploration of context in the decision making process. It is acknowledged by Husain et al that influential factors differed according to the occasion, time of day and eating companions. It should further be noted that focus groups explored in depth reasons for attitudes and behaviour but were not representative of the wider population owing to small sample sizes.

³¹ These figures have been re-based on all respondents who ever eat out in order to display the total level of awareness of different sources.

Figure 5.8 Indicators used to inform hygiene standards – based on all respondents (Wave 2)



Source: Q2_38 How do you know about the hygiene standards of the places you eat out at or buy food from?

Base: All respondents who eat out– Wave 1 (983); Wave 2 (3097)

The relatively low proportion of respondents reporting that they use hygiene certificates and stickers to determine hygiene standards is consistent with previous research. In particular, findings from Wave 5 (November 2012) of the FSA Biannual Public Attitudes Tracker showed that respondents consistently report using the general appearance of the premises (60%), the appearance of staff (45%) and reputation (38%) as the main methods of determining hygiene standards. It was found, however, that there has been a steady increase in the proportion of respondents using hygiene certificates (37%) to determine hygiene standards³².

Some variations by country were apparent in the proportion of respondents eating out who said that they used either a food hygiene sticker or certificate to be aware of hygiene standards when eating out. Whilst 29% of all respondents reported they used either a hygiene sticker or a certificate as an indicator of food safety when eating out, respondents

³² Figure are from Wave 5, November 2012, of the Tracker:
<http://www.food.gov.uk/multimedia/pdfs/biannualpublicattitudetrack.pdf>

living in Northern Ireland (47%) were significantly more likely to mention using a hygiene certificate or sticker than those in England (28%), Wales (31%) or Scotland (23%).

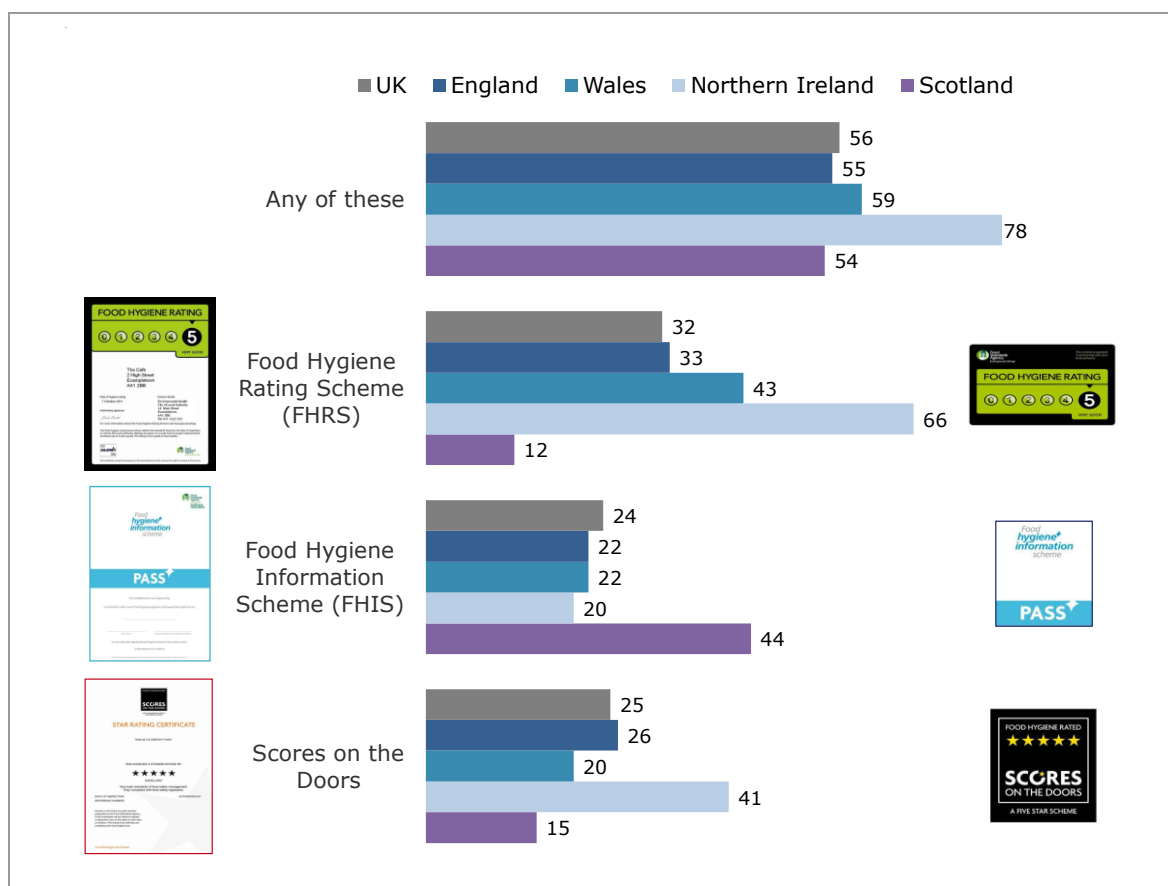
5.4.2 Recognition and use of the food hygiene rating schemes

Respondents were shown images of certificates and stickers for the Food Hygiene Rating Scheme (FHRS), the Food Hygiene Information Scheme (FHIS) and Scores on the Doors (SoTD)³³ and were asked whether they had ever seen them before.

One-third (34%) of respondents in England, Wales and Northern Ireland reported having seen the FHRS certificate and/or sticker before. Awareness of the FHRS certificate and/or sticker was particularly high among Northern Irish respondents (66%), compared with awareness in England (33%) and Wales (43%). In Scotland, 44% of respondents reported having seen the FHIS certificate and/or sticker before. There was also a relatively high level of awareness of the FHIS certificate and/or sticker in England, Wales and Northern Ireland (around 20% in each). A quarter (25%) of all respondents reported having seen the Scores on the Doors certificate before. Awareness of the Scores on the Doors scheme was also higher in Northern Ireland (41%) compared with England (26%), Wales (20%) and Scotland (15%). Reported awareness of *any* scheme certificate and/or sticker (56%), also indicated respondents in Northern Ireland were the most aware of food hygiene schemes generally, with 78% claiming awareness of any scheme compared with between 54% and 59% in other countries (Figure 5.9).

³³ This last scheme is a set of locally delivered schemes which local authorities have replaced with the national FHRS/FHIS scheme. It was decided to include it in the question as it was the most widespread initiative outside of the FHRS/FHIS.

Figure 5.9 Whether respondent had seen any of the three food hygiene rating scheme stickers/certificates (Wave 2)



Source: Q12_1 Have you ever seen any of these before?

Base: All respondents – Wave 2- England (2116); Wales (104); NI (504); Scotland (507)

It is not surprising that awareness levels of the FHRS/FHIS varied by country, given that the extent of publicity accompanying the launch of FHRS/FHIS has also varied between countries and by local authority. For example, Wales and Northern Ireland had conducted public information campaigns before the fieldwork while local authorities in England and Scotland were mostly reliant on publicity through the local media. Publicity for the FHRS has been particularly widespread in Northern Ireland. The level of local authority participation may also have an impact as this is currently voluntary. Local authority participation in the FHRS is voluntary but since its launch in October 2010 the scheme has been adopted by 96% of local authorities across England, Wales and Northern Ireland. This includes all local authorities in Wales and 25 of the 26 in Northern Ireland. It is anticipated that 99% of local authorities across the three countries will be operating the FHRS by early summer 2013. In Scotland, all 32 local authorities are committed to the adoption of the FHIS, with 24 already running it. It is also important to note that it is not mandatory for food establishments to display their hygiene rating sticker or certificate.

Whilst these figures provide a baseline in levels of awareness, future waves would enable monitoring of how awareness of hygiene schemes changes over time. Figures can also be compared against the FSA's Biannual Public Attitudes Tracker³⁴ which in Wave 5 (November 2012) found that 50% of respondents in England, Wales and Northern Ireland reported having seen the FHRS certificate and / or sticker before and 32% of respondents in Scotland reported having seen the FHIS certificate and / or sticker before.

Respondents who reported being very aware of hygiene standards when eating out were more likely to report having seen at least one of the certificates and / or stickers than those who reported being fairly or very unaware (60% and 51% respectively). There was also evidence of some variation in the level of awareness of hygiene rating certificates and / or stickers, with higher levels of awareness of any of the three hygiene rating certificates and / or sticker amongst those who reported:

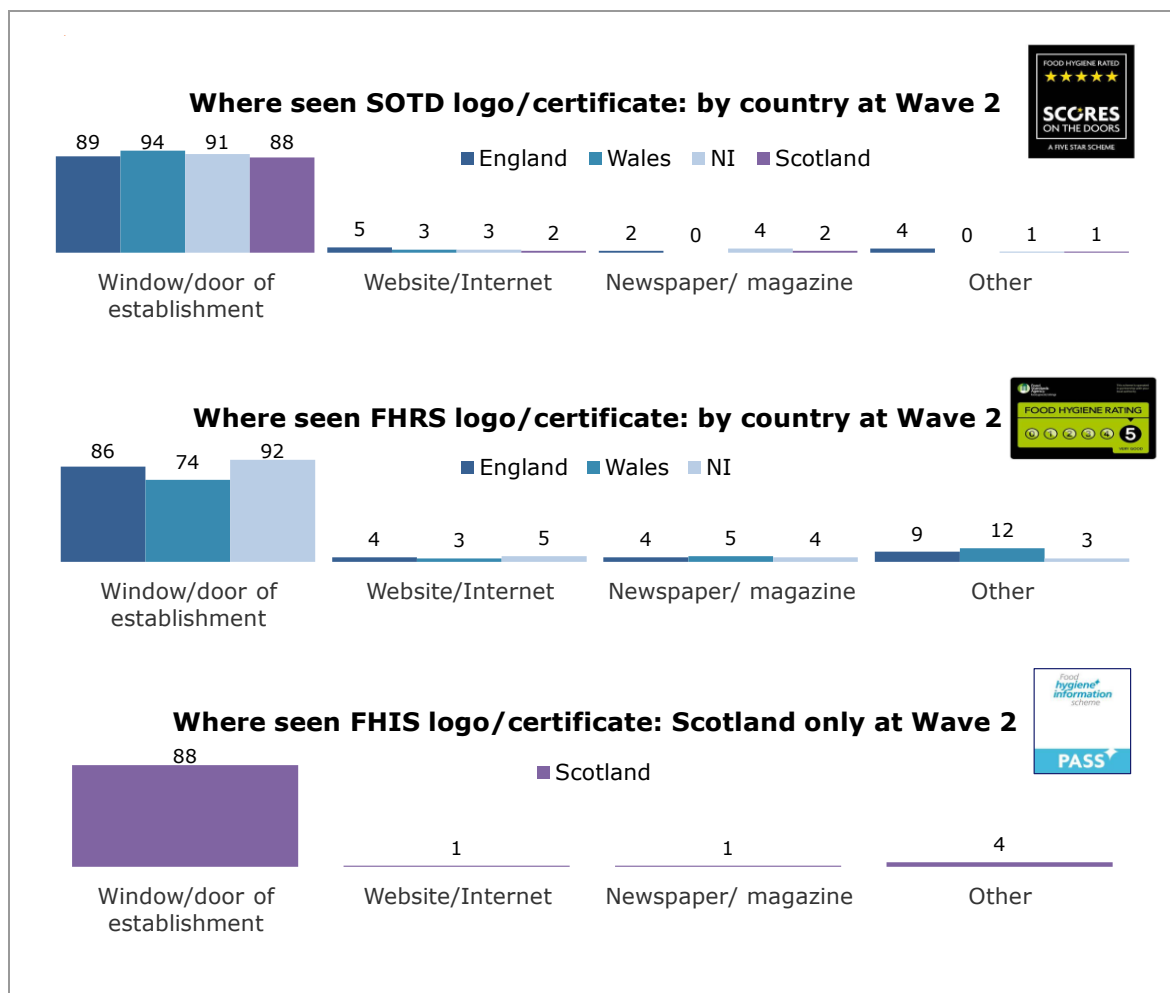
- A higher frequency of eating out (66% of those who had eaten out at least 6 times a week, compared with 42% of those who had not eaten out in the last 7 days);
- Experience of food poisoning in the past (60% compared with 53% with no such experience); and
- Allergies to certain foods (66% compared with 55% who did not have any allergies).

5.4.3 Where the certificate / sticker had been seen

Respondents who reported having seen any of the three types of certificates / stickers before were asked, unprompted, *where* they had seen it. Overwhelmingly, the most common place respondents reported seeing any of the three certificates and / or stickers was the window or door of a food establishment. In particular, respondents in Northern Ireland (92%) were most likely to report having seen the FHRS certificate and / or sticker on a window or door. Respondents in Wales were more likely than those in other countries to mention seeing the hygiene certificate and / or sticker via an 'other source'. Figure 5.10 shows the results for the relevant schemes by country.

³⁴ <http://www.food.gov.uk/multimedia/pdfs/biannualpublicattitudetrack.pdf>

Figure 5.10 Where respondents had seen the three scheme images (Wave 2)



Source: Q12_2 Where have you seen this image?

Base: All respondents who have seen the image before - SOTD – England (519); Wales (24); Scotland (73); NI (187); FHRS – England (625); Wales (48); NI (322); FHIS – Scotland (214)

5.4.4 Use of food hygiene rating schemes

After being shown certificates and stickers from the three hygiene standards schemes, respondents were asked if they had used a hygiene scheme like this in the past 12 months. Overall, 10% said that they had, although this was considerably higher in Northern Ireland (27%) and lower in Scotland (6%). When the schemes were used, respondents reported that the most common way of checking the information was to look for information displayed at the food establishment (89%). This is consistent with the

findings displayed in Figure 5.10 above. Of those respondents who said they had used a rating scheme in the last 12 months, 92% said that they had found it helpful.

5.4.5 Variation in awareness of hygiene standards and hygiene certificates and/or stickers by different groups in the population

As well as variation in awareness of hygiene standards and hygiene certificates and / or stickers by **country** as highlighted in the sections above, there was also considerable variation by a number of other socio-demographic factors.

Looking at **gender**, women were more likely than men to mention hygiene / cleanliness as a factor when deciding where to eat out (76% compared with 61%). There was little difference by gender in terms of awareness of the various food hygiene rating scheme stickers / certificates, with men being a little more likely to be aware of the FHRS certificate and / or sticker (35% compared with 30%).

Differences in awareness of hygiene standards and hygiene certificates and / or stickers by **age** were mixed. Whilst younger men aged 16-34 were least likely to consider hygiene and cleanliness and least likely to say that food hygiene standards were important when eating out (e.g. 48% of males aged 16-34 reported a good hygiene rating / score was important when eating out compared with 67% of males aged 35-54 and 69% of males aged 55 or more). However, younger respondents (women and men) were more likely to report they had seen a food hygiene rating certificate and / or sticker before (77% of 16-24 year olds reported this compared with 69% of 25-34 year olds and 20% of respondents aged 75 or over). Younger respondents were also more likely to report having used a food hygiene rating certificate and / or sticker when eating out compared with older respondents (38% of 25-34 year olds said this compared with 18% of respondents aged 55 or over).

Finally, respondents with **children aged under 16** tended to make more use of hygiene certificates and / or stickers as indicators of hygiene standards (35% compared with 25% of respondents without children aged under 16 living in the household).

6. Experience of food poisoning and attitudes towards food safety and food production

This chapter covers experience of food poisoning, attitudes towards food safety and food hygiene, and examines whether levels of concern are associated with differences in behaviours and opinions. The latter part of this chapter focuses on new food technologies, how knowledgeable respondents felt they were about them and whether respondents felt uneasy about their use.

Summary

Food poisoning

- 37% of respondents reported that they had experienced food poisoning in the past and 32% reported that, as a result of this, they had stopped eating at certain restaurants.

Attitudes towards food safety

- A quarter (24%) of respondents said they often worry about whether the food was safe to eat.
- More than three-quarters (77%) of respondents agreed with the statement that restaurants should pay more attention to food safety and hygiene.

Concern about food related issues

- Respondents who reported concern about food hygiene when eating out typically took some precautions to minimise the risk that they perceived. For example, they were more likely to have used a food hygiene standards scheme when deciding where to eat out (30% had used a hygiene certificate and 17% had used a hygiene sticker) than respondents who did not report concern (19% had used a hygiene certificate and 12% had used a hygiene sticker). Furthermore, 63% of respondents who were concerned about food hygiene when eating out said they took some action as a precaution; the most popular recourse was to pay more attention to the cleanliness of food establishments (37%).
- Respondents were concerned about food safety in imported products, and in particular meat imported from outside the UK; the proportion who said they were concerned about this was 62% compared with 31% for meat produced in the UK.
- When asked how concerned they were about a range of food safety issues, almost three-quarters (72%) of respondents reported being concerned about food poisoning and 64% reported being concerned about the use of additives.

Concern about new technologies

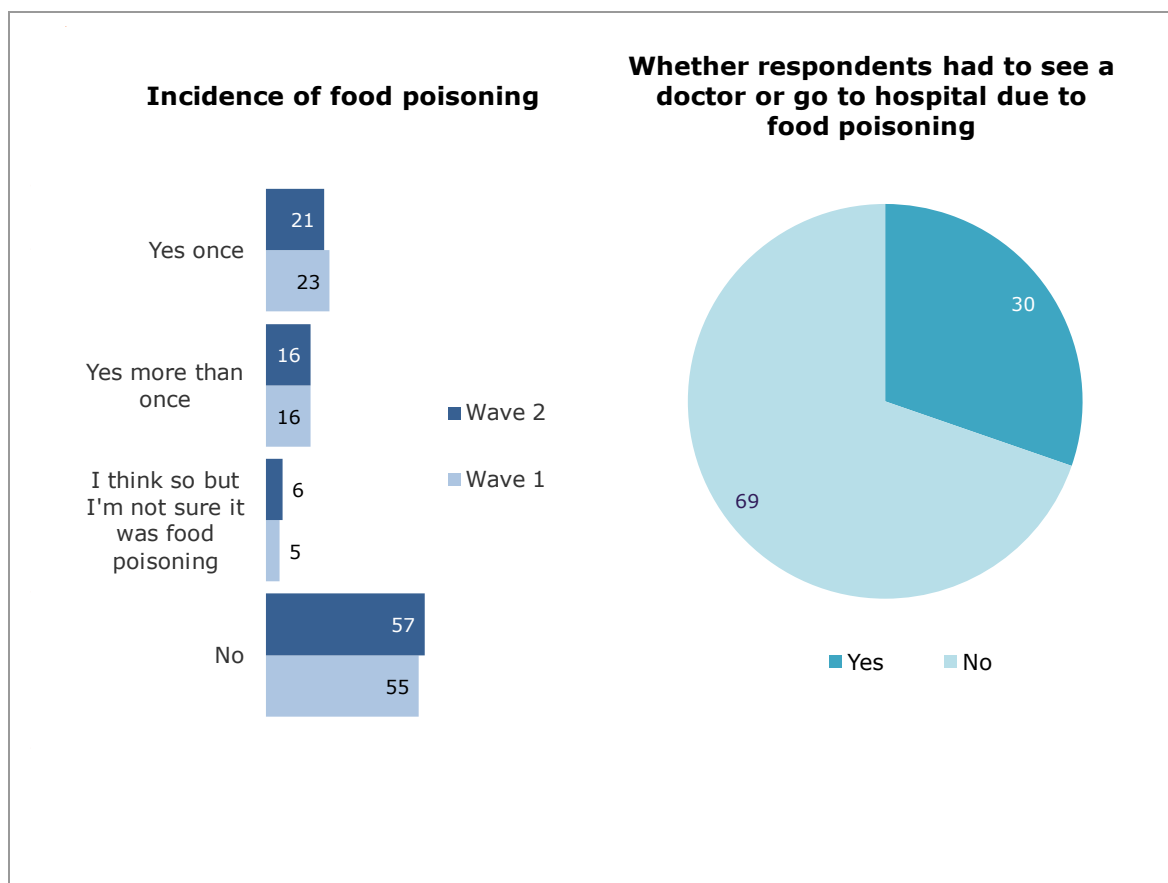
- There was substantial variation in reported awareness of new technologies involved in food production. Respondents reported being most aware about genetic modification (80%) and the least aware about nanotechnology (20%). Only a minority of respondents considered themselves to be knowledgeable about these technologies.
- Two-thirds (66%) of respondents reported being uneasy about animal cloning, whilst levels of unease were lower for nanotechnology (35%), irradiation (51%) and genetic modification (52%).

6.1 Experience of food poisoning

Overall, 37% of respondents reported that they had had food poisoning in the past (21% once and 16% more than once). Fifty-seven per cent of respondents reported they had never had food poisoning and 6% said that they weren't sure. Thirty per cent of respondents who had experienced food poisoning had seen a doctor or gone to hospital as a result of their most recent episode. Results are shown in Figure 6.1.

There was no significant difference in the proportion of respondents who had reported having experienced food poisoning between Wave 1 and Wave 2.

Figure 6.1 Experience of food poisoning (Wave 1 and Wave 2)

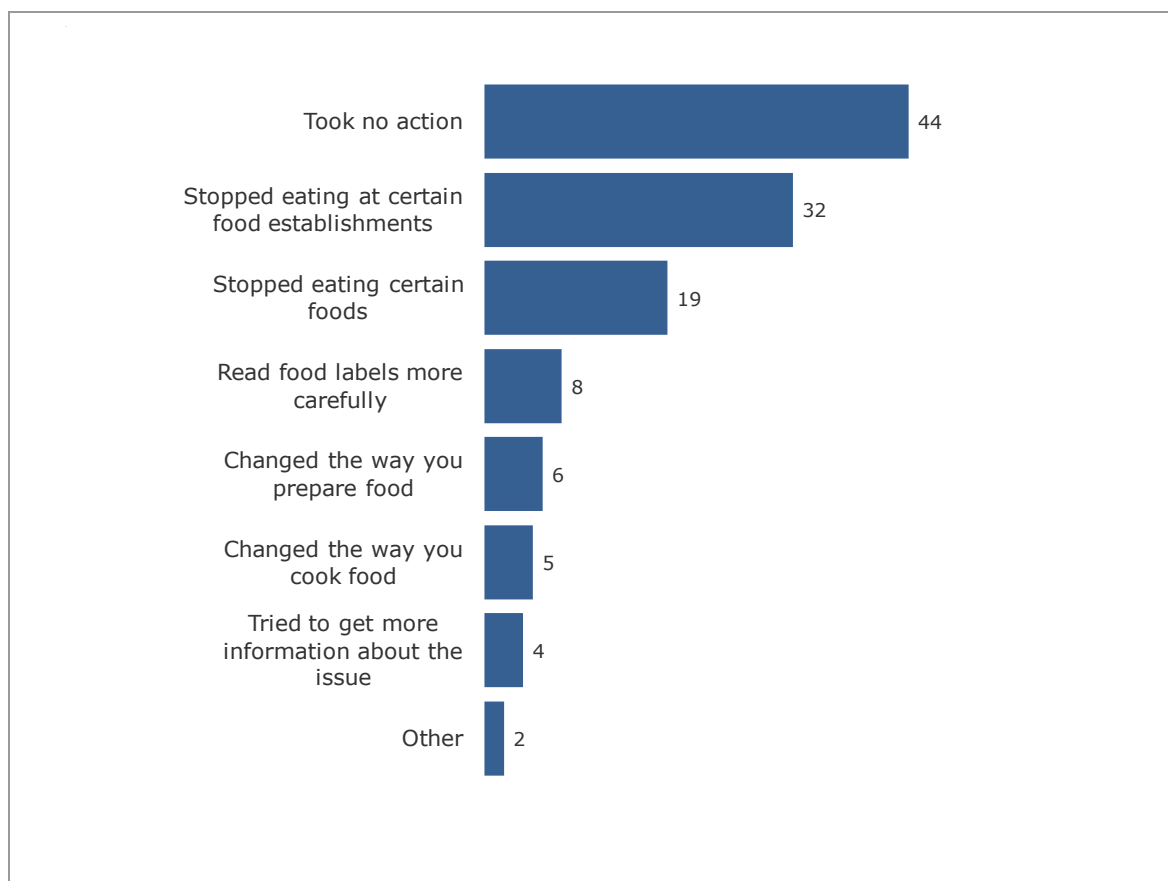


Source: Q4_28 Have you personally ever had food poisoning? & Q4_28A Thinking about the most recent occasion you had food poisoning, did you see a doctor or go to hospital because of it?

Base: Q4_28 All respondents - Wave 1(3163); Wave 2(3231) & Q4_28A All respondents who have had food poisoning Wave 2 (1293)

As a consequence of their food poisoning, one-third of respondents reported that they had stopped eating at certain food establishments and 19% reported that they had stopped eating certain foods. Only 4% reported that they had tried to get more information about the issue and a small proportion of respondents reported that they had changed the way they cooked (5%) and prepared (6%) food. Forty-four per cent of the respondents reported that they had taken no action (Figure 6.2).

Figure 6.2 Actions taken as a result of food poisoning (Wave 2)



Source: Q4_28B In response to when you had food poisoning (most recently) have you done any of the following?

Base: All respondents who have had food poisoning - (1293)

6.1.1 Variation in experience of food poisoning by different groups of the population

A slight difference by **gender** was apparent with 40% of women reporting having experience food poisoning compared with 46% of men. However, women were more likely to report having seen a doctor or gone to hospital as a result of their food poisoning (33% compared with 27%).

Age was also associated with varying experience of food poisoning. Whilst respondents aged 75 and over were the least likely to report having experienced food poisoning (24% compared with 34%-51% for other age groups), they were most likely to say that, on the most recent occasion that they had food poisoning, they had seen a doctor or gone to hospital (42% compared with 25%-35% for other age groups).

Finally, respondents with a **household income** above £52,000 were more likely to report food poisoning compared with respondents in households with incomes up to £10,999 (50% compare with 32%) but less likely to report that they had seen a doctor or gone to hospital (27% compared with 40%).

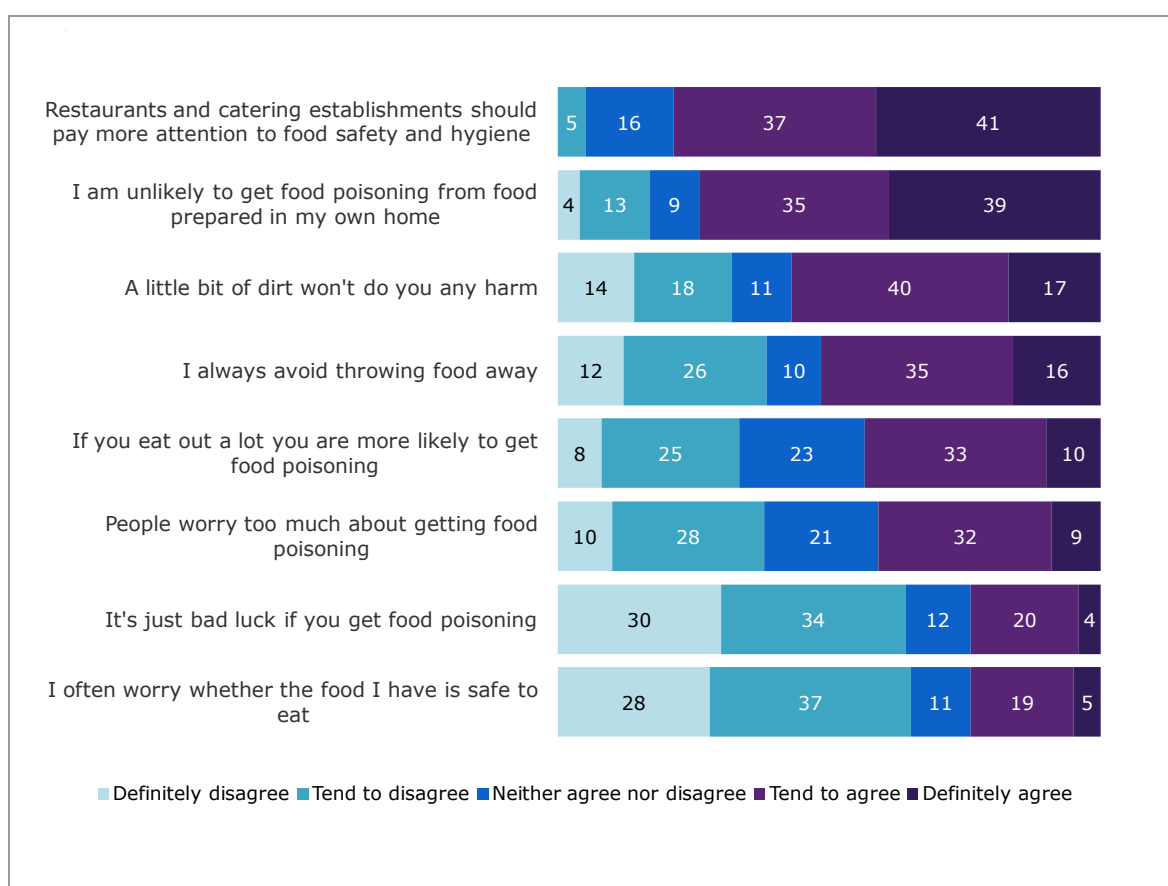
6.2 Attitudes towards food safety

Respondents were asked about the extent to which they agreed or disagreed with a range of statements relating to food safety.

Around three-quarters of respondents reported they agreed that restaurants and catering establishments should pay more attention to food safety and hygiene (77%), and that they were unlikely to get food poisoning from food prepared in the home (74%). Just over two-fifths of respondents (43%) agreed that if you eat out a lot you are more likely to get food poisoning (compared with 33% who disagreed).

Sixty-four per cent of respondents disagreed with the statement that it is just bad luck if you get food poisoning (compared with 24% who agreed). A quarter (24%) of respondents agreed that they worried about whether food was safe to eat, 41% agreed that people worry too much about getting food poisoning (38% disagreed) and 57% agreed that a little bit of dirt won't do you any harm. Full results are shown in Figure 6.3.

Figure 6.3 Attitudes towards food safety (Wave 2)



Source: Q4_27 And now I will read out a few statements people have made and would like you to tell me whether or not you agree with them.

Base: All respondents - (3231)

These statements were also included in Wave 1 of the Food and You survey, allowing changes in attitudes over time to be monitored. Whilst some changes are significant, the sizes of the changes were relatively small. For example, in Wave 2, respondents were less likely than in Wave 1 to agree that restaurants and catering establishments should pay more attention to food safety and hygiene (77% compared with 82%). Between Wave 1 and Wave 2, there was also an increase in the proportion of people agreeing that they always avoided throwing away food. Respondents were also less likely to agree over time that it's just bad luck if you get food poisoning (24% compared with 28%). Statistically significant changes between Wave 1 and Wave 2 are shown in Table 6.4.

Table 6.4 Attitudes to food safety, Wave 1 and Wave 2

% Agreeing with each statement	Wave 1	Wave 2
Restaurant and catering establishments should pay more attention to food safety and hygiene	82%	77%*
I always avoid throwing food away	48%	52%*
It's just bad luck if you get food poisoning	28%	24%*
Base	(3, 163)	(3,231)

* Significant difference between W1 & W2

Respondents who had reported previous experience of food poisoning also differed in attitudes to food safety compared with respondents who did not report having had food poisoning. They were: less likely to agree that people worry too much about food poisoning (36% compared with 44%); more likely to disagree that it's just bad luck if you get food poisoning (66% compared with 61%); more likely to disagree that they were unlikely to get food poisoning from food prepared in their own home (19% compared with 15%); and more likely to agree that they worry about whether the food was safe to eat (26% compared with 22%).

Respondents who reported that their general health was good were less likely to agree that it's bad luck if you get food poisoning (22%) than those who reported that their health was bad (31%). However, those who reported that their health was good were also less likely to worry (22%) about whether their food was safe to eat than those with poor health (36%). Fifty-eight per cent of respondents who deemed themselves to be healthy agreed that a little bit of dirt won't do any harm whereas 49% of those who considered themselves to have poor health thought the same.

6.2.1 Variation in attitudes towards food safety by different groups in the population

Differences in attitudes towards food safety were found to vary by **age** with older respondents being more likely to agree that they are unlikely to get food poisoning from food prepared at home (90% for those aged 75 and over, decreasing to 57% for those aged 16-24). Respondents living in a household with young **children** were less likely to agree that a little bit of dirt won't do any harm.

Respondents with lower **levels of education** were seemingly less concerned about food safety issues than those with higher levels of education. For example, respondents with below-GCSE level qualifications were more likely to agree that people worry too much about food poisoning (49%) compared with respondents educated to degree level or higher (33%) and that food poisoning was a case of bad luck (36% compared with 16%). However, respondents with below-GCSE level qualifications were also more likely to report that they often worry about whether the food they have is safe to eat (33% compared with 19% of respondents educated to degree level or higher).

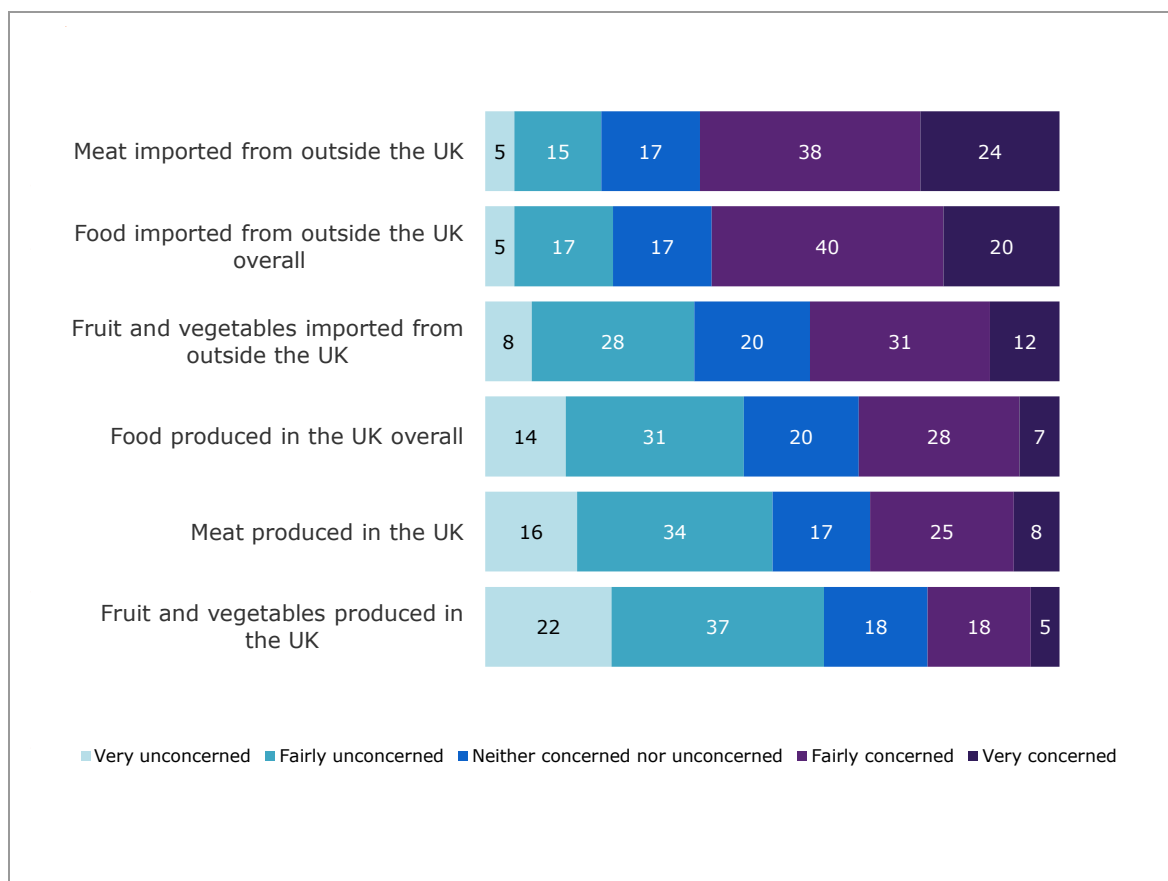
6.3 Concern about where food is produced and other food safety issues

6.3.1 Concern about where food is produced

Respondents were asked how concerned they were about food produced in the UK and food imported from outside the UK. Forty-five per cent of respondents said that they were unconcerned about the safety of food produced in the UK, although 28% said they were fairly concerned (Figure 6.5).

There tended to be more concern about food imported from outside the UK, and in particular meat rather than fruit and vegetables. Sixty-two per cent of respondents expressed concern about the safety of meat imported from outside the UK and a quarter (24%) said that they were very concerned about it. This contrasts with 8% of respondents who said they were very concerned about meat produced in the UK.

Figure 6.5 Concern about where food is produced (Wave 2)



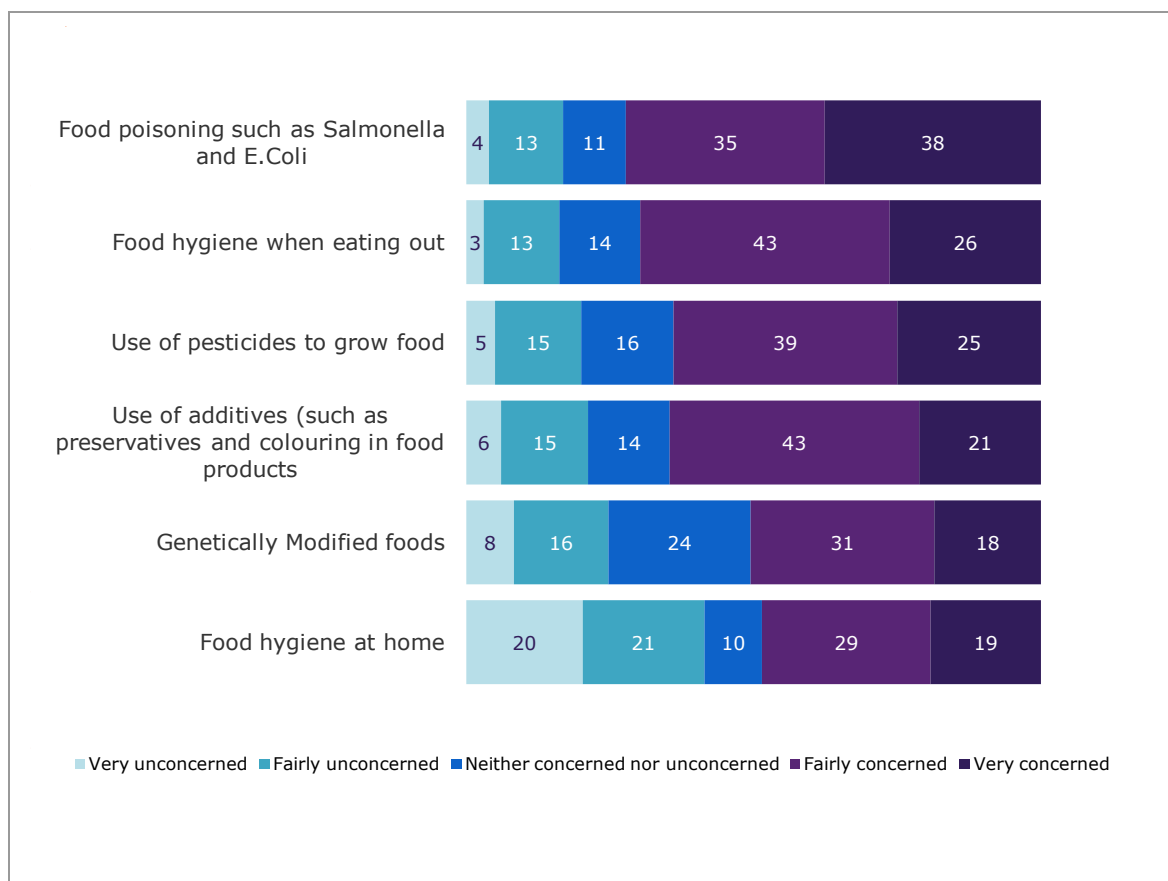
Source: Q9_2 Please tell me the extent to which you are concerned or unconcerned by each of the following issues...

Base: All respondents (3231)

6.3.2 Other food safety related issues

Respondents were also asked how concerned they were about a range of other food issues including food poisoning, the use of pesticides and genetically modified (GM) foods. For all issues, a higher proportion of respondents reported being concerned than unconcerned. The highest levels of concern were expressed for food poisoning (72%) and food hygiene when eating out (69%). Respondents were least concerned about food hygiene at home (48%) and genetically modified foods (49%). Figure 6.6 shows the full results.

Figure 6.6 Other food safety related issues (Wave 2)



Source: Q11_3 Please tell me the extent to which you are concerned or unconcerned by each of the following issues?

Base: All respondents (3231)

Concern about food poisoning was higher among those who reported previous experience of food poisoning, with just over three-quarters (77%) of this group stating that they worried about food poisoning compared with 69% of those who had not experienced food poisoning.

Respondents who expressed concern about food hygiene when eating out were more likely than those who reported that they were not concerned to make use of food hygiene ratings and hygiene certificates / stickers, and to be aware of food hygiene standards when eating out. See Table 6.7.

Table 6.7 Awareness and use of food hygiene standards, by level of concern about food hygiene when eating out

% saying each	Level of concern about food hygiene when eating out	
	Very / fairly concerned	Very / fairly unconcerned
Good hygiene rating score is important	31% *	16%
Aware of food hygiene standards when eating out	77% *	62%
Used a hygiene sticker to know about hygiene standards	17% *	12%
Used a hygiene certificate to know about hygiene standards	30% *	19%
Base	(2211)	(540)

* Significant difference between Very / fairly concerned and Very / fairly unconcerned

Analyses were carried out to investigate whether respondents who said they were very concerned about food hygiene at home reported different domestic food safety practices than respondents who said they were very unconcerned. Table 6.8 shows that respondents with the highest levels of concern about food hygiene at home were generally more likely to report practices in the home that were in line with FSA guidelines. The only exception to this pattern was a higher level of washing of raw meat and poultry by the most concerned group, a practice that is not in line with FSA guidelines.

When studying these figures it should be noted that, given the association between level of concern about food hygiene and factors such as age and education (see Section 6.2.1 above), it may be that such ‘confounding’ factors account for the association with food safety practices, rather than being directly related to respondent’s level of concern. Further analysis would be required to reveal any effect of individual variables.

Table 6.8 Food safety practices, by level of concern about food hygiene when eating at home

% agreeing with each statement	Level of concern about food hygiene when eating at home	
	Very concerned	Very unconcerned
Always cook food until it is steaming hot throughout	87% *	82%
Always wash raw meat and poultry	51% *	42%
Always wash hands after handling raw meat	92% *	84%
Always check use by dates when about to prepare or cook food	82% *	65%
Use tea towels to dry washing up more than once a week	76% *	70%
Change tea towels once a week or more	91% *	85%
Use the use by date to tell whether raw meat like beef, lamb, pork or poultry is safe to eat or use in cooking	28% *	22%
Use the use by date to tell whether milk and yoghurt is safe to eat or use in cooking	33% *	27%
Base	(631)	(678)

* Significant difference between Very concerned and Very unconcerned

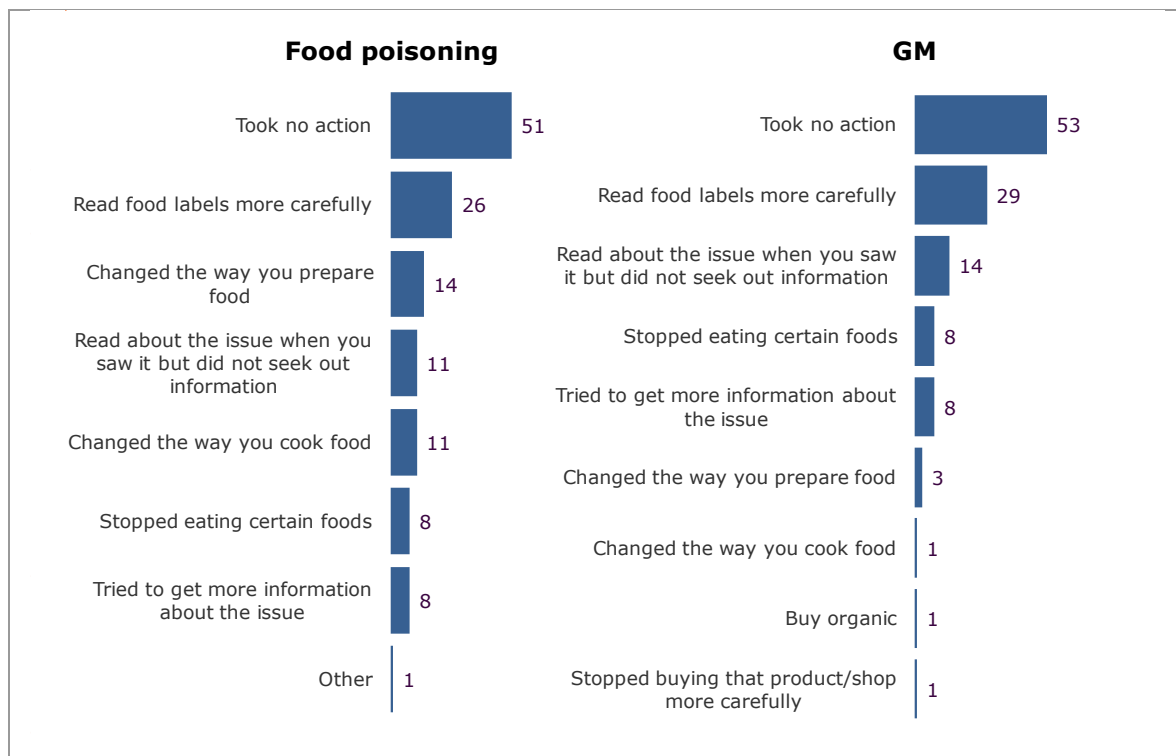
6.3.3 Actions taken as a result of food concerns

Further analysis was carried out on respondents who were concerned about a food related issues, and who had sought information about this concern. This analysis looked at the sources which respondents reported using to get information about how to prepare and cook food safely. Some of the more popular sources of information included family / friends and TV programmes on food and cooking. For example, of those who said they had tried to get more information as a consequence of their concern about Salmonella and E. coli, half (51%) got information about food safety from food TV shows and 41% sought information from family and friends. Those who said they were concerned about GM foods were also more likely to report that they had received information from family and friends (56%) rather than using common sense / personal experience (2%). As for concern about food hygiene when eating out, the most frequent source of information used was an internet search engine (52%). Finally, of the respondents who were concerned about food hygiene at home and tried to get more information, most reported they used product packaging to find information (54%).

Respondents were also asked what they did, if anything, as a result of a concern about a food related issue. For most issues, the majority of respondents reported that they took no action. However, respondents who reported being concerned about additives, were most likely to report that they read food labels more carefully (45%) and respondents who were concern about food hygiene when eating out were most likely to say that they paid more attention to the cleanliness of food establishments (37%) as a result.

Generally, if people did take action as a result of their food concerns, the most frequently reported action was to read food labels more carefully. One of the least common actions was to actively stop buying a product or to shop more carefully; for example only 1% did this as a result of their concern about GM foods (Figures 6.9 - 6.10).

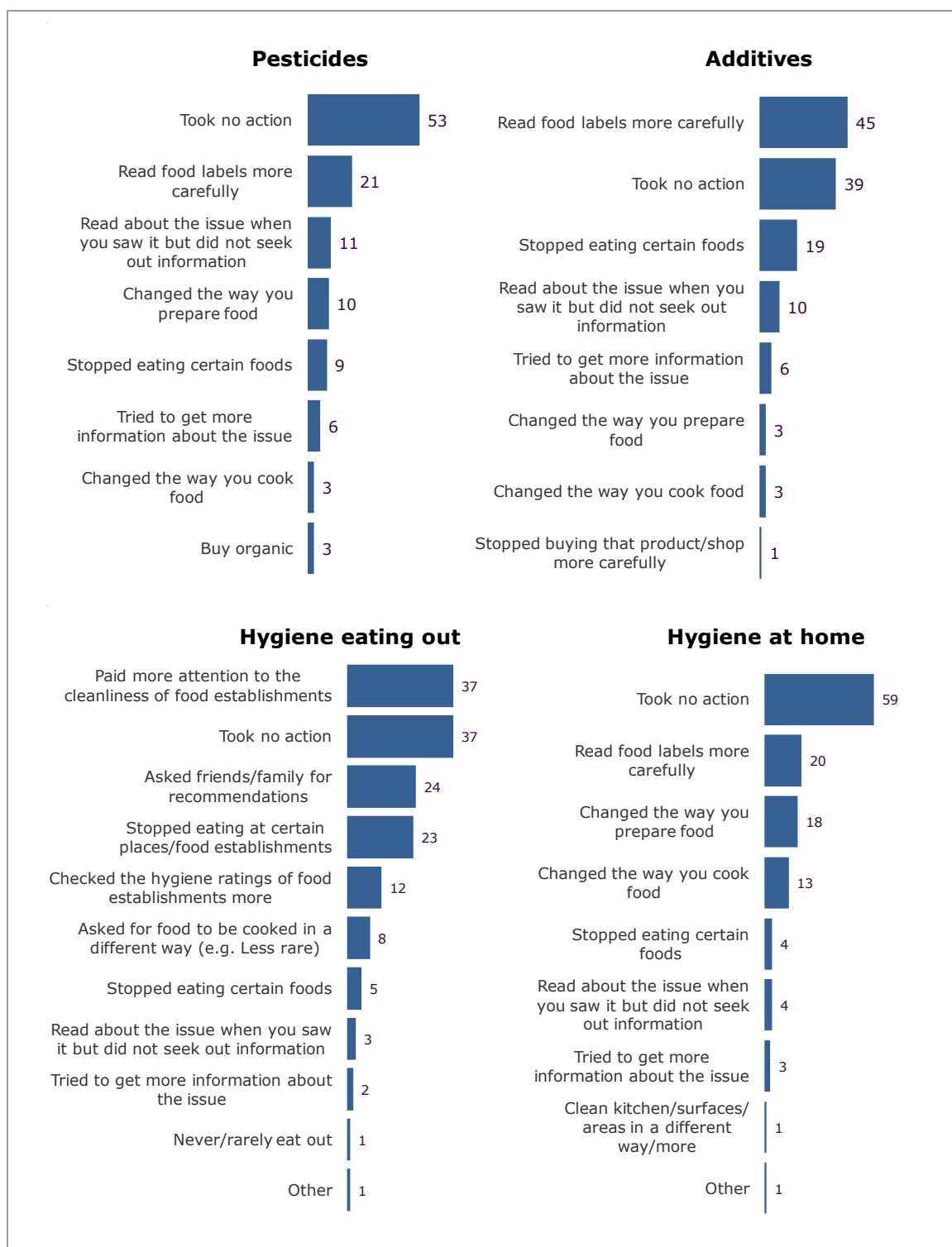
Figure 6.9 Actions taken as a result of food concerns (1) (Wave 2)



Source: Q11_4 You have indicated that you are concerned about.... In response, have you done any of the following over the past year?

Base: All respondents who are concerned about the issue - Food poisoning (2290); GM (1595)

**Figure 6.10 Actions taken as a result of food concerns (2)
(Wave 2)**



Source: Q11_4 You have indicated that you are concerned about.... In response, have you done any of the following over the past year?

Base: All respondents who are concerned about the issue - Pesticides (2091); Additives (2075); Eating out (2211); Eating at home (1534)

6.3.4 Variation in concern about food safety and production issues by different groups in the population

Variation by **gender** was found in the level of concern reported for a number of food safety and production issues. Women tended to be more concerned than men about food imported from outside of the UK, in particular meat (e.g. 63% of women reported being concerned about food imported from outside the UK compared with 58% of men). Women were also more concerned than men about most food safety issues. For example, use of pesticides and additives (in both cases 69% of women reported being concerned compared with 59% of men), and food poisoning (76% compared with 69%). The only food safety issue where the level of concern was similar between men and women was food hygiene at home.

Age was also a significant factor with older respondents expressing greater levels of concern on issues such as food imported from outside of the UK. For example, among those aged 60 and over, 71% said that they were concerned about food imported from outside the UK compared with 51% of 16-34 year olds. Those aged 60-74 were also more concerned than younger age groups about a range of issues including GM foods, pesticides and additives, although concern levels decreased for those aged over 75. For all food safety issues, respondents aged 75 and over were the least likely to report taking any action as a result of their concern. For example, as a result of their concern about food poisoning, 14% of respondents aged 16-24 said they changed the way they cooked compared with 4% of respondents aged 75 and over. Concern about food hygiene at home led to a quarter (24%) of 16-24 year olds reporting that they had changed the way they cooked food and a fifth (21%) reporting that they had changed the way they prepared food, whereas older age groups were less likely to make these changes (2% and 5% respectively).

Respondents who said they were **partly or completely vegetarian** were more likely to say they were concerned about the overall food safety of food produced in the UK (46% compared with 32% of respondents who had no dietary restrictions) and the safety of fruit and vegetables produced in the UK (34% compared with 21% of respondents who had no dietary restrictions). Genetic modification and the use of pesticides were also of greater concern for vegetarian/vegan respondents (61% and 80% compared with 48% and 62% of respondents with no dietary restrictions).

Finally respondents living with **children under the age of six** were more likely to scrutinise food labels as a result of concern about the use of additives in food production. Respondents who reported being concerned about the use of additives in food production, and who had children under the age of six in the household were more likely to take greater notice of food labels (53%) than respondents without young children (43%). Forty-five per cent of the former group also said that they paid more attention to the cleanliness of food establishments as a result of their concern about food hygiene when eating out, compared with about a third (35%) of the latter group.

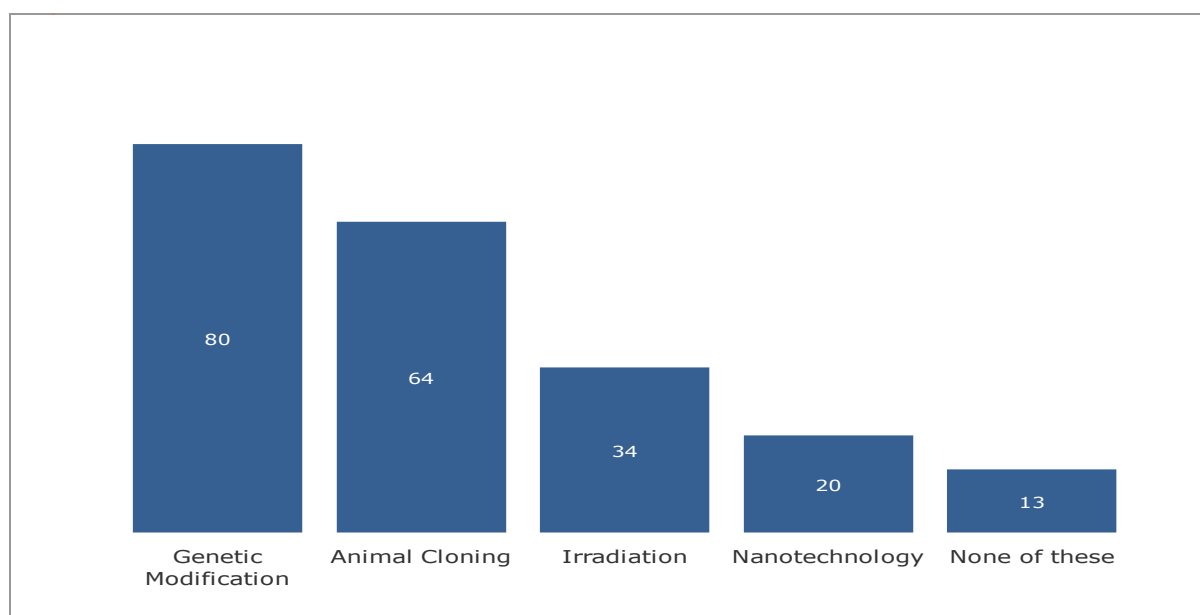
6.4 New food technologies

Despite there being EU regulations in place which ensure that food produced using new technologies, including genetically modification (GM), undergo a safety assessment and approval before being placed on the market, there remains considerable debate and concern over the impact of such technologies on the long term health of both individuals and the environment. It is important, therefore, for the Agency to collect data on awareness, reported knowledge of and levels of unease about GM, and other new food technologies.

6.4.1 Awareness of new food technologies

Respondents were asked whether they were aware of four new food production techniques³⁵. The most widely recognised was GM (80%), followed by animal cloning (64%), irradiation (34%) and lastly nanotechnology (20%)³⁶. Overall, 13% of respondents reported that they had not heard of any of these technologies (Figure 6.11).

Figure 6.11 Awareness of new food technologies (Wave 2)



Source: Q8_3 Which of the following have you heard of in relation to food production?
Base: All respondents - (3231)

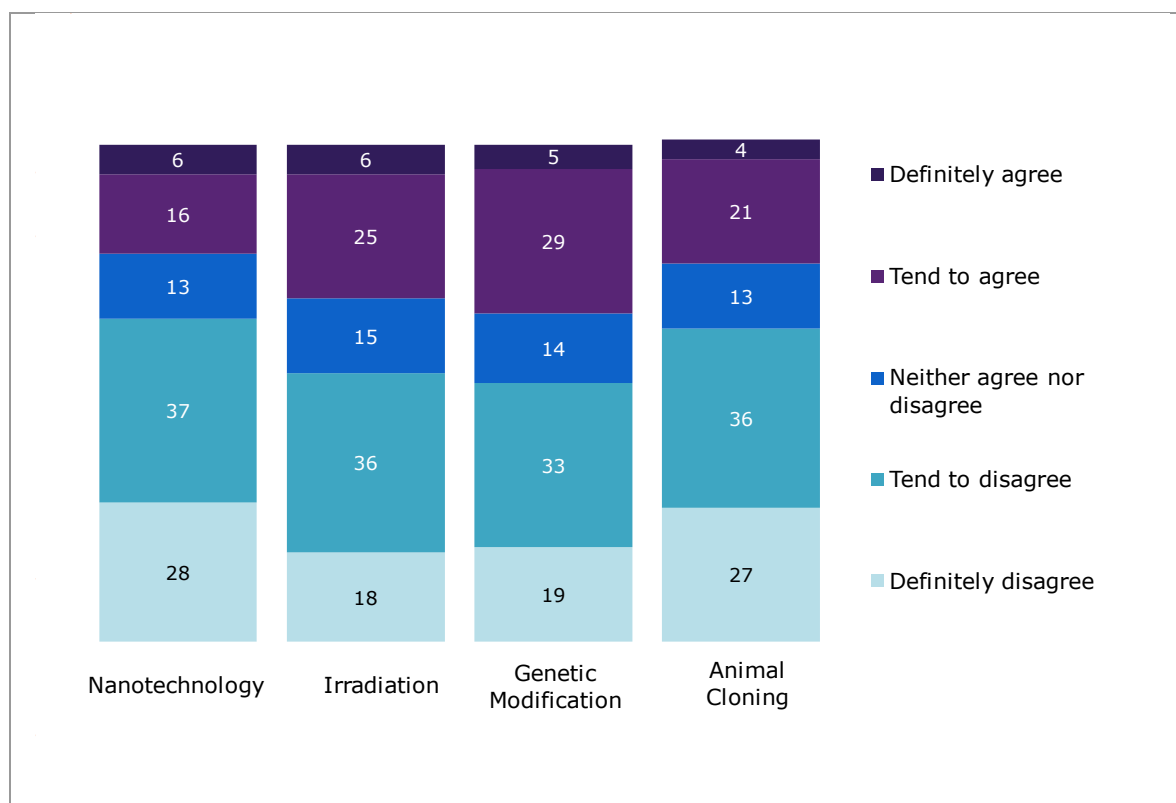
³⁵ These questions were asked before the questions reported in Section 6.3.2 which asked about levels of concern for GM food. Therefore there is no risk that awareness levels of GM could have been raised by previous questioning.

³⁶ Genetic modification is the process of changing the DNA of any living thing (plants, animals or micro-organisms) in a way that does not occur in nature. Animal cloning is the creation of an animal (the clone) that is an exact genetic copy of an existing animal. Food irradiation is a processing technique that exposes food to electron beams, X-rays or gamma rays. The process produces a similar effect to pasteurisation, cooking or other forms of heat treatment, but with less effect on look and texture. Irradiated food has been exposed to radioactivity but does not become radioactive itself. Nanotechnology is the ability to understand and manipulate materials at the nanoscale, which is usually taken to mean between one and a hundred millionths of a millimetre.

6.4.2 Knowledge of new food technologies

Respondents who said they had heard of each technology were asked about the extent to which they agreed or disagreed that they felt knowledgeable about the use of the technology in food production. Agreement with this statement was highest for GM (34%) and lowest for nanotechnology (22%) (Figure 6.12)

Figure 6.12 Knowledge of different methods of food production (Wave 2)



Source: Q8_4 How much do you agree or disagree with the following statement? I feel knowledgeable about the use of ... in food production

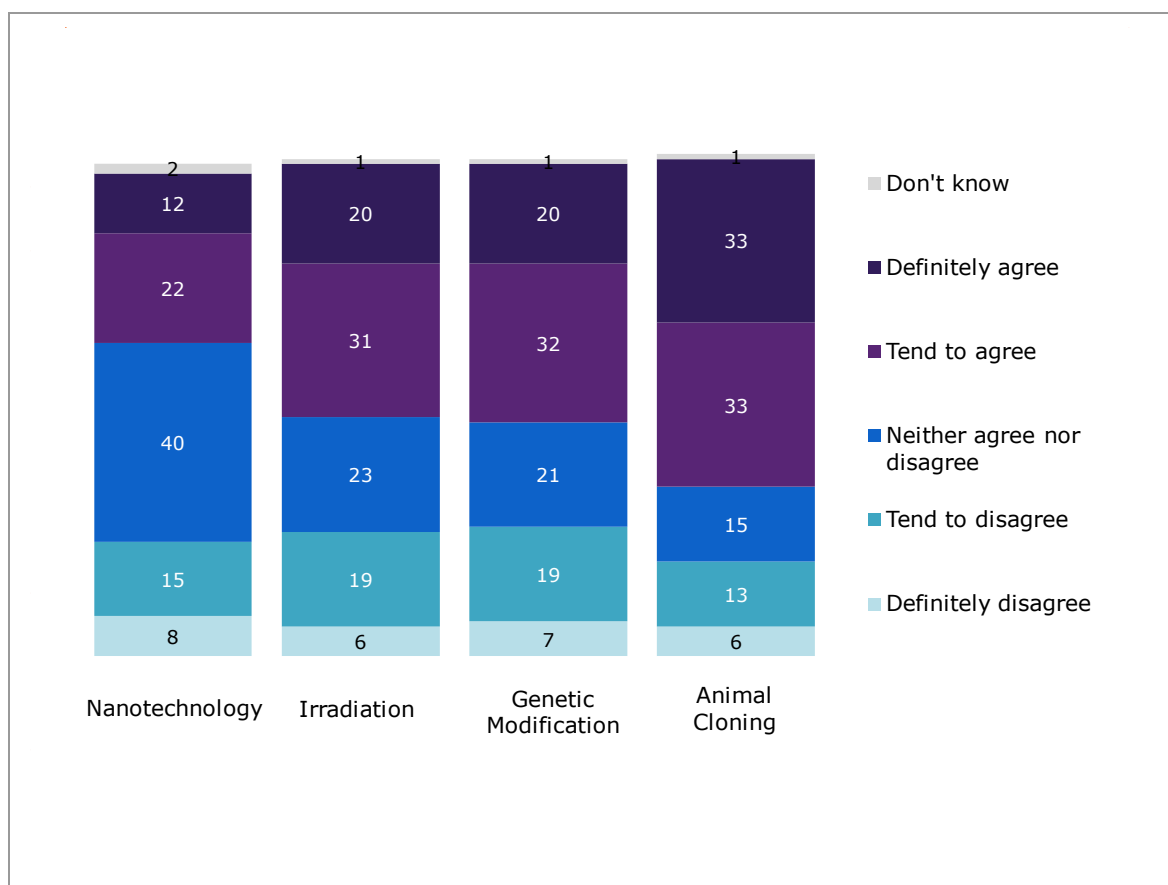
Base: Respondents who had heard of each - Nanotechnology (578), Irradiation (1059), Genetic Modification (2501), Animal cloning (2024)

6.4.3 Unease about new food technologies

Respondents who had heard of each food technology were also asked whether they agreed or disagreed that use of it in food production made them feel uneasy.

Animal cloning was the technology that respondents reported made them feel most uneasy; 66% of respondents agreed this made them feel uneasy. Nanotechnology was associated with the lowest level of uneasiness (35% agreed and 40% neither agreed nor disagreed). Half of respondents reported feeling uneasy about irradiation (51%) and genetic modification (52%).

Figure 6.13 Unease about different methods of food production (Wave 2)



Source: Q8_5 How much do you agree or disagree with the following statement? ...in food production makes me feel uneasy

Base: Respondents who had heard of each - Nanotechnology (578), Irradiation (1059), Genetic modification (2501), Animal cloning (2024)

6.4.4 Variation in awareness, knowledge and reported uneasiness about new food production technologies by different groups in the population

Awareness, knowledge and reported uneasiness about new food production technologies differed by **gender**. Women were less likely than men to have heard of new food production technologies (16% of women reported not being aware of any compared with 10% of men). Women were also less likely to agree they were knowledgeable about new food technologies (e.g. 21% of women reported being knowledgeable about animal cloning compared with 29% of men). However, they were more likely than men to say that such technologies made them feel uneasy (e.g. 74% of women reported feeling uneasy about the use of animal cloning in food production compared with 57% of men).

Variation by **age** was also apparent. Awareness was typically highest among 55-64s, with 16-24s being the least aware of new technologies (with the exception of nanotechnology, where they had the highest level of awareness of any age group) and awareness also declining for respondents aged 65 and over. For example, only 19% of 16-24s were aware of irradiation, increasing to 54% of 55-64s, and then declining to 32% of those aged 75+. However, among those aware of each new technology, those in younger age groups tended to be more knowledgeable compared with older respondents, with level of knowledge dropping significantly after the age of 75. For example, 43% of 16-24 year olds reported feeling knowledgeable about genetic modification compared with 31% - 35% of those in age groups between 25 and 74 and 23% of respondents aged 75 and over. Older respondents were more likely to report they felt uneasy about certain technologies (e.g. 38% of 16-24 year olds reported feeling uneasy about irradiation compared with 59% of respondents aged 60 and over).

7. Looking ahead

Food and You is the Agency's flagship social science survey, collecting essential evidence on food safety issues which, in turn, provide a mechanism for measuring the extent to which attitudes and reported knowledge and behaviour are in line with Agency recommendations and guidance. In doing so, the survey underpins the Agency's strategic objective of ensuring consumers have the information and understanding they need to make informed choices about where and what they eat. The survey also provides key evidence for FSA activity in preventing foodborne disease from food eaten both in and out of the home. Further, information on awareness of, and attitudes towards, current and future food production, such as imported foods, genetic modification and irradiation, support the Agency in making policy decisions in related areas. In this chapter, the value of Food and You Wave 2, the contribution of the survey to the wider evidence on food safety practices, and considerations for the future are discussed from the perspective of the Agency's Social Science Research Unit.

7.1 The value of Wave 2

As the only large-scale public survey of reported food safety behaviours and attitudes that uses a random probability sample, Food and You provides a rich source of data for other government departments, academics and researchers with an interest in food and related subjects. Within the Agency, Food and You provides robust evidence that complements a number of other surveys. For example, the Public Attitudes Tracker also collects data on concern about a number of food issues (such as food poisoning and food hygiene when eating out) and awareness and use of the Food Hygiene Rating Scheme/Food Hygiene Information Scheme.

Wave 2 of the survey has built on Wave 1 by collecting further baseline information. Combining data from both Waves provides larger samples allowing exploration of differences between smaller demographic groups defined in greater detail. For example, in both the Wave 1 and Wave 2 analysis, ethnicity has been examined using the broad comparison of White and non-White ethnic groups. Combining the data sets from two waves will provide large enough sample sizes to allow more illuminating distinctions between White, Mixed, Asian and Black ethnic groups.

A second wave of data has also enabled wave-on-wave analysis and this report has highlighted where there have been significant changes between Wave 1 and Wave 2. Although a further wave of data is required before trends can begin to be identified, Wave 2 is an important stepping stone towards building-up a high quality time series. It is important that questions in any future waves maintain consistency with both Wave 1 and Wave 2 so that the Agency can begin to monitor trends and assess how it is performing against its Strategic Plan.

The development of an index of recommended practice for food safety in this wave (see Chapter 4) has also introduced a more detailed analysis of socio-demographic differences in reported food safety practices. By identifying which groups in the population are most likely to report food safety practices not in line with recommended practice, the Agency is better placed to develop policies and communication strategies that target those who are likely to be most at risk from contracting a foodborne disease. There is also scope to develop the analysis on the index of recommended practice. Whilst this report has explored the likelihood of particular socio-demographic groups reporting behaviour that is not in line with recommended practice, more detailed analysis could explore which individual practices (such as frequency of checking fridge temperature, or washing raw meat) are more, or less likely to be reported by specific groups. This analysis would help the Agency to target practices where they can make the biggest impact in reducing risk of contracting a foodborne disease.

7.2 Drawing together the evidence

Although Food and You provides data that is representative of the UK, it is limited to *self-reported* attitudes, knowledge and behaviour which, as Greenstreet Berman (2011) note, may not accurately reflect actual behaviour. Surveys are susceptible to bias, including response and optimism bias³⁷; they are also less adept at capturing behaviours such as food related practices that tend to be reflexive, routine and generally of low salience and thus susceptible to slipping from people's minds (recall errors).

Food and You is also limited in that it does not illuminate *why* respondents undertake certain practices or *why* these practices may differ across population groups. A number of other methodological and theoretical frameworks have been used to explore food safety practices and risk, including from a psychometric and sociological perspective (Lupton, 2000; Knox 2000). Summarized crudely, psychometric approaches explore how perceptions and responses to risks, including food safety risks, vary in relation to various psychological attributes³⁸ and help to explain why there is often a 'gap' between public perceptions and 'objective' or technical assessments. In contrast, sociological approaches proceed from the assumption that the ways in which risks are framed and acted upon are embedded in particular social contexts³⁹. Combining the insights from different disciplines and methods can help to unravel the complexities of food practices in the home as illustrated by Food and You (SSRC, 2009).

One project that will add to our knowledge in the Agency, and address some of the limitations above, is examining Kitchen Practices. Using a range of methods including

³⁷ Response bias is where respondents give the answers they believe the interviewer wants them to give, or which they deem to be socially desirable, even if in practice they do not do this. Optimism bias is where a person is less likely to believe they are at risk of experiencing a negative event compared to others.

³⁸ Including control (broadly self imposed risks are seen as more acceptable), optimistic bias, dread (see Slovic's work showing risks that evoke feelings of dread and fear are more negatively perceived, prior values and attitudes (our wider values influence our perceptions of and responses to particular risks – see Sjöberg, 2000 and Frewer et al, 1996).

³⁹ Horlick-Jones and Prades (2009: 414) illustrate how risk perceptions and resulting practices are "embedded within a matrix of everyday associations, preferred ways of life, trust relations, economic constraints and emotional commitments".

observation *in vivo* and Activity Recognition and Temperature sensors⁴⁰ the purpose of this work is to study *actual* domestic food practices in 20 UK households. It will seek to record, analyse and understand these practices, and the factors that underlie them, to allow an assessment of their potential impact on food safety.

Given the differing perspectives and value of these projects, the Agency is planning to draw together its knowledge base on UK domestic food safety practices. This will highlight areas of consistency and variation, and will identify gaps in the evidence base, informing the Agency's understanding of how to improve public knowledge and awareness of food hygiene and foodborne illness.

7.3 Food and You and the future

There are a number of areas of interest to the Agency which future waves of Food and You is well placed to capture. As consumer awareness, attitudes and behaviour are liable to shift over time, for example in response to emergent food production technologies or the recent identification of horse in beef products, it is important for the Agency to be able to monitor these changes. Another area that warrants further investigation is the impact that the current UK recession has on food issues in general and in particular the implications for food safety. Findings from Wave 2 present a mixed picture (see Chapter 5) and future waves could provide a better understanding of how changes in reported patterns of shopping, preparation, storage and consumption of food may be related to the wider societal and economic context. This will significantly add to the general store of evidence and may help the Agency to respond to future challenges.

In accordance with the original recommendations from the Social Science Research Committee, Food and You is currently being reviewed. Although the recommendations were for an annual time series a commitment was made to review effectiveness after 5 years. As Food and You has been carried out in alternate years the review is timely in that, should the recommendations include the need to build on the current time series, the Agency will be in a position to do this without an interruption to the timing.

⁴⁰ This monitors fridge temperature and hand washing for example.

8. Appendices

8.1 Methodology

8.1.1 Introduction

The Food and You 2012 survey comprised a total of 3231 interviews with adults (aged 16+, with no upper age limit) across the UK. The samples were boosted in Scotland and Northern Ireland, to enable more detailed analysis at a country level.

The total number of complete interviews achieved was:

- 2,116 in England,
- 104 in Wales,
- 507 in Scotland and
- 504 in Northern Ireland.

At the analysis stage, weighting was applied so that the weighted sample was representative of the UK as a whole.

8.1.2 The sample

In order to maximise consistency and comparability, the methodology adopted for sampling at Wave 2 was the same as for Wave 1. However, a fresh set of Primary Sampling Units (PSUs) was selected for Wave 2. A stratified random probability sample of private households in the UK was selected using the Postcode Address File (PAF) as a sampling frame. The PAF lists all known UK postcodes and addresses and is commonly used as a sampling frame for general population surveys. The Primary Sample Units (PSUs) were postcode sectors. Sectors with fewer than 500 addresses were grouped with neighbouring sectors prior to stratification.

The sample was stratified by region (formerly Government Office Region), the Census 2001 percentage of heads of households in a non-manual occupation (NS-SEC groups 1-3, banded into three equal-sized groups), the Census 2001 percentage of households with no car (banded into two equal-sized groups), and the Census 2001 population density (persons per hectare).

The list of postcode sectors was first sorted into the 12 regions– 9 in England, with Wales, Scotland and Northern Ireland listed separately. Within each region band, the list was then sorted into three groups based on the proportion of heads of household in a non-manual occupation. Each region/occupation band was then banded into two groups based on the percentage of households with no car. Within each band, postcodes were sorted by population density (persons per hectare). Any strata that contained fewer than 3 PSUs were grouped with adjacent strata prior to sample selection.

In each eligible household, one adult aged 16+ (with no upper age limit) was selected for interview, using a random selection procedure in households where there was more than one eligible adult.

An initial sample was drawn of 177 PSUs in England and Wales, 40 in Scotland and 40 in Northern Ireland. 25 addresses were sampled per PSU. A reserve sample of 17 additional points in England and Wales, and 10 each in Scotland and Northern Ireland was also selected⁴¹; of these, 10 were subsequently issued to interviewers, 4 reserve PSUs in England and Wales, and 6 in Scotland. The final number of PSUs was therefore 181 in England and Wales, 46 in Scotland and 40 in Northern Ireland (267 in total).

A total of 6675 addresses were issued to interviewers (4525 in England and Wales, 1150 in Scotland and 1000 in Northern Ireland). Of these, 6094 were eligible for interview (see Table 8.1)

8.1.3 Response rate

The response rate obtained was 54% of eligible households in the UK. Response rates varied by country:

- England and Wales – 53%
- Scotland – 52%
- Northern Ireland – 56%

The response rate was higher than that achieved at Wave 1 which was 52% overall and 51% for England and Wales, 50% for Scotland and 57% for Northern Ireland.

Tables 8.1 and 8.2 show the full breakdown of responses obtained; 8% of eligible households were not contacted, 32% refused to take part and 6% could not be interviewed for other reasons.

⁴¹ The reserve PSUs were a precaution, in case responses rates were lower than expected and the required sample size might not be achieved. In the event, monitored response rates were running a little lower than hoped so some reserve PSUs were issued.

Table 8.1 Breakdown of survey responses – UK total

	UK total	
	n	% of in scope
Addresses sampled	6675	
Ineligible addresses		
Not yet built/under construction/derelict/demolished	23	
Vacant/empty housing unit	342	
Non-residential address	81	
Communal establishment/institution	8	
Not main residence	74	
Other ineligible	18	
Unable to locate address	35	
Total ineligible	581	
In scope addresses	6094	100%
No contact		
No contact with anyone at the address	431	
No contact with selected respondent	41	
Needed parental permission but no contact with parent	2	
Total no contact	474	8%
Refusal		
Parental permission refused	2	
Office refusal (by letter, phone or email)	63	
Info about dwellings or occupants refused	768	
Refusal before interview	979	
Proxy refusal	155	
Total refusal	1967	32%
Other unproductive		
Broken appointment	134	
Person ill at home during survey period	36	
Selected person away or in hospital	54	
Physically or mentally unable	80	
Inadequate English	41	
Lost interview	15	
Other unproductive	32	
Total other unproductive	392	6%
Interview completed	3261*	54%

* This does not include 30 interviews in Scotland which were excluded from analysis because they were missing the healthy eating section due to a questionnaire error. As it was early in the fieldwork and not all of these 30 respondents had agreed to be recontacted it was decided that it would be best to replace these interviews. The 30 replacement interviews are included in the table and in the analysis. Additional sample points were issued to ensure that the number of complete interviews in Scotland exceeded the target of 500.

Table 8.2 Breakdown of survey responses – country level

	England and Wales		Scotland		Northern Ireland	
	n	% of in scope	n	% of in scope	n	% of in scope
Addresses sampled	4525		1150		1000	
Ineligible addresses						
Not yet built/under construction/derelict/demolished	6		7		10	
Vacant/empty housing unit	223		58		61	
Non-residential address	52		16		13	
Communal establishment/institution	6		2		0	
Not main residence	52		14		8	
Other ineligible	14		2		2	
Unable to locate address	20		12		3	
Total ineligible	373		111		97	
In scope addresses	4152	100	1039	100	903	100
No contact						
No contact with anyone at the address	241		79		111	
No contact with selected respondent	23		5		13	
Needed parental permission but no contact with parent	2		0		0	
Total no contact	266	6%	84	8%	124	14%
Refusal						
Parental permission refused	1		0		1	
Office refusal (by letter, phone or email)	43		14		6	
Info about dwellings or occupants refused	571		104		93	
Refusal before interview	660		215		104	
Proxy refusal	128		12		15	
Total refusal	1403	34%	345	33%	219	24%
Other unproductive						
Broken appointment	85		24		25	
Person ill at home during survey period	24		4		8	
Selected person away or in hospital	35		14		5	
Physically or mentally unable	54		17		9	
Inadequate English	28		5		8	
Lost interview	12		3		0	
Other unproductive	25		6		1	
Total other unproductive	263	6%	73	7%	56	6%
Interview completed	2220	53%	507*	52%	504	56%

8.1.4 Questionnaire development

An extensive development phase was undertaken before finalising the questionnaire and survey procedures, to ensure that the second wave of the survey captured relevant information for the FSA and that the highest possible quality of data were produced⁴².

After the second wave was commissioned, a review of the Wave 1 questionnaire was undertaken by the TNS BMRB/PSI research consortium, FSA research team and Food and You Advisory Group. This review looked at each question used in Wave 1 and considered its appropriateness for inclusion in Wave 2. The remit of the Food Standards Agency has changed since the first wave of the research, with responsibility for nutrition policy for England and Wales passing to the Department of Health⁴³. Questions on healthy eating were thus no longer relevant in these countries, and were only retained in Scotland and Northern Ireland. The review also suggested the following areas for inclusion in Wave 2: new food technologies, meat controls, the Food Hygiene Rating Scheme and handling of raw fruit and vegetables.

Following the review, a questionnaire was developed by the TNS BMRB / PSI / UoW research consortium based on the above recommendations. The new draft survey questions were cognitively tested among 62 respondents in two locations, to ascertain whether they worked as intended, and to ensure respondents were able to answer them accurately. The cognitive testing also highlighted any ambiguous question wording, which was subsequently amended.

Following the cognitive testing, a small number of draft questions were included on TNS's face-to-face Omnibus survey. In total, 1,017 interviews were conducted with adults aged 16+ on the Omnibus survey. The aims of this additional testing were to:

- Assess the distribution of responses
- Ensure that questions elicited distinct responses from people with different characteristics
- Provide an indication of whether sample sizes were adequate for sub-group analysis
- Check if the questions were providing realistic estimates (where other statistics or evidence exist which can be used to verify results)
- See whether the findings confirmed results from the cognitive testing

Finally, a pilot was conducted among 63 respondents in January 2012 to test the questionnaire and survey procedures fully.

⁴² A report commissioned by the FSA in 2010 and written by the Policy Studies Institute (PSI) looked at the feasibility of Wave 2 including questions about influences on food choice and perceptions of risk associated with food safety and diet. The report is available at: http://www.foodbase.org.uk//admintools/reportdocuments/641-1-1116_WAVE_2_DEV_FINAL_REPORT_FINAL.pdf

⁴³ On 1 October 2010, responsibility for nutrition policy (including labelling) was transferred to the Department of Health in England and to the Welsh Assembly Government in Wales. Nutrition policy in Scotland and Northern Ireland remains the responsibility of the FSA.

A revised questionnaire was produced based on the pilot findings, interviewer feedback and discussions between the TNS BMRB / PSI / UoW and FSA project teams. The final questionnaire was reviewed by the FSA and the Advisory Group.

8.1.5 Questionnaire content

The topics included in the questionnaire were as follows:

- Information about household members
- Eating habits (including eating out)
- Shopping habits
- Food safety attitudes and behaviour
- Attitudes towards food production
- Self-reported health
- Healthy eating (Scotland and Northern Ireland only)
- Demographics

Full details of the survey methodology, and a copy of the questionnaire and other survey materials, are included in the Technical Report⁴⁴.

8.1.6 Fieldwork

Interviews were carried out face-to-face, using computer-assisted personal interviewing (CAPI).

A video briefing for interviewers was produced by TNS BMRB with input from the FSA, to convey the key survey details and procedures to interviewers. The video briefing included background information on why the data was being collected by the FSA, and how the results would be used.

All sampled addresses were sent a letter in advance of the interviewer's visit. The letter gave a brief introduction to the survey and stressed the importance of taking part. The letter also stressed that all information would be kept confidential.

For addresses in Wales, the advance letter was provided in English and Welsh.

Respondents were offered a £10 incentive to encourage participation.

On average, interviews in England and Wales took 45 minutes to complete. In Scotland and Northern Ireland the average interview length was 60 minutes, owing to the additional healthy eating questions in these regions.

Interviews were carried out between late March and early September 2012.

⁴⁴ http://www.foodbase.org.uk//admintools/reportdocuments/805-1-1459_Wave_2_Technical_Report.pdf

8.1.7 Survey helpline

A freephone survey helpline was set up at TNS BMRB; the advance letter included the freephone number, which respondents could ring if they had any queries about the research. The helpline was answered during office hours by a member of the TNS BMRB research team, with an answer phone operating out of hours.

An email address was also set up, allowing respondents to get in touch with the survey team with any queries.

8.1.8 Data preparation and outputs

As main interviews were conducted via computer assisted personal interviewing (CAPI), this removed the need for data entry and routine data editing.

Where questions allowed interviewers to enter an “other” answer, these were examined to determine whether they could be back-coded into one of the pre-codes. If these answers did not fit into any of the existing codes and similar themes emerged, new codes were inserted; otherwise the answers were kept as “others”.

Respondents were asked about the industry in which they were employed and their occupation. If a respondent was not currently in employment the question was asked about their most recent job. For those with more than one job, details were collected about their main job. Where the respondent was not the Household Reference Person (HRP)⁴⁵, occupation details for the HRP were also collected.

The occupations of respondents and HRPs were coded to sub-major groups using the Standard Occupational Classification (SOC 2010).

Occupation coding was carried out using the automated coding program CASCOT⁴⁶, developed by the Institute for Employment Research at the University of Warwick.

The National Statistics Socio-Economic Classification (NS-SEC) was derived and added to the dataset.

Further details of the coding system and codes can be obtained from the Office for National Statistics⁴⁷.

An SPSS data file has been provided to the FSA and the dataset will be deposited at the UK Data Archive⁴⁸.

⁴⁵ The Household Reference Person is the sole householder or, if there is more than one, as the householder with the highest personal income from all sources. If two or more householders have the same income, the eldest is the Household Reference Person.

⁴⁶ For more information on CASCOT see <http://www2.warwick.ac.uk/fac/soc/ier/publications/software/cascot/>

⁴⁷ <http://www.statistics.gov.uk/default.asp>

⁴⁸ <http://www.data-archive.ac.uk/>

8.1.9 Weighting

Weighting was necessary to adjust for unequal probabilities of selection and also to compensate for differential non-response across survey sub-groups.

Weights were calculated separately for Scotland, Northern Ireland and England and Wales.

Design weights were applied to correct for the unequal probabilities of selection introduced by selecting one adult for interview from all adults in the household.

For the UK weight, the design weight corrected the over-representation of Scotland and Northern Ireland relative to England and Wales (as boost samples were drawn in those countries).

The achieved sample profile was compared within country with Annual Population Survey (APS) data for working status by gender and age group. In England and Wales, region was also compared.

Rim weighting was applied in Northern Ireland and Scotland with targets for working status by sex, age group and sex; in England and Wales, rim weighting used the same targets and an additional one for region.

Finally the countries were scaled to their correct proportion to calculate a combined UK weight.

Tables 8.3-8.6 show the profile of the unweighted and weighted survey samples by country and in total compared with the APS, for a range of variables.

Table 8.3 APS targets, unweighted and weighted samples – England and Wales

England and Wales	APS data		Food and You unweighted sample	Food and You sample, weighted	
	%	n	%	n	%
England and Wales	100.0	2220	100.0	2866	100.0
Working status by gender					
Men in full time work	26.9	456	20.5	772	26.9
Men not in full time work	22.0	477	21.5	631	22.0
Women in work	26.6	587	26.4	763	26.6
Women not in work	24.2	700	31.5	700	24.4
Age by gender					
Men aged 16-24	7.4	79	3.6	212	7.4
Men aged 25-34	8.4	132	5.9	242	8.4
Men aged 35-49	13.0	239	10.8	372	13.0
Men aged 50-64	11.0	244	11.0	316	11.0
Men aged 65+	9.1	238	10.7	260	9.1
Women aged 16-24	7.1	109	4.9	204	7.1
Women aged 25-34	8.2	207	9.3	236	8.2
Women aged 35-49	13.2	333	15.0	378	13.2
Women aged 50-64	11.4	301	13.6	327	11.4
Women aged 65+	11.0	336	15.1	316	11.0
Region					
North East	4.7	150	6.8	136	4.7
North West	12.5	284	12.8	357	12.5
Yorkshire & Humberside	9.6	221	10.0	275	9.6
East Midlands	8.1	172	7.7	233	8.1
West Midlands	9.8	236	10.6	280	9.8
East of England	10.5	259	11.7	301	10.5
London	14.4	249	11.2	413	14.4
South East	15.3	340	15.3	439	15.3
South West	9.6	205	9.2	275	9.6
Wales	5.5	104	4.7	157	5.5

Table 8.4 APS targets, unweighted and weighted samples – Scotland

Scotland	APS data		Food and You unweighted sample	Food and You sample, weighted	
	%	n	%	n	%
Scotland	100.0	507	100.0	275	100.0
Working status by gender					
Men in full time work	26.2	104	20.5	72	26.2
Men not in full time work	21.8	97	19.1	60	21.8
Women in work	27.4	127	25.0	75	27.3
Women not in work	24.6	179	35.3	68	24.7
Age group					
16-24	14.2	49	9.7	39	14.2
25-34	15.7	67	13.2	43	15.6
35-49	25.8	127	25.0	71	25.8
50-64	24.1	140	27.6	66	24.0
65+	20.3	124	24.5	56	20.4

Table 8.5 APS targets, unweighted and weighted samples – Northern Ireland

Northern Ireland	APS data		Food and You unweighted sample	Food and You sample, weighted	
	%	n	%	n	%
Northern Ireland	100.0	504	100.0	90	100.0
Working status by gender					
Men in full time work	26.7	81	16.1	24	26.7
Men not in full time work	22.0	100	19.8	20	22.2
Women in work	26.8	145	28.8	24	26.7
Women not in work	24.6	178	35.3	22	24.4
Age group					
16-24	15.9	61	12.1	14	15.7
25-34	17.7	82	16.3	16	18.0
35-49	26.5	127	25.2	24	27.0
50-64	21.9	132	26.2	19	21.3
65+	18.0	101	20.0	16	18.0

Table 8.6 APS targets, unweighted and weighted samples – UK

UK	APS data		Food and You unweighted sample	Food and You sample, weighted	
	%	n	%	n	%
UK	100.0		100.0	3231	100.0
Working status by gender					
Men in full time work	26.9	641	19.8	868	26.9
Men not in full time work	22.0	674	20.9	711	22.0
Women in work	26.7	859	26.6	862	26.7
Women not in work	24.5	1057	32.7	790	24.5
Age					
16-24	14.5	298	9.2	469	14.5
25-34	16.6	488	15.1	537	16.6
35-49	26.2	826	25.6	845	26.2
50-64	22.6	817	25.3	728	22.5
65+	20.1	799	24.7	648	20.1
Gender					
Men	48.9	1315	40.7	1578	48.9
Women	51.1	1916	59.3	1653	51.1
Region					
England	83.8	2116	65.5	2709	83.8
Wales	4.9	104	3.2	157	4.9
Scotland	8.5	507	15.7	274	8.5
Northern Ireland	2.8	504	15.6	90	2.8

8.2 Derivation of the index of recommended practice (RP) for food safety

Analyses in Chapter 4 of the report use a composite index of food safety practices which was developed to provide a summary of people's behaviour across a range of different practices including food preparation, storage, cross-contamination, cleanliness and use by dates. The food safety practices included in the index were selected by the FSA from all the RPs asked about in Wave 2, on the basis that if they were not followed they were most likely to increase the chance of contracting a foodborne illness. The index is a scale from 0-10, with higher numbers indicating a lower likelihood to report behaviour that was in line with Agency food safety guidance. The specific food safety questions, responses considered to be not in line with RP, and weightings used in the index are detailed in below in Table 8.7.

Table 8.7 Derivation of the RP index (part 1)

Food safety practice	Non-RP response	Weighting
Chilling		
Q4.10 How often do you or another person in your household check the temperature of the fridge?	Four times a year or less, Can't remember	+1 if any chilling practice was not in line with RP. Maximum +1
Q4.11 Thinking about fridge temperature, can you tell me how you normally check the temperature?	Any response that does not include 'check the temperature display /thermometer built into fridge', 'put a thermometer into the fridge and check'	
Q12 What do you think the temperature inside your fridge should be?	Anything higher than 8 ⁰ C, Other, Don't know	
Cooking and reheating		
Q4.1 Thinking about when you are preparing and cooking food, I would like you to tell me whether you do the following things at all when you are in the kitchen and if so how frequently; a) Cook food to steaming hot b) Eat chicken or turkey if the meat is pink or has pink or red juices c) Eat burgers or sausages if the meat is pink or has pink or red juices	a) Never, Sometimes, Don't know b)-c) Always, Most of the time, Don't know	+1 if any cooking practice was not in line with RP, +1 if any reheating practice was not in line with RP. Maximum +2
Q4.45 How many times would you consider re-heating food after it was cooked for the first time?	Twice or more, Don't know	
Q4.26 And how do you usually tell that food has been re-heated properly?	Any response that does not include 'Steam is coming from it', 'Check middle is hot' or 'Use a thermometer'	

Table 8.7 Derivation of the RP index (part 2)

Food safety practice	Non-RP response	Weighting
Cross-contamination		
Q4.1 Thinking about when you are preparing and cooking food, I would like you to tell me whether you do the following things at all when you are in the kitchen and if so how frequently; a) Use different chopping boards are used for different foods b) Wash raw meat	a) Never, Sometimes, Don't know b) Always, most of the time, Don't know	+1 for each cross-contamination practice that was not in line with RP. Maximum +2
Cleaning		
Q4.1 Thinking about when you are preparing and cooking food, I would like you to tell me whether you do the following things at all when you are in the kitchen and if so how frequently; a) Wash hands after handling raw meat/fish	a) Never, Sometimes, Don't know	+1 if any cleaning practice was not in line with RP. Maximum +1
Use by dates		
Q4.19b Which of these is the best indicator of whether food is safe to eat?	Best before date, Sell by date, Display until date, Don't know	+1 for each use by practice that was not line with RP. Maximum +4
Q22 Do you check use by dates when you are about to cook or prepare food?	Never, Don't know	
Q11.6 What is the maximum time after the use by/nest before date that you would a) Eat cooked meat	a) Any response that is not Never	
Q23a If you open <food type> and keep it stored in the fridge, what is the maximum number of days before definitely not eating/drinking it? a) Sliced cooked/cured meats b) Meat/fish/seafood pate c) Fresh dip d) Smoked fish e) Soft or cream cheese	a)– e) Three or more days, Don't know	

8.3 Regression analysis

In the section of the report (Chapter 4) that examines the index of recommended practice for food safety a logistic regression model was used to analyse the significance and contribution of a number of demographic factors in the extent to which respondents engaged in behaviours that were not in line with recommended practice. Logistic regression allows statistical associations between a response variable and a range of predictors to be explored. Logistic regression is a type of predictive model that can be used when the response variable is a categorical variable with two categories. In this study, the two were whether or not a respondent reported engaging in behaviours that were not in line with recommended practice.

Its advantage, compared to bivariate analysis, is that it allows for multiple variables to be included in the model at the same time, and therefore can model the change in overall likelihood if only one variable is changed and all others are held constant⁴⁹.

The logistic regression model was estimated using maximum likelihood methods. A forward stepwise approach was adopted, whereby the model starts with the variables used in the weighting and then tests the addition of each new predictive variable in turn. The model only adds variables which were found to improve the predictive power.

The variables included as predictors were drawn from basic socio-demographic data collected during interviews. Predictors for inclusion in the models were selected based on our analyses and/or supporting literature (Greenstreet Berman, 2011) suggesting they might be associated with a respondent being in the upper band of the index of recommended food safety practices. Only predictors that were highly collinear have been dropped from the models. Predictors included in the model are set out in the following table (8.8).

⁴⁹ Although multivariate analysis is generally viewed as more robust than bivariate analysis, it is important to note that there are a number of possible limitations with this approach. First, the variables included in the modelling generally do not explain most of the variance observed, suggesting that there were a number of other factors correlated with the dependent variable which have not been collected in the survey. Second, regression analysis runs the risk of over fitting the data. This occurs when a statistical model describes random error or noise instead of the underlying relationship.

Table 8.8 Independent variables included in the logistic regression

Independent variables	Categories
Gender	Men, <i>Women</i>
Age	16-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75+
Country	England, Wales, Scotland, <i>Northern Ireland</i>
Working status	<i>In work</i> , Retired, Unemployed, Other
Ethnicity	<i>White</i> , non-White
Household size	One, Two, Three, <i>Four</i> , Five or more
Housing tenure	<i>Owner occupier</i> , Private tenant, Social tenant, Rent-free
Kitchen facilities	<i>Having a separate kitchen</i> , Not having a separate kitchen
Dietary restrictions	<i>Vegetarian/vegan</i> , Not vegetarian/vegan <i>Religious/cultural reasons</i> , Not <i>Allergy</i> , No allergy <i>Being on a diet</i> , Not being on a diet <i>Lower supervisory/technical</i> , Higher managerial/professional, Intermediate, Small employers/own account workers, Semi-routine and routine, Never worked/unemployed
NS-SEC	<i>Aged under 6</i> , Aged under 16 (but none under 6), No children
Presence of children in the household	<i>Degree or higher</i> , A level/ Diploma/ Apprenticeship, GCSE, Other/ None
Level of education	Up to £10,399, £10,400 to £25,999, £26,000 to £51,999, <i>£52k+</i>
Household income	<i>Very good</i> , Good, Fair, Bad/Very bad
Health	<i>Own a car</i> , Do not own a car
Car ownership	Have a disability/long-term illness, <i>Do not have a disability/long-term illness</i>
Having a long-term disability or illness	
Living arrangements (relationship status);	<i>Living as a couple</i> , Not living as a couple

Note: the category in *italics* is the reference category for each variable

8.3.1 Explanation of terms

The principal output from logistic regression is an **odds ratio**. An odds ratio compares the probability of an outcome occurring if a respondent falls into one category of a predictor variable (e.g. respondents from Scotland being classified into the upper RP band) with the probability of the same outcome occurring for respondents who fall into another category of the same variable (e.g. respondents from Northern Ireland classified into the upper band), after other variables in the model were controlled for.

In calculating odds ratios, a **reference category** was selected for each variable as the category of that variable against which the odds for all other categories of that variable were compared. For example, continuing the above example, Northern Ireland was chosen as the reference category for country, and the results of the regression modelling for this variable indicate the likelihood of those from other countries being in the upper band of the index compared to respondents from Northern Ireland.

The odds ratio indicates the size of the effect, that is, by how much a variable increases or decreases the likelihood of being in the upper band of the index compared to the reference category. If the odds ratio was **less than 1**, it means that the odds of being in the upper band of the index were lower for this category than they were for the reference category. If the odds ratio was **greater than 1**, then the odds of being in the upper band were higher for this category than for the reference category. So, for example Table 8.9 indicates that respondents in Scotland have an odds ratio of 1.5 which indicates that, once all factors were controlled for, they have 50% higher odds of being in the upper band than respondents in Northern Ireland (the reference category).

The column headed '**p-value**' reports p-values from a statistical test of the true value of the predictor being zero. Values lower than 0.05 are statistically significant at the 95 per cent level. In the case of this example, the odds for Scotland reported in Table 8.9 have a p-value of 0.010. This shows that the estimate is statistically significant at the highest level.

The **Nagelkerke R²** is used to show the proportion of variability in the data that is explained by the regression model. Broadly speaking, an R² of 1 indicates that the regression line perfectly fits the data, whereas a 0 indicates that the regression model does not explain the data at all.

8.3.2 Full results of Regression Analysis

In the main report, the tables showing the results from the regression have been simplified. The full tables of results are presented below.

Table 8.9 Full results of the regression analysis (1)

	Significance level	Odds ratio	Lower 95% C.I. for odds ratio	Upper 95% C.I. for odds ratio
Gender				
Women		(1)		
Men	.000	1.538	1.298	1.822
Age				
35-44		(1)		
16-24	.064 *	1.436	.979	2.106
25-34	.169 (ns)	1.255	.908	1.736
45-54	.001	1.718	1.264	2.333
55-64	.001	1.798	1.284	2.517
65-74	.014	1.732	1.117	2.685
75+	.000	2.490	1.556	3.984
Country				
Northern Ireland		(1)		
England	.000	1.870	1.437	2.433
Wales	.671 (ns)	1.130	.644	1.984
Scotland	.010	1.525	1.107	2.099
Working status				
In work		(1)		
Retired	.994 (ns)	.999	.716	1.392
Unemployed	.014	1.552	1.093	2.202
Other	.116 (ns)	1.232	.950	1.597
Tenure				
Owner Occupier		(1)		
Private tenant	.579	.928	.713	1.208
Social tenant	.449	1.096	.865	1.388
Rent-free	.008	.390	.194	.786
Ethnicity				
White		(1)		
BME	.004	1.603	1.166	2.205
Dietary restrictions				
Partly/completely vegetarian/ vegan		(1)		
Not vegetarian	.001	2.238	1.400	3.579

Table 8.9 Full results of the regression analysis (2)

	Significance level	Odds ratio	Lower 95% C.I. for odds ratio	Upper 95% C.I. for odds ratio
Size of household				
Four		(1)		
One	.031	1.518	1.038	2.220
Two	.649 (ns)	1.087	.760	1.554
Three	.778 (ns)	1.053	.737	1.504
Five or more	.046	1.528	1.008	2.316
Separate kitchen				
Yes		(1)		
No	.046	1.376	1.006	1.883
NS-SEC				
Lower supervisory /technical		(1)		
Higher managerial /professional	.112 (ns)	1.266	.947	1.694
Intermediate	.582 (ns)	1.111	.765	1.613
Small employers /own account workers	.013	1.553	1.097	2.2
Semi-routine & routine	.089*	1.292	.961	1.737
Never worked & unemployed	.666 (ns)	1.128	.652	1.953
Presence of children in household				
Aged under 6		(1)		
Aged under 16, but none under 6	.752 (ns)	1.064	.725	1.560
No children	.621 (ns)	1.099	.757	1.596
Nagelkerke R²		0.079		

The reference category is labelled with a (1) in the odds ratio column. For each variable the odds ratio for each category was calculated by taking the ratio of the odds of someone in one category being in the upper band of the index compared to the odds of someone in the reference category being in the upper band of the index. (ns) Denotes 'not significant' at the 95% level (where the P-value was greater than 0.05). * denotes not significant at the 95% level but was significant at the 90% level (P-value between 0.05 and 0.1). Red shading indicates higher odds of being in the upper band of the index when it comes to food safety. Blue shading indicates lower odds of being in the upper band of the index.

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