Understanding domestic food safety practices

Social Science Research Unit

Food Standards Agency

FS409012

July 2014

Unit Report 28

NatCen Social Research

GSR
GOVERNMENT SOCIAL RESEARCH
Social Science in Government

NatCen
Social Research that works for society

Understanding domestic food safety practices

Authors: Caireen Roberts[1], Evie Calcutt[1], David Hussey[1], Michael Howard[2], Sally McManus[1]
[1] NatCen Social Research
[2] Kings College London
Date: July 2014
Prepared for: Food Standards Agency

At **NatCen Social Research** we believe that social research has the power to make life better. By really understanding the complexity of people's lives and what they think about the issues that affect them, we give the public a powerful and influential role in shaping decisions and services that can make a difference to everyone. And as an independent, not for profit organisation we're able to put all our time and energy into delivering social research that works for society.

The ISOTYPE illustration used on the cover of this report was designed by Gerd Arntz. The Gerd Arntz web archive is available for educational and informative purposes (http://www.gerdarntz.org/isotype).

This report has been produced by NatCen Social Research under a contract placed by the Food Standards Agency (the Agency). The views expressed herein are not necessarily those of the Agency. NatCen Social Research warrants that all reasonable skill and care has been used in preparing this report. Notwithstanding this warranty, NatCen Social Research shall not be under any liability for loss of profit, business, revenues or any special indirect or consequential damage of any nature whatsoever or loss of anticipated saving or for any increased costs sustained by the client or his or her servants or agents arising in any way whether directly or indirectly as a result of reliance on this report or of any error or defect in this report.

NatCen Social Research
35 Northampton Square
London EC1V 0AX
T 020 7250 1866
www.natcen.ac.uk

A Company Limited by Guarantee
Registered in England No.4392418.
A Charity registered in England and Wales (1091768) and Scotland (SC038454)

Contents

Key findings… 1

Executive Summary 2

Presentation and interpretation of the data 5

1 Introduction 7

1.1 Food and You survey 7

1.2 Aims of this report 7

1.3 Index of Recommended Practice 8

2 Domestic food safety practices and social and economic factors 10

2.1 IRP score by age, gender and country 10

2.2 Social and economic predictors of food safety practices 11

2.2.1 Household composition 12

2.2.2 Place…. 13

2.3 Discussion 13

3 Sources of food safety information 15

3.1 Current and future sources 15

3.2 Discussion…. 17

4 Knowledge and attitudes towards food safety 18

4.1 Knowledge of food safety and reported behaviour 18

4.2 Attitudes towards food safety and reported behaviour 19

4.3 Food price and reported behaviour 21

4.4 Novel food technologies and reported behaviour 21

4.5 Allergies and reported behaviour 21

4.5.1 Allergies and eating outside the home 22

4.6 Discussion…. 23

5 Domestic food safety practices and eating outside the home 24

5.1 Use and value of food hygiene rating schemes 24

5.2 Practices outside the home associated with practices inside the home 26

5.3 Discussion…. 27

6 Summary of findings and suggestions for further work 28

Appendix A. Index of Recommended Practice 31

Appendix B. Relationship between practices and social and economic variables 37
Appendix C. Where do people get their food safety information tables 43
Appendix D. Behaviours, knowledge and attitudes towards food safety practices 45
Appendix E. Domestic food safety practices and eating outside the home 58
Appendix F. Questions from Food and You survey 62

Key findings

Social and economic predictors of domestic food safety practices

People most likely to report food safety practices in line with FSA recommendations are:

- Women
- People aged under 65 years
- People living in Northern Ireland
- People of white ethnicity
- Those who are married or cohabiting

Furthermore, people in households with young children (under the age of five) are more likely to report practices in line with recommended food safety practice than those with older or no children.

Current and future sources of information on domestic food safety practices

Half of those who currently access information on preparing and cooking food safely, receive this information from retailers and food producers, with slightly fewer citing TV and radio, friends and family, or books and newspapers. Men and those in the oldest age group (65+ years) are most likely to say they do not currently look for information on food safety. In the future, it is likely that the internet will be an increasing source of information on food safety, particularly for those aged 16-34 years.

Knowledge and attitudes towards food safety practices

While there is likely to be a link between knowledge and reported food safety behaviour, there is little evidence of an association between attitudes and reported behaviour.

Food hygiene rating schemes

A good food hygiene rating is considered important by around a quarter of people across gender, age and county of residence. However, active use of a food hygiene rating scheme is much lower, apart from in Northern Ireland where a similar proportion value a good score and use a scheme. Use of food hygiene rating schemes declines with age - only 4% of those aged 65 years and over use food hygiene rating schemes compared with 14% of 16-34 year olds, and 10% of 35-64 year olds. This pattern across the age groups persists when frequency of eating out is taken into account – the pattern was the same for those who did and did not report eating out in the past 7 days.

Domestic food safety practices and eating outside the home

People who used a food hygiene rating scheme to check a catering outlet's hygiene standards were more likely to report behaviours which were in line with recommended food safety practice at home. Use of a food hygiene rating scheme was not related to how safe people perceived eating out to be compared to eating at home.

Executive Summary

This report presents findings from secondary analyses carried out on Food and You Waves 1 and 2 and contributes to the evidence base to improve understanding of the diversity of reported food safety practices and their association with knowledge, attitudes, dietary habits and eating outside the home.

Food and You is a biennial, random probability, cross-sectional survey of adults (16 years and over) living in private households in the UK and is commissioned by the Food Standards Agency (FSA). The survey includes many questions on reported behaviour, knowledge and attitudes relating to food safety issues in the home and when eating out.

In this report, multiple regression analysis has been carried out using a composite measure, the Index of Recommended Practice (IRP). The IRP comprises ten items on domestic food safety practice covering aspects of chilling, cleaning, cooking, cross-contamination and use-by dates, each item is allocated a score of 1 for a response in line with FSA recommended practice or 0 for responses not in line with recommended practice. Overall score is then converted to a score out of 100 and used as an outcome measure representing the extent to which respondents report practices in line with recommended practice.

This summary brings together key findings from across the report (Chapters 2-5).

Social and economic predictors of domestic food safety practices (Chapter 2)

Using the IRP, a multiple linear regression model was used to predict an average IRP score for all combinations of gender, age group (16-34, 35-64, 65+) and country (England, Scotland, Wales and Northern Ireland). Broadly, women, those aged 35-54, and those living in Wales were more likely to report practices in line with recommended practice than men, the other two age groups, and those living in the other UK countries respectively. Women aged 35-64 years and living in Wales had the highest average IRP score (73 out of 100) while men aged 16-34 years living in England had the lowest score (62 out of 100). The pattern of IRP scores by age and gender was similar across the four UK countries.

Age, gender, country, region (of England), ethnicity, marital status and household composition were all predictors of IRP score overall, even when the other factors were controlled for. Socio-economic variables such as social class, education and income were not significant predictors of IRP score.

Those with the highest scores, and therefore most likely to report following food safety practices in line with FSA recommendations, were:

- Women
- People aged under 65 years
- People living in Northern Ireland[1]
- People of white ethnicity
- Those who are married or cohabiting

[1] People living in Wales also had, on average, a higher IRP score than the reference country (England) but this was not significantly higher probably due to small numbers

Age of youngest child was a significant predictor of IRP score: households with children under the age of five had higher, on average, IRP scores than those with older or no children.

People least likely to report following food safety practices in line with FSA recommendations are men, older people (65+ years), those living in England, of non-white ethnicity (black/Asian/other), those who are not married or cohabiting or those living in households without children, particularly if an adult aged over 75 lives in the household.

Sources of food safety information (Chapter 3)

Half of those who currently accessed information on preparing and cooking food safely received this information from retailers and food producers. Slightly fewer cited TV and radio, friends and family or books and newspapers. A third (31%) said they got their information from the internet. A fifth (21%) of participants said they did not currently look for information on food safety, and these were more likely to be men and aged 65 years and over.

Of those who currently accessed information on food safety, 66% said that if they decided to look for more information on food safety in the future, they would use the internet. More people anticipated using the internet if they were to look for food safety information in the future, than did so currently. This was true for all age groups. For people aged 35 to 64 years and 65 years and over, the proportion was three times higher for future intention to access information via the internet compared with current usage. However for those aged 65 and over, this was still only a quarter (27%) of participants.

The internet was cited as an anticipated source by just over two fifths (43%) of those who did not currently access information, a key target group to reach.

Knowledge and attitudes towards food safety (Chapter 4)

Multiple logistic regression was used to test whether having knowledge in line with recommended practice predicted reporting behaviour also in line with that practice. People who did not have knowledge in line with recommended practice had higher odds of reporting behaviour which was not in line with recommended practice than those whose knowledge reflected recommended practices. Specifically:

- Those who did not know why chopping boards should be washed after preparation of meat and poultry were more likely to report using the same chopping board for different types of food.
- Those who did not know what temperature a fridge should be kept at were also less likely to report checking the temperature of their fridge.
- Those who were not aware of what indicates whether or not food is safe to eat were also less likely to report checking the use-by dates on packaged food

Multiple logistic regression was also used to examine the relationship between some attitudes towards food safety and related behaviours. The only clear pattern between level of agreement with the attitudinal statement and food safety behaviour was the more people disagreed with the statement “a little bit of dirt won’t harm you” the more likely they were to wash their fruit and vegetables before eating them raw and before cooking.

It was thought that those with a food allergy may be more likely to report behaviours in line with recommended practice. However, there was no significant association between reporting an allergy to certain foods and IRP score.

Domestic food safety practices and eating outside the home (Chapter 5)

Use of food hygiene rating schemes:

- A higher proportion of men than women reported using a food hygiene rating scheme to check a catering outlet's hygiene
- Reported usage declines with age
- Northern Ireland had the highest proportion of respondents who reported using a food hygiene rating scheme to check a catering outlet's hygiene

The importance of a good food hygiene rating:

- A higher proportion of women than men reported that a good food hygiene rating was important to them when eating out
- Wales had the highest proportion of respondents who reported that a good hygiene rating was important when deciding where to eat out

The proportion of people who reported that a good hygiene rating score was important to them when deciding where to eat out was higher than the proportion reporting actively using a food hygiene rating scheme. This pattern was reflected within gender, age group and country, with the exception of Northern Ireland where a similar proportion of respondents reported valuing a good score and using a scheme.

People who reported using a food hygiene rating scheme to check a catering outlet's hygiene standards were more likely to report domestic food safety behaviours in line with recommended practice (as indicated by a higher IRP score) than those who did not. However, reported use of a food hygiene rating scheme was not related to how safe people perceived eating out to be compared to eating at home.

Presentation and interpretation of the data

- The survey data used in this report have been weighted using survey-specific weighting variables. In the main body of the report we have presented abbreviated tables, which give a weighted percentage and a weighted and unweighted base (to show how many respondents answered the question). For each abbreviated table there is table in the appendix; the reference for this is given under the table in the main report. Similarly for any figures or models a complete data table is included in the appropriate appendix.

- The following conventions have been used in tables:
  - `-` unweighted base is less than 30
  - `[ ]` unweighted base is between 30 and 49
  - `0` non-zero values of less than 0.5% and thus rounded to zero

- Within the main report, tables and figures percentages are rounded to the nearest whole percent. Because of rounding, row or column percentages and counts may not add to the sum of each cell percentage and count.

- Not all questions are asked of all participants. For example, some questions were only asked in Wave 2. The group to whom each table refers is stated at the upper left corner of the table.

- Food and You is a cross-sectional survey which means that respondents in Wave 1 and Wave 2 are different sets of people. We have analysed both waves together and therefore we have treated the combined data as a single cross-section. As such, any associations that are described in this report cannot be interpreted in terms of cause and effect. (This is in contrast to longitudinal survey data where respondents are followed over time and changes in one measure may be attributed to changes in other measures).

- Food and You collects data on self-reported behaviour and not actual behaviour. This should be taken into account when interpreting findings.

- Descriptive cross-tabulations are used throughout the report to show the bivariate relationship between two factors without adjusting for the impact of potential confounders.

- Both linear and logistic regression analyses are used in this report:

  - Simple linear regression is used to summarise the strength of linear relationship between a scalar outcome variable (for example the Index of Recommended Practice score) and a predictor variable. That is, it tells us how much they vary together. A simple regression model can be extended to allow for multiple predictor variables, this is known as multiple linear regression. The linear regression coefficients represent the rate of change in the outcome for each unit change in the predictor variable (holding all other predictors in the model constant). A positive coefficient indicates that, as the predictor variable increases, so does the outcome variable.

  - Logistic regression is used when the outcome variable is binary (for example, whether someone follows recommended practice or not). For

each characteristic in the model there is a 'reference group' (for example, people aged 16-34) which always has an odds ratio (OR) of one. If another group (such as people aged 65 years and over) has an OR higher than one, this means that people in this group are more likely to experience the outcome than those in the reference group.

- Unless otherwise stated, the multiple regression models presented in this report, control for the following factors: age, gender, region, education level, housing tenure, household size, presence of children in household, income, marital status, ethnicity, working status, social class, religion, self-reported general health, presence of longstanding illness, index of multiple deprivation and urbanity. These are included in the model so as to isolate the effects of the predictor variable of interest on the outcome variable, taking into account all the control factors. These factors are referred to throughout as the social and economic factors. Details of these factors are given in section 2.2 and Appendix B.

1 Introduction

1.1 Food and You survey

The Food Standards Agency's (FSA) 2010-2015 strategy includes the aim of improving awareness and use of messages about good food hygiene practice at home. The FSA commissions the Food and You survey, data from which is used to monitor progress towards this aim, as well as providing general insight into domestic food safety practices.[2]

Food and You is a biennial, random probability, cross-sectional survey of adults (16 years and over) living in private households in the UK. The survey includes many questions relevant to food safety in the home and eating out. Two waves of Food and You have been conducted so far (2010 and 2012), and findings from Wave 3 will be reported in October 2014. The Food and You combined Waves 1 and 2 dataset is ideal for examining patterns and factors that predict food hygiene behaviours particularly with the development of a composite measure of reported domestic food safety practices (the Index of Recommended Practice, see section 1.2).

This report uses the Food and You Waves 1 and 2 dataset to carry out descriptive and multiple regression analyses to identify how food safety practices differ between specific subgroups in the population.

1.2 Aims of this report

Published reports for the two waves of Food and You have focused mainly on prevalence of food safety practices.[3] [4] In order to improve understanding of the diversity of food safety practices, so that messages can be better targeted both in terms of population subgroups and different food hygiene practices, the FSA identified a range of questions to be addressed in this report:

- Is there a relationship between reported food safety practices and socio-demographic or socio-economic variables? (Chapter 2)
- Where do people report getting their information about food safety? (Chapter 3)
- Is there a relationship between reported behaviours and knowledge of food safety practices? (Chapter 4)
- Is there a relationship between reported behaviours and attitudes towards food safety practices? (Chapter 4)

2 http://www.food.gov.uk/science/research/ssres/foodandyou/

3 Prior G, Hall L, Morris S & Draper A. (2011) Exploring food attitudes and behaviours: Findings from the Food and You Survey 2010. Food Standards Agency: London.

4 Prior G, Taylor L, Smeaton D & Draper A. (2013) Exploring food attitudes and behaviours: Findings from the Food and You Survey 2012. Food Standards Agency: London

- Is there a relationship between reported food practices and reported dietary restrictions? (Chapter 4)

- What is the relationship between reported food safety practices reported in and outside the home? (Chapter 5)

1.3 Index of Recommended Practice

During analysis for the Food and You Wave 2 report, a composite measure, the Index of Recommended Practice (IRP), was developed. This IRP included questions taken from the Wave 2 questionnaire covering five domains of domestic food safety practice: Chilling, Cooking, Cleaning, Cross-contamination and Use-by dates. Questions were selected because they mapped onto practices that, if not followed, were likely to increase the risk of food-borne disease. After the publication of the Wave 2 report in 2013, the FSA redeveloped the IRP as a tool that could be used to:

- Track progress towards the FSA's aim of 'improving public awareness and use of messages about good food hygiene practice at home' over the course of their 2010 – 2015 strategy and beyond
- Increase the FSA's understanding of domestic food safety practices in order to inform policy and communication strategies

This redevelopment of the IRP involved changing some questions so that the measure could track progress across Wave 1 and Wave 2 Food and You data.[5] Respondents were allocated a score according to the number of practices they reported in line with FSA recommendations.

The IRP was revised again following a peer review commissioned by the FSA to evaluate the IRP both qualitatively and quantitatively against the stated aims above. The full peer review report is available.[6] The review recommended some changes to the content and scoring of the IRP. The IRP now comprises ten items, each scored 1 for responses in line with recommended practice or 0 for responses not in line with recommended practice. Each item is derived either from individual questions or from pairs of questions or (in one case) a group of four questions. The overall score is then converted to a score out of 100, as shown in the figure below of the distribution of overall IRP scores. A higher score indicates more reported behaviours that are in line with recommended practice. Respondents answering less than half (five) of the ten items do not receive an overall score.

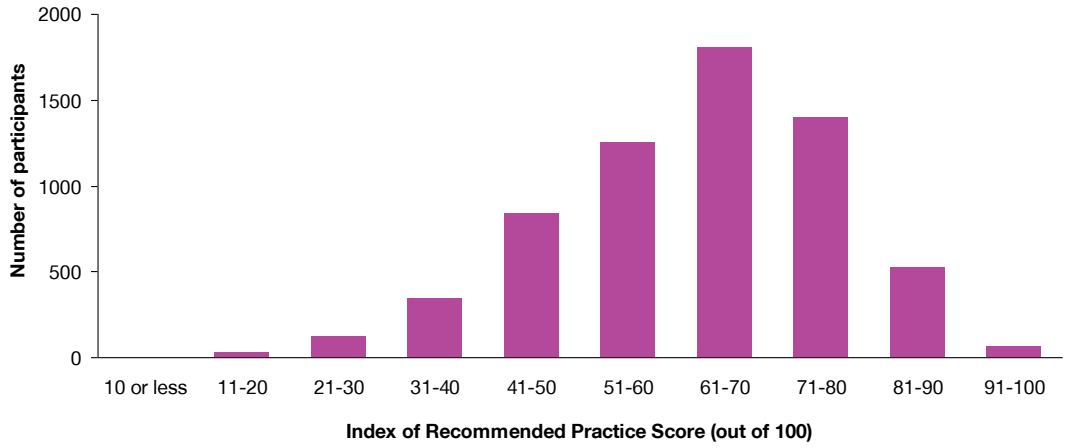
Details of the IRP used in this report and an explanation of the scoring can be found in Appendix A.

[5] Some questions on recommended practice differed across the waves. In order that the IRP could be applied across waves the questions included needed to have been used in both waves.

[6] Hussey D, Howard M, Roberts C, Inman L & McManus S (2014). Measuring domestic food safety. NatCen: London

Distribution of overall IRP scores

Base: All respondents 2010, 2012



Appendix Table A1

The median score on the IRP was 65.6.

In this report, multiple regression analysis has been carried out using the IRP as an outcome measure representing the extent to which people report practices in line with recommended practice. A range of social and economic factors and wider behaviours, such as eating outside the home, are examined in the model as predictor variables. In effect, this investigates whether the extent to which people report practices in line with recommended practice can be predicted by a range of social and economic factors and wider behaviours.

2 Domestic food safety practices and social and economic factors

This chapter is looking at the relationship between reported food safety practices and socio-demographic and socio-economic factors using the Index of Recommended Practice (IRP). It presents the factors associated with IRP score when other socio-demographic and socio-economic factors are controlled for, using multiple linear regression analysis.

2.1 IRP score by age, gender and country

Previous analysis of Food and You Wave 2 data has identified several key demographic groups that were less likely to report behaviours in line with recommended practice: men, older respondents (those aged over 45 years, particularly those aged over 75 years) and those living in England and Scotland.

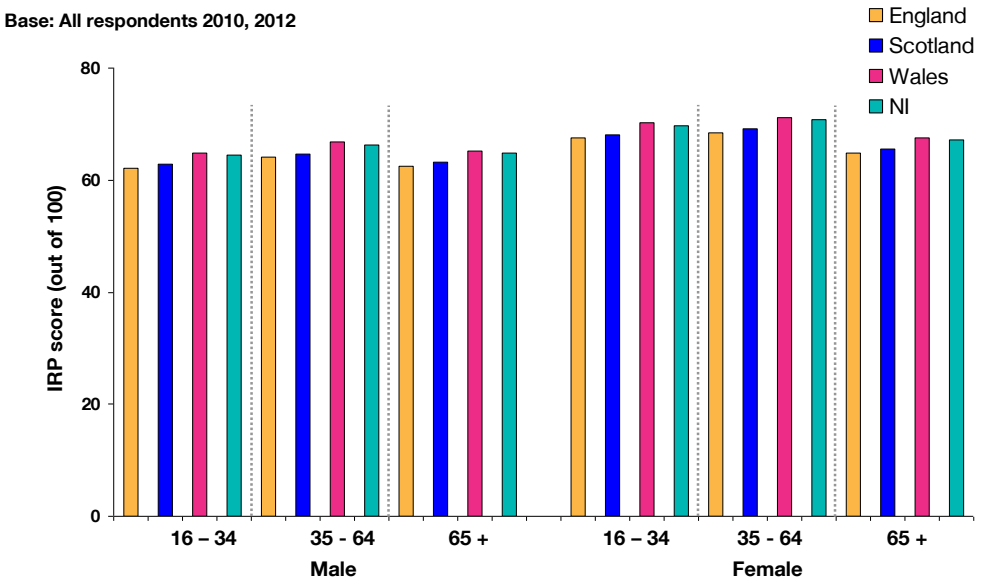
We used a multiple linear regression model to produce an average IRP score for each combination of gender, age group and country. This approach allows us to generate a regression-smoothed score for someone who is, for example, male, aged 16-34 years and living in Northern Ireland.[7] These were used to compare such demographic groups in terms of their likelihood of reporting behaviours in line with recommended practice.

In Appendix B, Table B1 presents the results from the regression model and Table B2 shows the regression-smoothed IRP scores for each combination of age, gender and country.

Broadly, women were more likely than men to report behaviours in line with recommended practice. Those aged 35-64 were more likely than those in the other two age groups to report behaviours in line with recommended practice, and people living in Wales were more likely than the other UK countries to do so. The practices reported by women aged 35-64 years and living in Wales had the highest regression-smoothed IRP score (73 out of 100) while the practices reported by men aged 16-34 years living in England had the lowest regression-smoothed score (62 out of 100). We found the pattern of IRP score by age and gender to be similar across the UK countries.

[7] Regression-smoothed means have been presented by age, gender and country rather than directly measured mean scores, due to some small sample sizes.

Regression-smoothed IRP score by age, gender and country



Appendix Tables B1 & B2

It was hypothesised that the amount of food preparation people do would affect their IRP score. For example it was suggested that fewer men are responsible for cooking or preparing food and although they may report behaviours which are not in line with recommended practice, they are less likely to expose themselves and others to food borne illness through their domestic food safety practices than someone responsible for cooking and preparing food reporting the same practices. This was investigated by adjusting the model in Table B1 to control for whether people ever cooked for themselves or others. This variable was found to be non-significant, suggesting that within these demographic groups the IRP score did not vary according to whether people ever cook for themselves or others.

2.2 Social and economic predictors of food safety practices

Bivariate analysis was used to identify socio-demographic and socio-economic factors that were significantly associated with IRP score. A multiple linear regression model was built to determine which of those factors remained significantly associated with IRP score after controlling for the other social and economic factors. Table B3 in Appendix B presents the results from the regression model. Significant predictors of IRP score are discussed below. For a full list of the variables tested, including the factors that were not found to be significant predictors of IRP score when other factors were controlled for, see Table B3. All the variables in this model form the group of social and economic factors which are controlled for in the other regression models.

The following variables were significantly associated with the IRP (after controlling for the other social and economic factors):

- **Age and Gender**: Men were less likely to report behaviours in line with recommended practice than women, and older people (65+ years) were less likely to report practices in line with recommended practice than the other age groups. Women under the age of 65 were more likely to report behaviours in line with recommended practice, compared with men in the youngest age group (16-34) (as indicated by a significantly higher IRP score of an average 5.0-5.2 points out of 100). Interestingly, older women (aged 65 and over) did not have a significantly different IRP score compared with young men, suggesting that their reported behaviours were similar in terms of whether or not they were in line with recommended practice.
- **Region**: regional differences persist when the other social and economic factors are controlled for, with people living in the North West, East Midlands and Northern Ireland all reporting behaviours which were more in line with recommended practice than those living in London (see section 2.2.2 for further discussion).
- **Ethnicity:** white participants were more likely than those of non-white (black/ Asian/ other) ethnicity to report practices which were in line with recommended practice (as indicated by a significantly higher IRP score of an average 5.5 points out of 100).
- **Marital status:** married participants (or those living as married) were more likely than those who were not married (single/widowed/divorced) to report practices in line with recommended practice (as indicated by a significantly higher IRP score of an average 1.9 points out of 100).

The following variables were not significantly associated with the IRP score (after controlling for the other social and economic factors):

- Education
- Self-reported health
- Housing tenure
- Household size
- Presence of children in the household
- Income
- Socio-economic classification
- Work status
- Religion
- Disability
- Urbanity
- Area level of deprivation

While working status was not significantly associated with IRP score overall, those in work were more likely than those who were unemployed to report food safety practices in line with recommended practice.

How each of these variables was defined is described in Table B3.

Appendix Table B3

2.2.1 Household composition

Overall, neither household size nor presence of children in the household predicted the extent to which reported behaviours were in line with recommended practice (as measured by the IRP) in the main regression model. However, there is interest in exploring any potential relationship with household composition in more detail, in

particular factoring in the age of the youngest child in the household. A separate model was run (see Table B4 in Appendix B) which included a derived variable reflecting different types of household composition and all the factors in the original model.[8]

After controlling for the social and economic factors, households with at least one adult aged over 75 and no children were the least likely to report practices in line with recommended practices. In general, households with children were more likely to report recommended practices than those without. Households with at least one child aged under 5 were more likely to report behaviours in line with recommended practice than other households (as indicated by a significantly higher IRP score of an average 2.2 points out of 100) (see Table B5 in Appendix B).

Appendix Tables B4 & B5

2.2.2 Place

The model in Table B3 in Appendix B includes a variable for region, which is broken down according to English region, Scotland, Wales and Northern Ireland. In addition to this model, two further regression models were run, to allow comparison of IRP score firstly by country (Tables B6) and secondly within English regions (Table B7). People in England were least likely to report behaviours in line with recommended practice (as indicated by IRP score), while those in Northern Ireland were most likely to report behaviours in line with recommended practice. The extent to which respondents reported practices in line with recommended practice varied across England; respondents in the North West and East Midlands were, on average, more likely to report behaviours in line with recommended practice than respondents in London.

Appendix Tables B6 & B7

2.3 Discussion

The results of the multiple regression models in Appendix B indicate that age, gender, country, region, ethnicity, marital status and household composition are all significant predictors of the extent to which reported behaviours are in line with recommended practice (as measured by the IRP score), even when the other social and economic factors are controlled for. This is broadly supported by an evidence review of the public's food safety practices in the home that found associations between age, gender, household type, education, income and household status with food safety attitudes and behaviours.[9] However in our multiple regression models most of the socio-economic measures available on the dataset – including social class, income, working status, education, housing tenure, level of deprivation and urbanity - were not found to be significant predictors of the extent to which respondents were likely to report practices in line with recommended practice. It may be that questions about debt could be included in future waves of Food and You.

While working status may not have been significant overall, unemployed people did appear to, on average, report food safety practices which were less in line with recommended practice than those in work. This may be a key issue in the current economic climate.

[8] Age of participant, household size and presence of children were not included in the model because they are closely correlated with the household composition variable.

[9] Greenstreet Berman (2011). Food safety behaviours in the home. Final report for the Food Standards Agency CL2351 R4 V6 FCA. London: FSA

Presence of children was not significant overall in the main model, however when age of youngest child was factored in, households with children under the age of five were, on average, more likely to report food safety practices in line with recommended practice. The Greenstreet Berman (GSB) evidence review identified similar patterns across studies in relation to household type with households containing children being more likely to follow recommended practice, particularly where children were young. The presence of children may confer some benefit perhaps because parents have greater knowledge and awareness of food safety in the home through advice from doctors and other health professionals. They may also appreciate specific vulnerabilities of young children to food borne illness. Longitudinal data would allow us to see the changes in recommended practice that occur through the life course e.g. as children grow up, and whether food safety practices stay with parents.

Young men and older people have previously been identified as less likely to report behaviours in line with recommended practice and the results presented above support this. For the following chapters we have, where appropriate (and numbers allow), looked at differences by the three key significant predictors: age, gender and country.

3 Sources of food safety information

This chapter focuses on sources of information on domestic food safety and how this differs between population sub-groups.

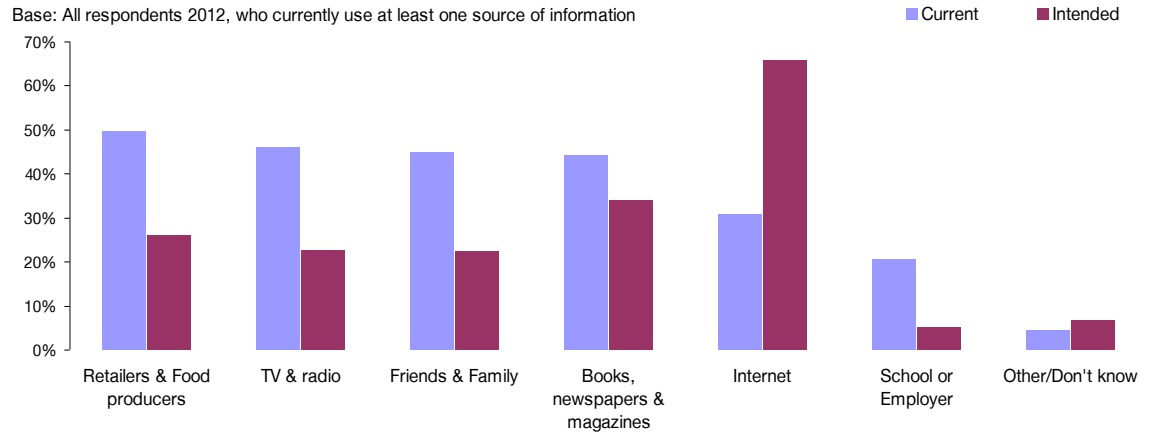
3.1 Current and future sources

Participants were shown a list of possible sources of information about how to prepare and cook food safely and asked if they currently got information from any of them. They were then asked which sources they would use in the future if they decided to look for more information about how to prepare and cook food safely. For the full question see section F.1, Appendix F. A fifth (21%) of participants said they did not currently look for information on food safety. These respondents were more likely to be men and aged 65 years and over.

Appendix Table C1

Analysis was first performed on the participants who currently accessed at least one source of information about how to prepare and cook food safely. Half said they currently got their information from retailers and food producers, with slightly less than half citing TV and radio, friends and family or books and newspapers. A third (31%) said they got their information from the internet.

Sources of information about how to prepare & cook food safely



Note: Participants could give more than one source

Appendix Table C2

Of those who currently accessed information on food safety, 66% said that if in the future they decided to look for more information about food safety they would use the internet. The proportion of people who reported that they would use the internet to find out how to prepare and cook food safely in future, should they decide to look for this information, was higher in all age groups than the proportion who currently got information from the internet. For people aged 35 to 64 years and 65 years and over, the proportion was approximately 2.5 times higher for future as compared with current usage. However for those aged 65 and over a smaller proportion reported using the internet now or in the future compared with other age groups, with only a third (30%) of participants aged 65 and over saying they would use the internet in future and 12% reporting that they currently used the internet for food safety information.

Table 3.1 Proportion of respondents anticipating using the internet to look for information by age group			
Base: All respondents 2012, who currently use at least one source of information	16-34 years	35-64 years	65+ years
	%	%	%
Current	43	29	12
In the future	79	69	30
Unweighted base	*666*	*1303*	*512*
Weighted base	*852*	*1267*	*429*

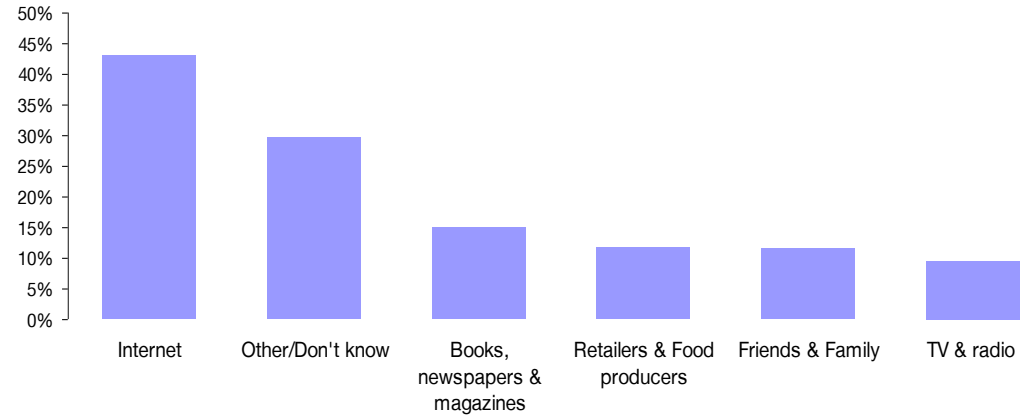
There is a similar difference in the proportion of men and women who reported that they would use the internet to look for food safety information in the future, if they decided to look for this information, compared to the proportion who reported currently getting information from the internet. A similar pattern was also observed for all four UK countries.

Appendix Tables C3 & C4

The following analysis is restricted to participants who said they currently do not access any sources of information about how to prepare and cook food safely. Of these, 43% said they intended to use the internet if they were to look for information in the future and 30% said they would either use 'other' sources[10] or they didn't know what sources they would use.

Anticipated future sources of information for those who do not currently use any sources

Base: All respondents 2012, who do not currently use any sources of information



Note: Participants could give more than one source

Appendix Table C5

[10] 'Other' includes Doctor/GP and Common sense/Personal experience

3.2 Discussion

If respondents decided to look for information on food safety in the future, the results suggest more people would use the internet to get this information than more traditional sources such as retailers and food producers, TV and radio, and friends and family. Where people learn the basic principles of cooking and food safety may influence where they get their food safety information from now and in the future. The "Kitchen Life" study, a qualitative study on domestic kitchen practices found that, alongside official and 'expert' sources, there were those principles that had been 'absorbed' from family and friends.[11] The next wave of Food and You includes new questions that ask in which ways participants learn about cooking and food safety and will provide more understanding on the influence these have on how people gain their knowledge and awareness of food safety in the home. As we saw in the previous chapter, presence of younger children in a household is linked with a higher likelihood of reporting practices which are in line with recommended practice. It would be helpful to have a separate category to see if participants learn food safety from their children (through school, clubs), from access to services that come about through having children (such as health visitors and contact with childcare providers and school staff) and whether they retain good practices as children grow older.

It is interesting that a quarter of older people said they would use the internet in the future if they needed further information about preparing and cooking food safely, compared with 12% who currently use the internet for this purpose. This corresponds with a general increase in internet usage among older consumers.[12] [13] However it is important not to focus on the internet as the only conduit for food safety messages, particularly when targeting older people, as this source was still cited as an intended source of food safety information only among a minority of older people.

Furthermore, while these results identify the internet as an important channel for communicating food safety messages to a wide audience, it does not capture how consumers are using the internet so they can be better targeted. Further insight into whether people actively look for food safety information or whether they come across such information when looking at websites focused on other food related issues would complement these results. Posting food safety information on web pages featuring recipes or take-away ordering details is one way to tailor information to target audiences.

[11] Wills W, Meah A, Dickinson A & Short F (2013). Domestic Kitchen Practices: Findings from the "Kitchen Life" Study. Food Standards Agency, London

[12] http://www.pewinternet.org/2014/04/03/older-adults-and-technology-use/

[13] Office for National Statistics (2013). Statistical Bulletin: Internet Access - Households and Individuals, 2013.

4 Knowledge and attitudes towards food safety

This chapter begins by looking at the association between knowledge and related domestic food safety behaviours while controlling for other factors, using multiple logistic regression analysis. It then goes on to look at the association between attitudes to food safety and behaviours while controlling for other factors. It also explores other areas that may influence food safety behaviour, namely food price, perceived knowledge of novel foods and having a food allergy.

4.1 Knowledge of food safety and reported behaviour

Both waves of the Food and You questionnaire include a small number of knowledge questions. It was hypothesised that respondents whose knowledge relating to particular food safety behaviours was in line with recommended practice were more likely to report behaviours in line with the associated recommended practice. Table 4.1 shows three knowledge questions and the related food safety behaviour.

Table 4.1 Related knowledge and behaviour questions

Appendix Table	Food safety knowledge	Food safety behaviour
D1	What is the reason for washing the chopping boards after preparing meat or poultry	Use different chopping boards for different foods
D2	Temperature the inside of a fridge should be	Check the fridge temperature
D3	What indicates if food is safe to eat	Check use by dates

Three multiple logistic regression models were run, controlling for social and economic factors (see Appendix D Table D1 to D3). For each model, we tested whether **those who did not have the relevant knowledge had higher odds of reporting behaviour which was not in line with recommended practice**.[14] Or in other words, whether knowledge in line with recommended practice predicted reporting a behaviour which was also in line with recommended practice. In all three models, people whose knowledge did not reflect recommended practice had higher odds (than those whose knowledge did reflect recommended practice) of not behaving in line with recommended practice.

- People who did not know why it is recommended to wash chopping boards after preparation of meat and poultry had 2.3 times the odds of reporting using the same chopping board for different types of food.

[14] As behaviour is self-reported behaviour and not actual behaviour, to account for any bias we ran the models so that the outcome was food safety behaviour **not** in line with recommended practice.

- People who did not know what temperature a fridge should be kept at had 1.8 times the odds of reporting not checking the temperature of their fridge.
- People who were not aware of what indicates whether or not food is safe to eat had 1.8 times the odds of reporting not checking the use-by dates on packaged food.

Appendix Tables D1 to D3

It is important to note that the responses provided to the questions used in these analyses in particular may be confounded by social desirability bias: people are more likely to report the behaviour that they believe to be 'correct' (whether that reflects their actual behaviour or not) and this is underpinned by their knowledge of what is 'correct'. To help limit the effect of this bias, the above analyses were run to look at food safety behaviour which was not in line with recommended practice. This issue should however be kept in mind when interpreting these results.

4.2 Attitudes towards food safety and reported behaviour

Participants were asked about their level of agreement with a series of statements about food safety. It was hypothesised that people with more relaxed attitudes to food safety were less likely to report behaviour in line with recommended practice. In particular we looked at the associations between four specific attitudinal statements and related behaviours. These are outlined in Table 4.2.

Twelve multiple logistic regression models were run, controlling for social and economic factors (see Appendix D Table D4 to D14), to examine the relationship between each of these four attitudinal statements and each of the related questions on food safety behaviour. The relevant food safety behaviour was the outcome in each model.

In some cases, the attitude was found to be significantly associated with one of the food safety behaviours. For example, Table D4 shows that the behaviour of eating chicken or turkey if the meat is pink, varied significantly according to the response to the attitude statement, "I am unlikely to get food poisoning from food prepared in my own home". However, the pattern to the odds ratios for the levels of agreement with the statement was not clear. Those who 'definitely agreed' that they were unlikely to get food poisoning from food prepared at home had significantly (or almost significantly) higher odds of not eating pink chicken or turkey than those who 'tended' to agree or definitely disagreed. However, the odds ratios for these two groups were very similar to each other (0.555 and 0.528), and those who 'tended to disagree' with the statement did not differ from the reference category at all. This suggests that the statistical finding could be a chance occurrence, rather than an informative result. The same conclusions are drawn for any significant results in Tables D5 to D10.

The model output in Tables D11 to D14, however, provided an interesting and consistent result in that the more people disagreed with the statement "a little bit of dirt won't harm you" the higher the odds that they reported washing their fruit and vegetables before eating them raw and before cooking.

Appendix Tables D4 to D14

Table 4.2	Relationship between food safety attitudes and behaviours	
Appendix Table	**Attitudinal statements**	**Food safety behaviour**
D4	I am unlikely to get food poisoning from food prepared in my own home	Eat chicken or turkey if the meat is pink
D5		Check their fridge temperature
D6		Keep a packet of sliced cooked or cured meat in the fridge for longer than recommended once opened
D7	I often worry about whether the food I have is safe to eat	How long they kept a packet of meat, fish or seafood pâté in the fridge once they have been opened
D8	People worry too much about getting food poisoning	How long they kept a packet of fresh dip in the fridge once they have been opened
D9		How long they kept a packet of smoked fish in the fridge once they have been opened
D10		How long they kept a packet of soft or cream cheese in the fridge once they have been opened
D11	A little bit of dirt won't harm you	Wash fruit before eating raw
D12		Wash fruit before cooking
D13		Wash vegetables before eating raw
D14		Wash vegetables before cooking

4.3 Food price and reported behaviour

Participants were asked about their level of agreement with a series of general statements about food including 'The price of food means that I often don't buy the food I would like to'. For details of the question asked, see section F.2, Appendix F. It was hypothesised that constraints on food budget and/or choice may have a negative impact on food safety practices particularly in relation to use-by dates. A logistic regression model, controlling for the social and economic factors (see Appendix B Table D15) did not find a significant association between the level of agreement with the statement on food price and reported checking of use-by dates. However, participants who definitely agreed with the statement were less likely to check use-by-dates than participants who gave any other response.

Appendix Table D15

4.4 Novel food technologies and reported behaviour

Participants were shown a list of new food technologies: animal cloning, genetic modification, irradiation and nanotechnology and asked if they considered themselves knowledgeable about them. For details of the question asked, see section F.3, Appendix F. It was hypothesised that those who considered themselves to be knowledgeable about novel food technologies were more likely to report behaviour in line with recommended practice. Four linear regression models were run, controlling for the social and economic factors (see Appendix D Table D16), one for each food technology, with overall IRP score as the outcome variable. Only knowledge of genetic modification was significantly associated with IRP score, however there was no clear pattern to the regression coefficients which suggests that the statistical finding is a chance occurrence. We can therefore conclude that, overall, perceived knowledge of novel food technologies does not appear to strongly predict either reporting practices which are, or are not, in line with recommended food hygiene practice.

Appendix Table D16

4.5 Allergies and reported behaviour

Participants were asked if their eating habits or diet were restricted in any way (for instance by allergies, medical conditions, or ethical or religious views). For details of the question asked see section F.4, Appendix F.

In total, 5% of participants reported being allergic to certain foods. It was hypothesised that people who reported food allergies would be more likely to behave in line with recommended practice, for example they may be more aware of cross contamination risks due to having to avoid contact with the food they are allergic to. Linear regression was used to test for any link between having an allergy and overall IRP score, controlling for the social and economic factors (see Appendix D Table D15).

There was no significant association between reporting a food allergy and whether reported behaviours were in line with recommended practice (as measured by the IRP). This may be because those with allergies avoid having that type of food in the house altogether, meaning they do not have to be more careful about cross contamination than a person without an allergy. It is also important to note that the question only asks about the participant themselves rather than anyone else in the household, for example a child, and it does not ask whether the allergy has been clinically diagnosed. As such, what is classed as an 'allergy' in this dataset could instead be a food intolerance, or a choice to avoid specific foods for a perceived benefit. The next wave of Food and You includes new questions that ask if anyone in

the household has a food allergy and whether any allergies have been clinically diagnosed.

Appendix Table D17

4.5.1 Allergies and eating outside the home

It was thought that respondents with allergies may eat out less than those without an allergy, in order to avoid situations where there is a greater risk their food could become contaminated with the ingredient they are allergic to. Of the participants who reported being allergic to certain foods, 73% had eaten out in the previous 7 days. This is the same proportion as for those without allergies, suggesting that there is no association between reporting a food allergy and likelihood of eating out. However, the issues raised previously about self-reported allergy may also have an influence. It should also be noted that the number of respondents who report having a food allergy are small.

Table 4.4 Allergies and eating out

Base: Third of respondents 2010, all respondents 2012	Do you have a food allergy?	
	Yes	No
	%	%
Eaten out in the last 7 days	73	73
Unweighted base	*201*	*4061*
Weighted base	*198*	*4076*

It was hypothesised that people who reported having a food allergy would be more likely to say that a good food hygiene rating was important to them when deciding where to eat out. This was underpinned by an assumption that people with allergies would be more likely to be concerned about cross-contamination and think that catering outlets with a good hygiene rating would be more likely to follow guidance on other aspects of providing safe food.

A third (32%) of participants with food allergies valued a good food hygiene rating compared with a quarter (25%) of those without. Although this difference was not statistically significant, across both waves there was a higher proportion of people with allergies valuing a good food hygiene rating when eating out. This suggests that although a pattern exists, the sample size (198 for Waves 1 and 2 combined) was not large enough for this to be identified as statistically significant. Wave 3 data will provide an opportunity to investigate this pattern further.

Table 4.4 Allergies and food hygiene ratings

Base: Third of respondents 2010, all respondents 2012	Do you have a food allergy?	
	Yes	No
	%	%
Good hygiene rating/score is important	32	25
Unweighted base	*201*	*4061*
Weighted base	*198*	*4076*

4.6 Discussion

In summary, the results in this chapter show a clear association between food safety knowledge and related reported behaviours, but a less clear - or no - association between attitudes and behaviours.

The data shows that people who do not report knowledge which is in line with recommended domestic food safety practice will also be less likely to report associated behaviours in line with recommended practice, for example, those who did not know why it is recommended that chopping boards are washed after preparation of meat and poultry were also more likely to use the same chopping board for different types of food. Conversely, the data also suggests that people who know recommended practice are also more likely to report behaving in line with that practice. This could reflect social desirability bias, that is, this group of people knew what the 'correct' behaviour was that they were 'meant' to report. We cannot say for certain that it is the lack of knowledge that is driving the practice which is not in line with recommended practice. However, this association does support the idea that food hygiene information that describes best practice and also conveys the reasons why that practice is recommended could be more useful than information which only outlines recommended practices and does not provide the underpinning reasoning behind these practices. These associations suggest that food safety information should be covered in a comprehensive way, and that sources of information about preparing and cooking food safely should cover both practice and the scientific basis for that practice.

There are two different types of knowledge:

- Knowledge that is necessary for a particular food safety practice to happen (e.g. need to know the recommended fridge temperature in order to check it)
- Knowledge that provides a rationale for why particular food safety practices are recommended (e.g. what are the implications of eating food past its sell-by date).

It is clear that the first is an essential component for food safety information campaigns, however these results indicate that the latter are also important to support change in behaviour.

The GSB evidence review of public food safety practices in the home found many studies that indicated the relationship between knowledge and behaviours was influenced by "risk awareness, perceptions of risk and 'optimism bias'.[15] There are no questions in Food and You that quantify these three factors and capturing them may be helpful in understanding their influence on knowledge and behaviour. Guidance is available on how to identify and include relevant psychological factors[16] and questions could be developed in conjunction with a review of current literature/studies.

[15] 'Optimism bias' is a psychological construct referring to the tendency to view others as being at greater risk than oneself.

[16] http://www.natcen.ac.uk/media/2862/question-design-toolkit.pdf

5 Domestic food safety practices and eating outside the home

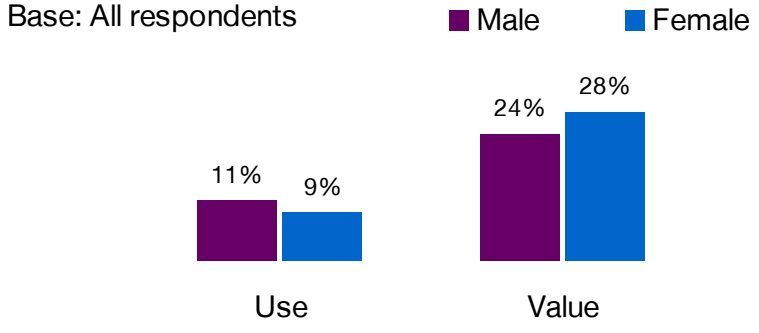
This chapter focuses on reported eating outside of the home (including eating takeaways). Topics covered include the importance placed on a good hygiene rating and the use of food hygiene rating schemes, and whether concerns about the safety of food outside the home is associated with use of food hygiene rating schemes. This chapter also looks at whether the extent to which people report practices in line with recommended practice differs between those who are concerned about the safety of food outside the home and those who are not.

5.1 Use and value of food hygiene rating schemes

Participants in Wave 2 (2012) were shown a list of factors and asked what was important to them when deciding where to eat out. For details about this question see section F.3, Appendix F. One of the options was a good hygiene rating/score and this was used as a measure of whether people valued, in general, a good hygiene rating / score. Participants were later shown images of certificates and stickers for the Scotland Food Hygiene Information Scheme (FHIS), England, Wales and Northern Ireland Food Hygiene Rating Scheme (FHRS) and the Scores on the Doors (SoTD) and asked if they had used any of these in the last 12 months to check an establishment's hygiene standards before deciding to visit.[17] For the full question see section F.5, Appendix F. We used this question as a measure of whether people *used* a food hygiene rating scheme. Participants reporting that a good hygiene rating/score was important to them did not necessarily know about or use specific schemes.

Men were slightly more likely than women to report using a food hygiene rating scheme, while women were slightly more likely than men to report valuing a good rating.[18]

Use and value of food hygiene rating schemes by gender



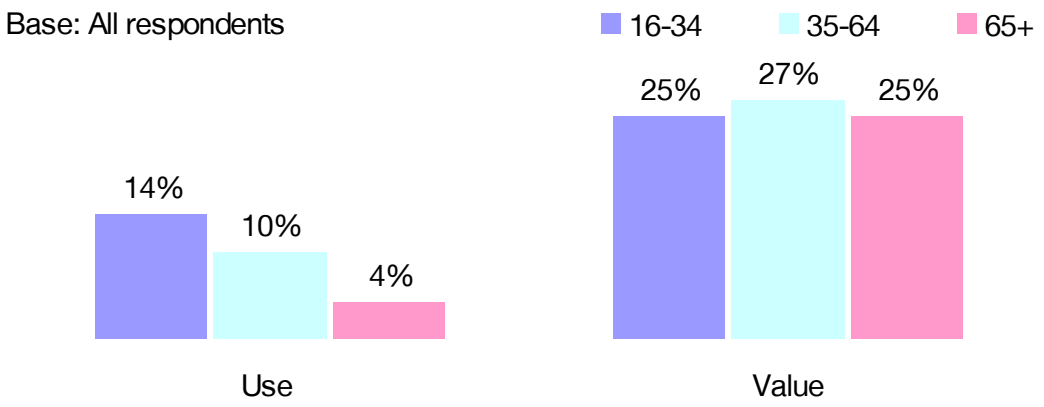
Appendix Tables E1 & E2

[17] Food businesses are given these stickers/certificates and encouraged to display them where they can easily be seen or consumers can view them on the Food Standards Agency's websites

[18] In analyses that did not control for the social and economic factors.

The proportion who reported using a food hygiene rating scheme decreased with age, while a similar proportion in each age group reported valuing a good rating/score.

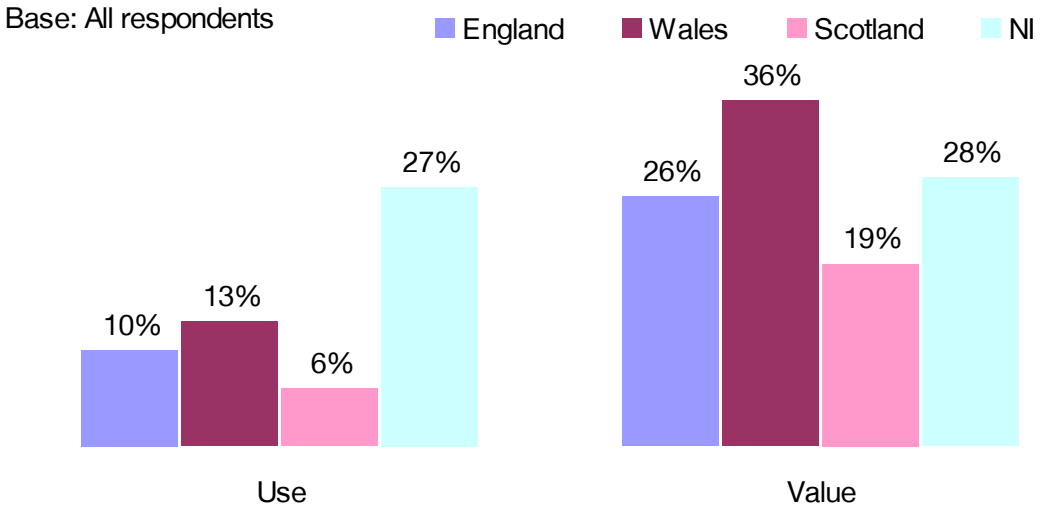
Use and value of food hygiene rating schemes by age



Appendix Tables E3 & E4

People in Northern Ireland were much more likely than those living in other UK countries to report using a food hygiene rating scheme, while those in Wales were the most likely to report valuing a good rating or score.

Use and value of food hygiene rating schemes by country



Appendix Tables E5 & E6

The proportion of people that said a good hygiene rating score was important to them when deciding where to eat out was higher than the proportion that reported actively using a food hygiene rating scheme. This pattern was reflected within gender, age group and country of residence, with the exception of Northern Ireland where a similar proportion of respondents valued a good score and used a scheme. However, reported use of a scheme and value of a good score could be confounded by how often people eat out. As there is no direct question on frequency of eating out in Wave 2 we looked at whether a participant reported eating out in the last 7 days to control

for eating out.[19] However the patterns seen above were the same both among those that had reported eating out, as well as those that reported not eating out in the last 7 days (see Tables E1-E6 in Appendix E).

5.2 Practices outside the home associated with practices inside the home

It was hypothesised that people who thought eating outside of the home was less safe than eating at home would be more likely to use a food hygiene rating scheme. However there was no difference in the proportion of participants who reported using a food hygiene rating scheme based on whether they felt eating outside of the home was more or less safe than eating at home.

Table 5.1 Food safety outside and using food hygiene rating schemes

Base: All respondents 2012	When eating out, how safe is the food compared to at home?		
	More safe	About the	Less safe
	%	%	%
Used a food hygiene rating scheme when eating out	12	8	12
Unweighted base	*175*	*1337*	*1420*
Weighted base	*178*	*1301*	*1430*

It was also hypothesised that people who think eating outside of the home is less safe than eating at home would be less likely to report behaviours in line with recommended practice at home because they perceive themselves to be at a lower risk in their own home. Linear regression was used to test this hypothesis controlling for the social and economic factors (see Appendix D Table D1), with overall IRP score as the outcome variable. This found that people who felt eating out was less safe were in fact more likely to report practices in line with recommended practice than those who felt it was safer (as indicated by a significantly higher IRP score by an average of 5.9 points out of 100).

The results showed that use of a food hygiene rating scheme is not related to how safe people perceive eating out compared to eating at home, it was hypothesised that people who do not use a food hygiene rating scheme would be less likely to report behaviours in line with recommended practice. Again linear regression was used to test this hypothesis, with overall IRP score as the outcome variable controlling for the social and economic factors (see Appendix D Table D1). People who reported using a rating scheme were found to be more likely to report practices in line with recommended practice than those who didn't (as indicated by a significantly higher IRP score by an average of 4.8 points out of 100).

Appendix Table E7 & E8

[19] We acknowledge that eating out in the last 7 days does not adequately categorise participants' frequency of eating out but is used as an indication in the absence of a more accurate measure

5.3 Discussion

While the results suggest that valuing a good hygiene rating does not translate into actively using one, it is important to note the context in which these questions were asked. Importance of a good hygiene rating was one of many factors on a list while reported use of a food hygiene rating scheme was an explicit question.

Even with this in mind, it is important to know why value is not being reflected in active usage of food hygiene rating schemes. Is it that the scheme itself is not publicised enough or that it is not easy for consumers to access the information? More importantly, do food hygiene ratings influence consumers' decisions about where they eat? Answering these questions is currently beyond the scope of Food and You. However the FSA has commissioned an evaluation of the schemes whose aims include providing an assessment of 'consumer awareness and understanding of the FHRS and FHIS' and 'the impact of the FHRS and FHIS on consumer behaviour'.[20] Insight from this evaluation could inform questions for future waves of Food and You allowing ongoing monitoring of the success of the schemes in reducing the incidence of food-borne illness.

Also, while it is currently voluntary in England, Scotland and Northern Ireland for businesses to display their hygiene ratings, it has been mandatory in Wales since 2013. The next wave of Food and You may show the impact of mandatory display in Wales and whether this should be adopted in all UK countries. However, the results show that in Northern Ireland, where hygiene rating displays are still voluntary, a similar proportion use a scheme and value a good score, and reported use of a scheme is higher in Northern Ireland than in the other UK countries. It is likely that this could be due to the different levels of promotional activity surrounding the scheme undertaken in each country. The launch of FHRS in Northern Ireland was accompanied by a high level of promotional activity, including TV advertising. Establishments in Northern Ireland also have a higher level of display of ratings than those in England and Wales. The promotional activity surrounding the scheme has been lower in Wales and England. However, while successful in Northern Ireland, it is not necessarily the case that replicating the level of promotional activity in the other countries would produce the same results due to other differences between the countries.

There seems to be a link between perceiving eating out as less safe and being more likely, on average, to report practices in line with recommended practice. Similarly those reporting using food hygiene rating schemes are more likely to report practices in line with recommended practice. This could suggest that those who are more concerned about food safety in their own home also report using food hygiene rating schemes as they are generally concerned about food safety. Alternatively it could be argued that using a food hygiene rating scheme when deciding where to eat out results in a raised awareness of food safety in general, which could then translate to changes in domestic food safety practices. The cross-sectional nature of the analysis means it is not possible to infer causality, only to establish the associations.

Once Wave 3 data is included into the analysis we may also have the numbers to be able to look at the links between other socio-demographics and use of food hygiene rating schemes, such as household type and presence of children in the household.

[20] http://www.food.gov.uk/science/research/ssres/foodsafetyss/fs244011/

6 Summary of findings and suggestions for further work

This report has addressed a number of questions raised by the FSA to help better understand the relationship between domestic food safety behaviour and other factors such as socio-demographics, socio-economics, knowledge, attitudes and practices outside the home. It adds to the body of research that attempts to answer two key questions about delivering food safety messages to the population: who to target and how.

To decide who to target, there are two main approaches: to target those who are at greater risk of food-borne illness but may be less receptive to messages or less flexible in their practices, and to target those who may be more receptive to messages and where impact on behaviour may be greatest. However, the authors of "Kitchen Life" cautioned that, as practices are not fixed and are subject to change with life events (for example, pregnancy or bereavement), those individuals or households who might be identified as 'at risk' change frequently.

In summary, the findings of this analysis suggest that:

- Those least likely to report practices in line with recommended practice are:
    - Men
    - Older people (65+ years)
    - People living in England
    - Those who are not white (black/Asian/other)
    - Those who are not married or cohabiting
    - People living in households without children, particularly those households with an adult aged over 75.

- Young men and older women are groups who are likely to report practices which are not in line with recommended practice, it could thus be beneficial to target these groups with food hygiene information

- The FSA should anticipate, and plan for, the internet becoming a key source of information on food safety in the future, particularly for those aged 16-34 years. However the internet continues to exclude some of the population, so there is a need to maintain a wide range of sources.

- Knowledge is likely to be associated with reported food safety behaviour but there is little evidence of an association between attitudes and behaviour. Those who know 'why' a particular behaviour is recommended are also more likely to report undertaking that behaviour. Campaign materials therefore could focus on improving both knowledge of recommended practice and the rationale underpinning recommended practice.

- The value of a good food hygiene rating is not reflected in reported use of food hygiene rating schemes and this is the pattern across gender, age and country of residence, except in Northern Ireland where a similar proportion reported using a scheme and valuing a good score. There is scope for the FSA to learn from the implementation and accessibility of the scheme in Northern Ireland.

- Reported use of a food hygiene rating scheme is not related to how safe people perceive eating out to be compared to eating at home.

- People who report using a food hygiene rating scheme have higher IRP scores on average than those who do not report using a food hygiene rating scheme.

These findings could be used to identify population groups who could be targeted with specific messages about food safety.

Having a composite measure of domestic food safety (the IRP) simplifies the process of looking at predictors of following recommended practice while controlling for social and economic factors.

Future waves will also allow further investigation into trends in IRP score over time and, where possible, tentatively relate them to campaigns or interventions or the impact of a major food scare. Throughout this report, possible further analysis or implications for data collection have been identified. In some cases, new questions have already been introduced for Wave 3 of the survey, for example where people learn about food safety and whether other household members have a food allergy. Suggestions for additional detail to be collected in future waves are:

- Further questions on finances, such as debt
- Questions that explore the extent to which the presence of young children impact on food safety practices in terms of access to information and whether participants retain this information as their children grow older
- Questions that explore how people access food safety information on the internet e.g. whether they intentionally seek it or they come across it when looking elsewhere
- Questions that quantify psychological factors such as perception of risk
- More sensitive and detailed questions on frequency of eating out
- Asking directly about valuing good food hygiene ratings to make future assessments of use of schemes and value more comparable

In terms of our sub-groups least likely to report behaviours in line with recommended practice, combining future waves to provide greater numbers will allow further exploration of their reported behaviours. Ethnicity is a predictor of IRP score but numbers in the current dataset are too small to look at differences between ethnic groups. Another option is to include an ethnic boost in a future wave of Food and You, which would increase the number of respondents from different ethnicities, and increase the potential for further sub-group analysis to explore the differences between these groups. A larger sample size, or targeted sample boost, may also allow more exploration of the associations seen between working status and reported behaviours, having a food allergy and valuing a good food hygiene rating, and concerns about food price and specific food safety practices.

Qualitative research may be needed to better understand the influence of having young children in the household on behaving in line with recommended practice. While the survey data indicated presence of children in the household to be an important factor in food hygiene behaviour, understanding the dynamics behind this association would be better explored using qualitative research approaches.

Finally, to be able to untangle cause and effect when looking at any associations we need longitudinal data. While there are longitudinal studies that collect data on

aspects of food safety,[21] none are as comprehensive as Food and You. If the IRP could be included as a module on several waves of a longitudinal study this would yield powerful information to help unpack the causal pathways conducive to people following recommended food safety practices.

[21] Hall J, d'Ardenne J, Barnes M, Roberts C, McManus S (2011) *Longitudinal data on food related issues: A scoping review.* NatCen: London

Appendix A. Index of Recommended Practice

How the IRP score is calculated

The IRP comprises ten items. Each item is derived either from individual questions or from pairs of questions or (in one case) a group of four questions (see Table A2). It is a binary index and item responses are scored as either recommended practice (RP) = 1 or non-recommended practice (NRP) = 0. 'Not applicable' responses are scored as missing and the question is excluded from the calculation of the IRP score for that individual.

An overall IRP score was calculated for all participants in the Wave 1 and Wave 2 combined Food and You dataset, except those who were missing more than half (five) of the ten items. Each participant could score overall between 0 and 100 on the index. Table A1 shows the frequency and distribution of scores. The mean score was 70.0 (SD 15.0).

Table A1 Categorised IRP score

IRP Score (out of 100)	Number	Percent	Cumulative percent
0-10	14	0.2	0.2
11-20	28	0.4	0.7
21-30	121	1.9	2.6
31-40	344	5.4	7.9
41-50	837	13.1	21.1
51-60	1252	19.6	40.7
61-70	1803	28.3	69.0
71-80	1397	21.9	90.9
81-90	520	8.2	99.0
91-100	62	1.0	100
Weighted base	*6378*	100	
Unweighted base	*6379*		

Note: All 62 participants in the category 91-100 scored 100

.

Table A2 Derivation of the Index of Recommended Practice					
Item	**Question**	**RP response (1)**	**Non-RP response (0)**	**N/A**	**Final item scoring for combined items**
Chilling	Q4.9 Do you ever check your fridge temperature?	-Yes - Someone else in the household does - I don't need to – it has an alarm	- No - Don't know	- N/A	1 = RP responses to all questions 0 = Non-RP responses to 1 or more questions NA = NA to Q4.9
	Q4.10 How often do you or another person in your household check the temperature of the fridge?	- Daily - 2-3 times a week - Once a week - Less than once a week but more than once a month - Once a month - I don't need to – it has an alarm *If respondent said 'I don't need to – it has an alarm' in Q4.9, then coded RP in Q4.10*	- Four times a year - 1-2 times a year - Never - Don't know/ Can't remember	- If respondents said 'No' in Q4.9 -N/A	
	Q4.11 Thinking about fridge temperature, can you tell me how you normally check the temperature? *(multicode)*	AT LEAST ONE OF: - Check the temperature display /thermometer built into fridge' - Put a thermometer into the fridge and check *If respondent said 'I don't need to – it has an alarm' in Q4.9 and/or Q4.10, then coded RP in Q4.11*	ZERO RP RESPONSES AND AT LEAST ONE OF: - Check setting/gauge of fridge - Look inside/check for ice/condensation - Feel food inside to see if it is cold - Family/friend checks it for me - I do not check it - Other answer	- If respondents said 'No' in Q4.9 - N/A	

			- Don't know		
	Q4.12 What do you think the temperature inside your fridge should be?	- 0-5°C	- Less than 0°C - More than 5°C but less than 8°C - 8-10°C - More than 10°C - Go by setting on the fridge - Other answer - Don't know		
Cooking food to steaming hot	Q4.1.13 Do you do the following things at all when you are in the kitchen and if so how frequently; - Cook food to steaming hot	- Always	- Most of the time - Sometimes - Never - Don't know	- N/A	-
Eating chicken/turkey if meat is pink or has pink/red juices	Q4.1.14 Do you do the following things at all when you are in the kitchen and if so how frequently; - Eat chicken or turkey if the meat is pink or has pink or red juices	- Never	- Sometimes - Most of the time - Always - Don't know	- N/A	-

Number of times you would consider re-heating food	Q4.25 How many times would you consider re-heating food after it was cooked for the first time?	- Not at all - Once	- Twice - Three times - More than three times - Don't know	- N/A	-
How you usually tell food has been re-heated properly	Q4.26 And how do you usually tell that food has been re-heated properly? *(multicode)*	AT LEAST ONE OF: - Steam is coming out of it - Check the middle is hot - Use a thermometer/probe - When it is bubbling - When it is piping hot - Test with a knife/fork/spoon	ZERO RP RESPONSES AND AT LEAST ONE OF: - Taste it - Stir it - Check it is an even temperature throughout - Put hand over it/touch it - Use a timer - It looks hot - Experience/you just know - The smell of it - Check texture - Other answer - I don't check - Don't know	- N/A	-
Washing raw meat/poultry	Q4.1.5 Do you do the following things at all when you are in the kitchen and if so how frequently; - Wash raw meat and poultry	- Never	- Sometimes - Most of the time - Always - Don't know	- N/A	-

Where/how you store raw meat and poultry in the fridge	Q4.14 Where in the fridge do you store raw meat and poultry? *(multicode)*	AT LEAST ONE OF: - Bottom shelf - Separate compartment - Separate from any other foods - Separate/other fridge - Away from cooked meats	ZERO RP RESPONSES AND AT LEAST ONE OF: - Anywhere - At the top of the fridge - In the middle of the fridge - Wherever there is space - Put in a container in the fridge - Other Answer - Don't know	- Don't store raw meat/poultry in fridge - Don't buy/store meat/poultry at all - Kept in the freezer (ONLY) - N/A	1 = RP responses to both questions 0 = Non-RP response to one or both questions AND no NA responses NA = NA response to one or both questions
	Q4.15 How do you store raw meat and poultry in the fridge? *(multicode)*	AT LEAST ONE OF: - Away from cooked foods - Covered in film/foil - In a covered container - In a drawer/special compartment/allocated shelf in fridge - In plastic bags (any mention) - On a covered plate/bowl/dish	ZERO RP RESPONSES AND AT LEAST ONE OF: - In its packaging - On a plate - Covered with a plate/dish - Leave uncovered (any mention) - Other answer - Don't know	- Don't store raw meat/poultry in fridge - Keep in freezer (ONLY) - N/A	
Washing hands before food preparation/after handling raw meat/fish	Q4.1.11 Do you do the following things at all when you are in the kitchen and if so how frequently; - Wash hands before I start preparing or cooking food	- Always	- Most of the time - Sometimes - Never - Don't know	- N/A	1 = RP responses to both questions 0 = Non-RP response to one or both questions NA = NA

	Q4.1.12 Do you do the following things at all when you are in the kitchen and if so how frequently; - Wash hands after handling raw meat/fish	- Always	- Most of the time - Sometimes - Never - Don't know	- N/A	response to both questions
Knowledge and checking of use by dates	Q4.19 Which of these indicates whether food is safe to eat? *(multicode)*	AT LEAST ONE OF: - Use by - It depends	ZERO RP RESPONSES AND AT LEAST ONE OF: - Best before date - Sell by date - Display until date - None of these - Don't know - All of these	- N/A	1 = RP responses to both questions 0 = Non-RP response to one or both questions AND no NA responses NA = NA response to one or both questions
	Q22 Do you check use by dates when you are about to cook or prepare food?	- Always - Depending on food type	- Sometimes - Never - Don't know	- N/A	
Last day you would consider eating Sunday leftovers	Q4.24 If you made a meal on Sunday, what is the last day that you would consider eating the leftovers?	- The same day - Monday - Tuesday - Never have leftovers	- Wednesday - Thursday - Friday - Saturday - Sunday - More than a week - Don't know	- N/A	-

Appendix B. Relationship between practices and social and economic variables

In all the regression tables below we have shown the final model including all social and economic factors in Table B5. We have highlighted that the factor in the model is significant (has a p value of less than 0.05) using an asterix. A statistically significant factor means the outcome of the model varies according to that factor. If the factor is significant we can then look at the p-values for each of the categories within each factor, if the p-value for a category is less than 0.05 then the category is significantly different from the reference category.

B.1 IRP score by age, gender and country

Table B1 Multiple linear regression: overall IRP score

Base: 2010 and 2012			**95% CI**		
Factor	**Category**	**Coeff**	**Lower**	**Upper**	**p**
Gender*					
	Male (Ref.)	0.0			
	Female	5.4	3.4	7.4	<0.001
Country*					
	England (Ref.)	0			
	Wales	2.7	0.6	4.7	0.010
	Scotland	0.7	-0.5	1.9	0.269
	NI	2.3	1.1	3.4	<0.001
Age					
	16-34 (Ref.)	0.0			
	35-64	1.9	0	3.9	0.054
	65+	0.4	-1.8	2.5	0.728
Gender x Age*					
	Female x 16-34 (Ref.)	0.0			
	Female x 35-64	-0.9	-3.3	1.5	0.454
	Female x 65+	-3.0	-5.6	-0.4	0.024
Intercept		62.1			
Unweighted base					*6375*
Weighted base					*6374*

* Factor is significant at the 5% level.

Table B2 Predicted IRP score by age, gender and country			
Age group	**Gender**	**Country**	**Predicted IRP score (out of 100)**
35 - 64	Female	Wales	71.2
35 - 64	Female	NI	70.8
16 -34	Female	Wales	70.2
16 -34	Female	NI	69.8
35 - 64	Female	Scotland	69.2
35 - 64	Female	England	68.5
16 -34	Female	Scotland	68.2
65 +	Female	Wales	67.6
16 -34	Female	England	67.5
65 +	Female	NI	67.1
35 - 64	Male	Wales	66.7
35 - 64	Male	NI	66.3
65 +	Female	Scotland	65.5
65 +	Male	Wales	65.2
65 +	Female	England	64.9
16 -34	Male	Wales	64.8
65 +	Male	NI	64.8
35 - 64	Male	Scotland	64.7
16 -34	Male	NI	64.4
35 - 64	Male	England	64.0
65 +	Male	Scotland	63.2
16 -34	Male	Scotland	62.8
65 +	Male	England	62.5
16 -34	Male	England	62.1

B.2 Predictors of IRP score

Table B3 Multiple linear regression: overall IRP score and social and economic factors					
Base: 2010 and 2012			**95% CI**		
Factor	**Category**	**Coeff**	**Lower**	**Upper**	**P**
Age & Gender*					
	Male 16-34 (Ref.)	0.0			
	Male 35-64	0.5	-1.5	2.5	0.640
	Male 65+	-1.1	-3.9	1.6	0.418
	Female 16-34	5.2	3.2	7.3	<0.001
	Female 35-64	5.0	3.0	6.9	<0.001
	Female 65+	1.5	-1.2	4.1	0.272
Region*					
	London (Ref.)	0.0			
	North East	0.4	-2.4	3.3	0.755
	North West	2.8	0.5	5.0	0.015
	Yorkshire and The Humber	2.2	-0.2	4.5	0.074
	East Midlands	2.5	0.1	4.9	0.043
	West Midlands	2.0	-0.3	4.2	0.094
	East of England	-0.3	-2.7	2.0	0.784
	South East	-0.8	-3.1	1.5	0.487
	South West	-2.4	-4.9	0.1	0.062
	Wales	2.4	-0.3	5.0	0.085
	Scotland	1.1	-0.9	3.2	0.282
	Northern Ireland	2.7	0.5	4.9	0.015
Highest education level achieved					
	Degree of higher (Ref.)	0.0			
	A Level/Diploma/Apprentice	1.0	-0.4	2.5	0.161
	GCSE	1.5	0.0	3.1	0.054
	Other/None	0.9	-0.7	2.6	0.272
Housing tenure					
	Owner occupied (Ref.)	0.0			
	Other	0.0	-1.2	1.2	0.953
Household size					
	1 (Ref.)	0.0			
	2	0.8	-0.6	2.3	0.270
	3+	0.9	-1.0	2.8	0.373
Presence of children in household					
	Yes (Ref.)	0.0			
	No	-1.0	-2.5	0.5	0.197
Income level					

	Up to £10,399 (Ref.)	0.0			
	£10,400 to £25,999	-1.2	-2.7	0.3	0.131
	£26,000 to £51,999	-1.4	-3.1	0.4	0.138
	£52,000+	-0.4	-2.4	1.6	0.684
	Missing	-2.3	-4.0	-0.5	0.012
Socio-economic classification					
	Managerial/Professional (Ref.)	0.0			
	Intermediate	-0.3	-1.7	1.2	0.712
	Routine/Manual	1.1	-0.2	2.4	0.097
	Not classifiable/Never worked	-0.2	-2.0	1.7	0.860
Marital status*					
	Married/Living as married (Ref.)	0.0			
	Single/Widowed/Divorced	-1.9	-3.1	-0.6	0.004
Ethnicity*					
	White (Ref.)	0.0			
	BME/Other	-5.5	-7.7	-3.3	<0.001
Work status					
	In work (Ref.)	0.0			
	Retired	-0.1	-1.9	1.7	0.941
	Unemployed	-2.2	-4.4	0.0	0.047
	Other	-1.8	-3.3	-0.2	0.029
Religion					
	Christian (Ref.)	0.0			
	Non-Christian	0.5	-2.3	3.3	0.716
	No religion	-0.4	-1.6	0.8	0.526
Self-reported general health					
	Good/Very good (Ref.)	0.0			
	Fair	-0.4	-1.6	0.8	0.517
	Bad/Very bad	-2.0	-4.2	0.1	0.068
Disability/Long-lasting illness					
	Yes (Ref.)	0.0			
	No	0.6	-0.7	1.8	0.352
Urbanity					
	Urban (Ref.)	0.0			
	Rural	-0.7	-2.2	0.7	0.328
Index of Multiple Deprivation					
	1 (most deprived) (Ref.)	0.0			
	2	0.8	-0.7	2.3	0.289
	3	1.4	-0.2	2.9	0.080
	4	0.2	-1.3	1.7	0.802
	5 (least deprived)	-0.8	-2.4	0.7	0.294
Intercept		64.0			

Unweighted base	*6083*
Weighted base	*6006*

* Factor is significant at the 5% level.

Table B4 Multiple linear regression: overall IRP score and household composition

Base: 2010 and 2012			**95% CI**		
Factor	**Category**	**Coeff**	**Lower**	**Upper**	**p**
Household composition*					
	Adult household, all aged 26+ and at least one aged 75+ (Ref.)	0.0			
	Adult household, all aged 26+ and at least one aged 65 – 74	1.9	0.4	3.5	0.016
	Adult household, all aged 26 – 64	2.6	0.7	4.5	0.008
	Adult household with at least one young adult aged 16 -25	3.7	1.4	6.0	0.002
	Small family, all children over age 5	4.5	2.2	6.9	<0.001
	Large family, all children over age 5	2.9	-0.1	6.0	0.059
	Small family, at least one child under age 5	5.1	2.6	7.5	<0.001
	Large family, at least one child under age 5	6.1	3.0	9.2	<0.001
Unweighted base					*5847*
Weighted base					*5567*

* Factor is significant at the 5% level.

Model also includes the following variables: gender, region, highest education level achieved, housing tenure, income level, socio-economic classification, marital status, ethnicity, work status, religion, self-reported general health, disability/long-lasting illness, urbanity, index of multiple deprivation.

Table B5 Multiple linear regression: overall IRP score and households with children under 5

Base: 2010 and 2012			**95% CI**		
Factor	**Category**	**Coeff**	**Lower**	**Upper**	**p**
Household composition*					
	Households with no children under age 5 (Ref.)	0.0			
	Households with children under age 5	2.2	0.7	3.6	0.003
Unweighted base					*5847*
Weighted base					*5567*

* Factor is significant at the 5% level.

Model also includes the following variables: gender, region, highest education level achieved, housing tenure, income level, socio-economic classification, marital status, ethnicity, work status, religion, self-reported general health, disability/long-lasting illness, urbanity, index of multiple deprivation.

Table B6 Multiple linear regression: overall IRP score and country					
Base: 2010 and 2012			**95% CI**		
Factor	**Category**	**Coeff**	**Lower**	**Upper**	**P**
UK Country*					
	England (Ref.)	0.0			
	Wales	1.7	-0.4	3.8	0.104
	Scotland	0.5	-0.7	1.7	0.404
	Northern Ireland	2.1	0.8	3.4	0.002
Unweighted base					*6083*
Weighted base					*6006*

* Factor is significant at the 5% level.

Model also includes the social and economic factors.

Table B7 Multiple linear regression: overall IRP score and region in England					
Base: 2010 and 2012 and living in England			**95% CI**		
Factor	**Category**	**Coeff**	**Lower**	**Upper**	**P**
English regions*					
	London (Ref.)	0.0			
	North East	0.5	-2.4	3.3	0.753
	North West	2.8	0.5	5.0	0.016
	Yorkshire and The Humber	2.1	-0.3	4.5	0.082
	East Midlands	2.6	0.2	5.0	0.035
	West Midlands	2.0	-0.3	4.3	0.095
	East of England	-0.2	-2.6	2.1	0.856
	South East	-0.7	-3.0	1.6	0.536
	South West	-2.3	-4.8	0.2	0.073
Unweighted base					*3911*
Weighted base					*5021*

* Factor is significant at the 5% level.

Model also includes the social and economic factors.

Appendix C. Where do people get their food safety information tables

Table C1 Whether currently accesses information on food safety					
Base: 2012	**Age**			**Gender**	
	16-34	**35-64**	**65+**	**Male**	**Female**
	%	%	%	%	%
No	15	20	34	23	19
Yes	85	80	66	77	81
Unweighted base	*786*	*1644*	*799*	*1315*	*1916*
Weighted base	*1006*	*1574*	*648*	*1579*	*1653*

Table C2 Where people get information about how to prepare & cook food safely*		
Base: All respondents 2012, who currently access at least one source of information	**Currently***	**In the future***
	%	%
Retailers & Food producers	50	26
TV & radio	46	23
Friends & Family	45	22
Books, newspapers & magazines	44	34
Internet	31	66
School or Employer	21	5
Other	5	7
Unweighted base	*2483*	*2483*
Weighted base	*2551*	*2551*

* Participants could give more than one source

Table C3 Proportion of respondents anticipating using the internet to look for information by gender		
Base: All respondents 2012, who currently access at least one source of information	**Males**	**Females**
	%	%
Current	32	29
In the future	65	66
Unweighted base	*982*	*1501*
Weighted base	*1219*	*1333*

Table C4 Proportion of respondents anticipating using the internet to look for information by age group by country				
Base: All respondents 2012, who currently access at least one source of information	England	Wales	Scotland	NI
	%	%	%	%
Current	31	28	30	30
In the future	67	58	55	66
Unweighted base	*1627*	*85*	*384*	*387*
Weighted base	*2137*	*132*	*211*	*72*

Table C5 Future sources for those who do not currently get information about how to prepare & cook food safely*	
Base: All respondents 2012, who do not currently access any sources of information	**%**
Internet	43
Other	30
Books, newspapers & magazines	15
Retailers & Food producers	12
Friends & Family	12
TV & radio	9
None	3
School or Employer	2
Unweighted base	*748*
Weighted base	*680*

* Participants could give more than one source

Appendix D. Behaviours, knowledge and attitudes towards food safety practices

In all the regression tables below we have shown the final model including all social and economic factors in Table B5. We have highlighted that the factor in the model is significant (has a p value of less than 0.05) using an asterix. A statistically significant factor means the outcome of the model varies according to that factor. If the factor is significant we can then look at the p-values for each of the categories within each factor, if the p-value for a category is less than 0.05 then the category is significantly different from the reference category.

An odds ratio (OR) of greater than 1 indicates higher odds of that outcome compared to the reference category outcome.

D.1 Food safety knowledge

Table D1 Multiple logistic regression: knowledge predictors of food safety behaviours (chopping boards)

Base: 2012

Outcome: Does not use different chopping boards for different foods

Factor	Category	OR	95% CI		P
			Lower	Upper	
Know the reason for washing chopping boards*	Yes (Ref.)	1			
	No	2.251	1.415	3.582	0.001
Unweighted base					*2814*
Weighted base					*2743*

* Factor is significant at the 5% level.

Model also includes the social and economic factors.

Table D2 Multiple logistic regression: knowledge predictors of food safety behaviours (fridge temperature)

Base: 2010 and 2012

Outcome: Does not check the fridge temperature

Factor	Category	OR	95% CI		P
			Lower	Upper	
Know the correct fridge temperature*	Yes (Ref.)	1			
	No	1.812	1.583	2.075	<0.001
Unweighted base					*6069*
Weighted base					*5966*

* Factor is significant at the 5% level.

Model also includes the social and economic factors.

Table D3 Multiple logistic regression: knowledge predictors of food safety behaviours

Base: 2010 and 2012

Outcome: Does not check use by dates

Factor	Category	OR	95% CI		P
			Lower	Upper	
Know what indicates if food is safe to eat*	Yes (Ref.)	1			
	No	1.761	1.478	2.100	<0.001
Unweighted base					*6093*
Weighted base					*6017*

* Factor is significant at the 5% level.

Model also includes the social and economic factors.

D.2 Attitudes towards food safety

Table D4 Multiple logistic regression: predictors of following recommended practice (cooking)

Base: 2010 and 2012

Outcome: Does not eat chicken or turkey if the meat is pink

Factor	Category	OR	95% CI		P
			Lower	Upper	
I am unlikely to get food poisoning from food prepared in my own home*	Definitely agree (Ref.)	1			
	Tend to agree	0.555	0.378	0.816	0.003
	Neither agree nor disagree	0.624	0.347	1.122	0.115
	Tend to disagree	0.939	0.547	1.614	0.821
	Definitely disagree	0.528	0.271	1.029	0.061
Unweighted base					*5829*
Weighted base					*5735*
I often worry about whether the food I have is safe to eat	Definitely agree (Ref.)	1			
	Tend to agree	1.150	0.563	2.351	0.701
	Neither agree nor disagree	1.046	0.471	2.323	0.913
	Tend to disagree	1.224	0.620	2.418	0.560
	Definitely disagree	1.072	0.532	2.161	0.845
Unweighted base					*5833*
Weighted base					*5738*
People worry too much about getting food poisoning**	Definitely agree (Ref.)	1			
	Tend to agree	1.589	0.994	2.540	0.053
	Neither agree nor disagree	1.459	0.863	2.465	0.158
	Tend to disagree	1.668	0.998	2.790	0.051
	Definitely disagree	2.698	1.353	5.380	0.005
Unweighted base					*5787*
Weighted base					*5694*

* Factor is significant at the 5% level.

**p=0.06

Model also includes the social and economic factors.

Table D5 Multiple logistic regression: predictors of following recommended practice (chilling)					
Base: 2010 and 2012					
Outcome: Checks their fridge temperature					
Factor	**Category**	**OR**	**95% CI**		**P**
			Lower	**Upper**	
I am unlikely to get food poisoning from food prepared in my own home*	Definitely agree (Ref.)	1			
	Tend to agree	0.812	0.697	0.946	0.007
	Neither agree nor disagree	0.789	0.612	1.018	0.068
	Tend to disagree	0.738	0.598	0.910	0.005
	Definitely disagree	0.994	0.721	1.370	0.970
Unweighted base					*6061*
Weighted base					*5991*
I often worry about whether the food I have is safe to eat	Definitely agree (Ref.)	1			
	Tend to agree	0.845	0.612	1.166	0.305
	Neither agree nor disagree	0.784	0.554	1.112	0.172
	Tend to disagree	0.713	0.525	0.970	0.031
	Definitely disagree	0.702	0.514	0.959	0.026
Unweighted base					6065
Weighted base					5994
People worry too much about getting food poisoning	Definitely agree (Ref.)	1			
	Tend to agree	0.965	0.758	1.230	0.773
	Neither agree nor disagree	0.920	0.714	1.187	0.525
	Tend to disagree	0.941	0.736	1.202	0.626
	Definitely disagree	1.052	0.770	1.401	0.729
Unweighted base					6014
Weighted base					5948

* Factor is significant at the 5% level.

Model also includes the social and economic factors.

Table D6 Multiple logistic regression: predictors of following recommended practice (keeping opened cooked/cured meat)					
Base: 2012					
Outcome: Follow RP for length of time they keep a packet of sliced cooked or cured meat in the fridge once opened					
Factor	**Category**	**OR**	**95% CI**		**P**
			Lower	**Upper**	
I am unlikely to get food poisoning from food prepared in my own home	Definitely agree (Ref.)	1			
	Tend to agree	1.028	0.804	1.315	0.823
	Neither agree nor disagree	1.140	0.753	1.724	0.536
	Tend to disagree	0.956	0.680	1.343	0.795
	Definitely disagree	0.878	0.543	1.420	0.597
Unweighted base					*2735*
Weighted base					*2669*
I often worry about whether the food I have is safe to eat*	Definitely agree (Ref.)	1			
	Tend to agree	2.290	1.389	3.776	0.001
	Neither agree nor disagree	1.057	0.605	1.846	0.845
	Tend to disagree	1.288	0.792	2.094	0.307
	Definitely disagree	1.348	0.821	2.213	0.237
Unweighted base					*2737*
Weighted base					*2669*
People worry too much about getting food poisoning	Definitely agree (Ref.)	1			
	Tend to agree	1.146	0.760	1.729	0.514
	Neither agree nor disagree	1.050	0.677	1.631	0.826
	Tend to disagree	1.339	0.877	2.044	0.176
	Definitely disagree	1.663	1.026	2.695	0.039
Unweighted base					*2708*
Weighted base					*2647*

* Factor is significant at the 5% level.

Model also includes the social and economic factors.

Table D7 Multiple logistic regression: predictors of following recommended practice (keeping opened pâté)

Base: 2012

Outcome: Follow RP for length of time they keep a packet of meat, fish or seafood pâté in the fridge once opened

Factor	Category	OR	95% CI		P
			Lower	Upper	
I am unlikely to get food poisoning from food prepared in my own home	Definitely agree (Ref.)	1			
	Tend to agree	0.918	0.721	1.170	0.490
	Neither agree nor disagree	0.902	0.602	1.352	0.618
	Tend to disagree	1.212	0.869	1.691	0.257
	Definitely disagree	0.790	0.478	1.306	0.358
Unweighted base					*2343*
Weighted base					*2380*
I often worry about whether the food I have is safe to eat*	Definitely agree (Ref.)	1			
	Tend to agree	1.137	0.649	1.994	0.653
	Neither agree nor disagree	1.125	0.622	2.032	0.697
	Tend to disagree	0.800	0.467	1.371	0.417
	Definitely disagree	0.718	0.416	1.239	0.234
Unweighted base					*2343*
Weighted base					*2380*
People worry too much about getting food poisoning*	Definitely agree (Ref.)	1			
	Tend to agree	1.505	0.990	2.287	0.056
	Neither agree nor disagree	1.471	0.947	2.286	0.086
	Tend to disagree	1.638	1.069	2.510	0.023
	Definitely disagree	2.629	1.589	4.348	< 0.001
Unweighted base					*2323*
Weighted base					*2361*

* Factor is significant at the 5% level.

Model also includes the social and economic factors.

Table D8 Multiple logistic regression: predictors of following recommended practice (keeping opened dip)					
Base: 2012					
Outcome: Follow RP for length of time they keep a dip in the fridge once opened					
Factor	**Category**	**OR**	**95% CI**		**P**
			Lower	**Upper**	
I am unlikely to get food poisoning from food prepared in my own home	Definitely agree (Ref.)	1			
	Tend to agree	0.925	0.717	1.192	0.546
	Neither agree nor disagree	0.768	0.522	1.129	0.179
	Tend to disagree	1.034	0.746	1.434	0.840
	Definitely disagree	1.023	0.604	1.736	0.931
Unweighted base					*2269*
Weighted base					*2382*
I often worry about whether the food I have is safe to eat*	Definitely agree (Ref.)	1			
	Tend to agree	1.320	0.779	2.236	0.302
	Neither agree nor disagree	1.298	0.745	2.261	0.357
	Tend to disagree	0.866	0.524	1.430	0.574
	Definitely disagree	0.811	0.484	1.358	0.426
Unweighted base					*2269*
Weighted base					*2382*
People worry too much about getting food poisoning	Definitely agree (Ref.)	1			
	Tend to agree	1.075	0.698	1.656	0.743
	Neither agree nor disagree	1.031	0.652	1.631	0.896
	Tend to disagree	1.181	0.762	1.830	0.458
	Definitely disagree	1.656	0.990	2.769	0.055
Unweighted base					*2249*
Weighted base					*2364*

* Factor is significant at the 5% level.

Model also includes the social and economic factors.

Table D9 Multiple logistic regression: predictors of following recommended practice (keeping opened smoked fish)					
Base: 2012					
Outcome: Follow RP for length of time they keep a packet of smoked fish in the fridge once opened					
Factor	**Category**	**OR**	**95% CI**		**P**
			Lower	**Upper**	
I am unlikely to get food poisoning from food prepared in my own home	Definitely agree (Ref.)	1			
	Tend to agree	1.014	0.777	1.323	0.921
	Neither agree nor disagree	0.874	0.571	1.337	0.534
	Tend to disagree	0.866	0.608	1.234	0.427
	Definitely disagree	1.091	0.579	2.057	0.787
Unweighted base					*2084*
Weighted base					*2140*
I often worry about whether the food I have is safe to eat	Definitely agree (Ref.)	1			
	Tend to agree	1.317	0.707	2.456	0.386
	Neither agree nor disagree	0.896	0.469	1.712	0.740
	Tend to disagree	0.907	0.501	1.645	0.749
	Definitely disagree	0.784	0.430	1.432	0.429
Unweighted base					*2084*
Weighted base					*2141*
People worry too much about getting food poisoning	Definitely agree (Ref.)	1			
	Tend to agree	0.956	0.608	1.505	0.847
	Neither agree nor disagree	1.143	0.713	1.833	0.578
	Tend to disagree	0.959	0.606	1.519	0.860
	Definitely disagree	1.369	0.788	2.377	0.265
Unweighted base					*2064*
Weighted base					*2122*

Model also includes the social and economic factors.

Table D10 Multiple logistic regression: predictors of following recommended practice (keeping opened soft cheese)

Base: 2012

Outcome: Follow RP for length of time they keep a packet of soft cream cheese in the fridge once opened

Factor	Category	OR	95% CI		P
			Lower	Upper	
I am unlikely to get food poisoning from food prepared in my own home	Definitely agree (Ref.)	1			
	Tend to agree	1.249	0.951	1.639	0.109
	Neither agree nor disagree	1.043	0.662	1.645	0.856
	Tend to disagree	1.252	0.871	1.798	0.224
	Definitely disagree	0.620	0.332	1.158	0.134
Unweighted base					*2390*
Weighted base					*2460*
I often worry about whether the food I have is safe to eat*	Definitely agree (Ref.)	1			
	Tend to agree	0.948	0.538	1.670	0.853
	Neither agree nor disagree	1.213	0.662	2.220	0.532
	Tend to disagree	0.717	0.416	1.236	0.232
	Definitely disagree	0.701	0.402	1.224	0.211
Unweighted base					*2391*
Weighted base					*2460*
People worry too much about getting food poisoning	Definitely agree (Ref.)	1			
	Tend to agree	1.011	0.656	1.559	0.960
	Neither agree nor disagree	0.780	0.491	1.240	0.294
	Tend to disagree	0.916	0.587	1.429	0.700
	Definitely disagree	1.106	0.659	1.859	0.702
Unweighted base					*2368*
Weighted base					*2440*

* Factor is significant at the 5% level.

Model also includes the social and economic factors.

Table D11 Multiple logistic regression: predictors of washing fruit before eating

Base: 2012

Outcome: Wash fruit before eating raw

Factor	Category	OR	95% CI		P
			Lower	Upper	
A little bit of dirt won't harm you*	Definitely agree (Ref.)	1			
	Tend to agree	1.148	0.876	1.504	0.318
	Neither agree nor disagree	1.446	0.994	2.103	0.054
	Tend to disagree	1.965	1.398	2.761	<0.001
	Definitely disagree	2.467	1.696	3.587	<0.001
Unweighted base					*2860*
Weighted base					*2084*

* Factor is significant at the 5% level.

Model also includes the social and economic factors.

Table D12 Multiple logistic regression: predictors of washing fruit before cooking

Base: 2012

Outcome: Wash fruit before cooking

Factor	Category	OR	95% CI		P
			Lower	Upper	
A little bit of dirt won't harm you*	Definitely agree (Ref.)	1			
	Tend to agree	1.379	1.027	1.852	0.033
	Neither agree nor disagree	2.091	1.376	3.178	0.001
	Tend to disagree	2.745	1.900	3.966	<0.001
	Definitely disagree	3.478	2.297	5.265	<0.001
Unweighted base					*2393*
Weighted base					*2319*

* Factor is significant at the 5% level.

Model also includes the social and economic factors.

Table D13 Multiple logistic regression: predictors of washing vegetables before eating

Base: 2012

Outcome: Wash vegetables before eating raw

Factor	Category	OR	95% CI		P
			Lower	Upper	
A little bit of dirt won't harm you*	Definitely agree (Ref.)	1			
	Tend to agree	1.202	0.888	1.627	0.233
	Neither agree nor disagree	1.245	0.807	1.922	0.322
	Tend to disagree	1.639	1.104	2.432	0.014
	Definitely disagree	2.695	1.727	4.206	<0.001
Unweighted base					*2797*
Weighted base					*2726*

* Factor is significant at the 5% level.

Model also includes the social and economic factors.

Table D14 Multiple logistic regression: predictors of washing vegetables before cooking

Base: 2012

Outcome: Wash vegetables before cooking

Factor	Category	OR	95% CI		P
			Lower	Upper	
A little bit of dirt won't harm you*	Definitely agree (Ref.)	1			
	Tend to agree	1.634	1.236	2.160	0.001
	Neither agree nor disagree	2.406	1.616	3.582	<0.001
	Tend to disagree	1.821	1.288	2.574	0.001
	Definitely disagree	4.439	2.966	6.642	<0.001
Unweighted base					*2938*
Weighted base					*2760*

* Factor is significant at the 5% level.

Model also includes the social and economic factors.

D.3 Attitudes towards food price

Table D15 Multiple logistic regression: predictors of following recommended practice (use-by dates)

Base: 2010 and (Scotland and NI only) 2012

Outcome: Check use by dates when preparing to cook food

Factor	Category	OR	95% CI		P
			Lower	Upper	
The price of food means I often don't buy the food I would like to	Definitely agree (Ref.)	1			
	Tend to agree	1.183	0.796	1.758	0.406
	Neither agree nor disagree	1.020	0.633	1.642	0.935
	Tend to disagree	1.068	0.728	1.566	0.738
	Definitely disagree	1.207	0.808	1.804	0.358
Unweighted base					*4056*
Weighted base					*3419*

Model also includes the social and economic factors.

D.4 Attitudes towards novel food technologies

Table D16 Multiple linear regression: overall IRP score and knowledge of novel food technologies

Base: 2012

Factor	Category	Coeff	95% CI		P
			Lower	Upper	
I feel knowledgeable about the use of animal cloning	Definitely agree (Ref.)	0.0			
	Tend to agree	-0.2	-5.2	4.8	0.937
	Neither agree nor disagree	3.2	-2.0	8.3	0.227
	Tend to disagree	0.9	-3.9	5.7	0.711
	Definitely disagree	2.3	-2.6	7.3	0.353
Unweighted base					*1872*
Weighted base					*1875*
I feel knowledgeable about the use of genetic modification*	Definitely agree (Ref.)	0.0			
	Tend to agree	0.7	-3.6	4.9	0.760
	Neither agree nor disagree	3.9	-0.4	8.2	0.073
	Tend to disagree	1.4	-2.7	5.5	0.504

	Definitely disagree	2.7	-1.6	7.0	0.222
Unweighted base					*2322*
Weighted base					*2353*
I feel knowledgeable about the use of irradiation	Definitely agree (Ref.)	0.0			
	Tend to agree	0.1	-6.6	6.7	0.987
	Neither agree nor disagree	0.0	-7.0	6.9	0.992
	Tend to disagree	0.4	-6.0	6.8	0.901
	Definitely disagree	-0.2	-6.7	6.4	0.956
Unweighted base					*986*
Weighted base					*1009*
I feel knowledgeable about the use of nanotechnology	Definitely agree (Ref.)	0.0			
	Tend to agree	-0.3	-10.2	9.7	0.958
	Neither agree nor disagree	1.3	-8.5	11.1	0.795
	Tend to disagree	-4.0	-13.1	5.1	0.392
	Definitely disagree	1.6	-7.5	10.7	0.733
Unweighted base					*538*
Weighted base					*585*

* Factor is significant at the 5% level.

Model also includes the social and economic factors.

D.5 Allergies and food safety

Table D17 Multiple linear regression: overall IRP score and allergic to certain foods

Base: 2010 and 2012

Factor	Category	Coeff	95% CI		P
			Lower	Upper	
Allergy	No (Ref.)	0.0			
	Yes	-0.3	-2.2	1.5	0.742
Unweighted base					*6062*
Weighted base					*5978*

Model also includes the social and economic factors.

Appendix E. Domestic food safety practices and eating outside the home

In all the regression tables below we have shown the final model including all social and economic factors in Table B5. We have highlighted that the factor in the model is significant (has a p value of less than 0.05) using an asterix. A statistically significant factor means the outcome of the model varies according to that factor. If the factor is significant we can then look at the p-values for each of the categories within each factor, if the p-value for a category is less than 0.05 then the category is significantly different from the reference category.

Table E1 Use of a food hygiene rating scheme (FHRS) by age

Base: 2012	**Age**		
	16-34	**35-64**	**65+**
	%	%	%
Eaten out in the last 7 days and used FHRS in last 12 months	14	10	5
Unweighted base	*685*	*1164*	*421*
Weighted base	*901*	*1150*	*361*
Not eaten out in the last 7 days and used FHRS in last 12 months	18	8	3
Unweighted base	*101*	*480*	*378*
Weighted base	*105*	*424*	*287*

Table E2 Value of a food hygiene rating by age

Base: 2012	**Age**		
	16-34	**35-64**	**65+**
	%	%	%
Eaten out in the last 7 days and used FHRS in last 12 months	25	29	28
Unweighted base	*925*	*1493*	*585*
Weighted base	*1211*	*1466*	*481*
Not eaten out in the last 7 days and used FHRS in last 12 months	25	22	21
Unweighted base	*143*	*639*	*498*
Weighted base	*150*	*619*	*378*

Table E3 Use of a food hygiene rating scheme (FHRS) by gender		
Base: 2012	**Gender**	
	Male	**Female**
	%	%
Eaten out in the last 7 days and used FHRS in last 12 months	12	9
Unweighted base	*921*	*1349*
Weighted base	*1183*	*1229*
Not eaten out in the last 7 days and used FHRS in last 12 months	10	6
Unweighted base	*394*	*567*
Weighted base	*395*	*424*

Table E4 Value of a food hygiene rating by gender		
Base: 2012	**Gender**	
	Male	**Female**
	%	%
Eaten out in the last 7 days and used FHRS in last 12 months	26	28
Unweighted base	*1216*	*1789*
Weighted base	*1553*	*1606*
Not eaten out in the last 7 days and used FHRS in last 12 months	18	25
Unweighted base	*518*	*764*
Weighted base	*548*	*602*

Table E5 Use of a food hygiene rating scheme (FHRS) by country				
Base: 2012	**Country**			
	England	**Wales**	**Scotland**	**NI**
	%	%	%	%
Eaten out in the last 7 days and used FHRS in last 12 months	10	16	6	32
Unweighted base	*1511*	*72*	*343*	*344*
Weighted base	*2047*	*109*	*189*	*66*
Not eaten out in the last 7 days and used FHRS in last 12 months	8	[5]	7	14
Unweighted base	*605*	*32*	*164*	*160*
Weighted base	*662*	*48*	*86*	*24*

Table E6 Value of a food hygiene rating by country				
Base: 2012	**Country**			
	England	**Wales**	**Scotland**	**NI**
	%	%	%	%
Eaten out in the last 7 days and used FHRS in last 12 months	27	41	20	31
Unweighted base	*1972*	*105*	*456*	*472*
Weighted base	*2662*	*154*	*254*	*89*
Not eaten out in the last 7 days and used FHRS in last 12 months	23	[23]	16	20
Unweighted base	*820*	*45*	*216*	*201*
Weighted base	*944*	*66*	*110*	*30*

Table E7 Multiple linear regression: Overall IRP score and perceived safety when eating out					
Base: 2012					
Factor	**Category**	**Coeff**	**95% CI**		**p**
			Lower	**Upper**	
When you eat out how safe is the food compared to at home*	More safe (Ref.)	0.0			
	About the same	4.9	2	7.8	0.001
	Less safe	5.9	3.1	8.8	<0.001
Unweighted base					*2722*
Weighted base					*2685*

* Factor is significant at the 5% level.

Model also includes the social and economic factors.

Table E8 Multiple linear regression: Overall IRP score and use of food hygiene rating scheme

Base: 2012

Factor	Category	Coeff	95% CI		p
			Lower	Upper	
Use a rating scheme when eating out*	No (Ref.)	0.0			
	Yes	4.8	2.8	6.8	<0.001
Unweighted base					*2997*
Weighted base					*2929*

* Factor is significant at the 5% level.

Model also includes the social and economic factors.

Appendix F. Questions from Food and You survey

F.1 Questions on food safety

Looking at this screen, do you get information about how to prepare and cook food safely at home from any of these sources?
PROBE: What about any other sources?
MULTICODE & RANDOMISE. CODE ALL THAT APPLY
Family and friends
School / college / a course
Work
Retailers (e.g. supermarkets)
Newspapers
News websites
Food TV shows / cooking programmes
Food magazines
Food websites
TV / radio campaigns
Books
Internet search engine
Product packaging
Doctor / GP
Other (specify)
I don't look for information on food safety

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?
PROBE: "Where else?"
CODE ALL THAT APPLY. MULTICODE & RANDOMISE.
Family and friends
School / college / a course
Work
Retailers (e.g. supermarkets)
Newspapers
News websites
Food TV shows / cooking programmes
Food magazines
Food websites
TV / radio campaigns
Books
Internet search engine
Product packaging
Doctor /GP
Other (specify)
Don't know

F.2 Questions on food price

Please tell me how much you agree or disagree with the following statements.
READ OUT
Definitely agree
Tend to agree
Neither agree nor disagree
Tend to disagree
Definitely disagree
Don't know
RANDOMISE LIST
Good health is just a matter of good luck
I don't really think about what I eat
The experts contradict each other over what foods are good or bad for you
What you eat makes a big difference to how healthy you are
The price of food doesn't really matter as long as I know that the quality is good
I enjoy cooking and preparing food
I don't have time to spend preparing and cooking food
When preparing food for myself I could be more careful about hygiene.

F.3 Questions on food production

Which of the following have you heard of in relation to food production?
MULTICODE RANDOMISE ORDER. CODE ALL THAT APPLY
Animal cloning
Genetic modification (GM)
Irradiation
Nanotechnology
None of these
Don't know

FOR EACH TECHNOLOGY SELECTED
How much do you agree or disagree with the following statement?
I feel knowledgeable about the use of <<TECHNOLOGY>> in food production
SINGLE CODE.
Definitely agree
Tend to agree
Neither agree nor disagree
Tend to disagree
Definitely disagree
Don't know

F.4 Questions on eating habits

Which, if any, of the following applies to you? Please state all that apply.
RANDOMISE ORDER, BUT ALWAYS KEEP VEGETARIAN STATEMENTS TOGETHER.
CODE ALL THAT APPLY.
Completely vegetarian
Partly vegetarian
Vegan
Allergic to certain food

On a diet trying to lose weight
Avoid certain food for religious or cultural reasons
Avoid certain food for medical reasons
Other (SPECIFY)
None

F.5 Questions on eating outside the home

Thinking about this definition of eating out, generally, when you're deciding where to eat out, which of the following are important to you?
CODE ALL THAT APPLY
I never eat out at all
Price
Recommendations or invitation from someone you know/good reviews
Nutritional information of the food is provided
Healthy foods/choices
Cleanliness and hygiene
Good service
A good hygiene rating/score
Food for restricted diets such as Vegetarian, Halal, Kosher etc.
None of these
Something else (SPECIFY)

Have you ever seen any of these before?
RANDOMISE ORDER OF IMAGES
LIST
Scotland FHIS image
FHRS image
Scores on the doors image
Yes
No

I have just shown you some images that are examples of food hygiene rating schemes. In the last 12 months, have you used a food hygiene rating scheme, like the ones you have just seen, to check an establishment's hygiene standards before deciding to visit?
INTERVIEWER PROMPT IF NECESSARY: By food establishment, we mean restaurants, cafes, takeaways, hotels and food shops
Yes
No