

Eating safe and well: links between nutrition and food safety practices

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Eating safe and well: links between nutrition and food safety



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Key findings

Analyses were carried out on data from Food and You Waves 1 and 2 (collected in 2010 and 2012 respectively) to examine whether relationships exist between reported food safety and nutrition practices and, if so, what is the nature of these relationships?

Food and You is a biennial, random probability, cross-sectional survey of approximately 3000 adults (16 years and over) living in private households in the UK and is commissioned by the Food Standards Agency (FSA). The surveys include many questions on reported food safety behaviour, knowledge and attitudes both in the home and when eating out. They also include questions covering nutrition, such as fruit and vegetable consumption, knowledge of healthy eating recommendations and attitudes to healthy eating.

Links between reported domestic food safety practices and reported nutrition-related behaviours

Overall, people's reported nutrition-related behaviours (such as fruit and vegetable consumption, or being vegetarian) and shopping frequency do not appear to be linked to whether or not they report practices which are in line with recommended food safety practices. Descriptive analysis showed that the more often people cooked for others the more likely they were to report behaviours in line with recommended practice and this association remained significant after controlling for socio-demographic and socio-economic factors.

Links between reported domestic food safety practices and knowledge of healthy eating recommendations

People's knowledge of healthy eating recommendations (specifically the '5-a-day' message and the eatwell plate) was linked to whether or not they reported behaviours in line with recommended food safety practices. Descriptive analysis showed that the people who demonstrated knowledge in line with recommended practice were more likely to report behaviours in line with recommended practice and this association remained significant after controlling for socio-demographic and socio-economic factors.

Links between reported domestic food safety practices and attitudes towards healthy eating

Links were identified between some attitudes and the extent to which people reported behaviours in line with recommended food safety practices. Respondents who perceived their diet as healthy and those with less complacent views on healthy eating were more likely to report behaviours in line with recommended practice.

Links between safe and healthy food when eating outside the home

People who reported that they would like more information displayed about healthy options in catering establishments when eating out were more likely to report valuing a good food hygiene rating and using a food hygiene rating scheme. However, perceptions of whether or not food eaten out was considered to be more or less healthy than that eaten at home did not predict whether respondents reported valuing a good food hygiene rating nor using a food hygiene rating scheme.

1 Introduction

1.1 Background

The Food Standards Agency's (FSA) 2010-2015 strategy includes the aim of improving the awareness and use of messages about good hygiene practices at home. Prior to 2010, the FSA was responsible for nutrition policy across the UK. However, in 2010 the responsibility for nutrition in England and Wales was moved to the Department of Health and Welsh Government respectively. In Scotland and Northern Ireland the FSA retains responsibility for nutrition and the promotion of healthy eating in addition to improving domestic food hygiene practices. The improvement of food hygiene and healthy eating practices have mostly been targeted separately in messaging campaigns and other interventions, but a 2011 evidence review by Greenstreet Berman (GSB) of food safety practices in the home suggests a correlation between attitudes and practices relating to food safety and other consumption practices, including healthy eating.¹ NatCen's previous analysis of the food hygiene data from the Avon Longitudinal Survey of Parents and Children (ALSPAC) also showed that mothers with children who persistently did not wash hands before eating were also more likely to add salt to their child's food.² Again this suggests a possible link between food safety and dietary practices that requires further examination as it has implications for the design and targeting of messaging campaigns – which and whose practices should be targeted and how?

Within medical sociology there has long been criticism of the concept of health behaviours, i.e. the notion that our practices relating to health and diet are somehow compartmentalized, more conscious and “rational” than the rest of our everyday activities and practices.³ This has also been called the “fallacy of the separate capsules”.⁴ More specifically Murcott has commented on the artificial boundaries created in food studies by the focus on specific attributes of food and its uses.⁵ The Kitchen Life study commissioned by the FSA endorses these critiques.⁶ Using observational and qualitative methods to explore people's everyday kitchen practices at home, the study showed that these practices are routine, largely non-reflexive and are “entangled” with other practices and social contexts. Cooking, cleaning and eating practices were found to be blurred with each other as well as other activities, such as feeding pets and mending bicycles, in the flow of everyday life. The focus of this report is to explore the hypothesis that people's reported practices relating to food safety and nutrition are linked, using further analysis of the Food and You survey data.

¹ Greenstreet Berman (2011) Food safety behaviours in the home. Final report for the Food Standards Agency CL2351 R4 V6 FCA. London: FSA.

² Hall J, d'Ardenne J, Barnes M., Roberts C., McManus S. (2011) Longitudinal data on food related issues: A scoping review. NatCen: London.

³ Ioannou S. (2005) Health logic and health-related behaviours. *Critical Public Health*. 15(3): 263-273.

⁴ Polgar S. (1962) Health and human behaviour: areas of interest common to the social and medical social sciences. *Current Anthropology*. 3(2): 159-205.

⁵ Murcott A. (2013) A burgeoning field: introduction to *The Handbook of Food Research*. Chapter in Murcott A et al. (eds) *The Handbook of Food Research*. Bloomsbury: London.

⁶ Wills W, Meah A, Dickinson A, Short F (2013) Domestic kitchen practices: Findings from the 'Kitchen Life' study. University of Hertfordshire: Hatfield.

1.2 Aims of this report

The aim of this project is to examine whether relationships exist between food safety and nutrition practices. The FSA identified the following areas of investigation:

- 1) Links between reported domestic food safety practices and reported nutrition-related behaviours and shopping and cooking behaviours
- 2) Links between reported domestic food safety practices and knowledge of healthy eating recommendations
- 3) Links between reported domestic food safety practices and attitudes towards healthy eating
- 4) Links between reported food safety practices outside the home and reported nutrition-related behaviours

In addition, this report looks at how knowledgeable people are about healthy eating recommendations, to what extent they follow healthy eating advice and whether people's attitudes to healthy eating relate to reported behaviours.

Within these four areas the analysis controls for several social and economic factors (see Table B1 Appendix B).

1.3 Data used in this report

Food and You is a biennial, random probability, cross-sectional survey of adults (16 years and over) living in private households in the UK.⁷ The Food and You surveys are the FSA's main source of quantitative data for investigating the relationships between attitudes, reported behaviour and knowledge of food issues and food safety practices. The survey provides data on domestic food safety practices and wider reported practices, attitudes and knowledge, including food safety outside the home.

The Food and You surveys contain questions covering diverse aspects of nutrition, falling broadly into three areas:

- Eating, cooking and shopping habits
- Knowledge of healthy eating recommendations
- Attitudes to healthy eating including facilitators and barriers to change

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 (see section 1.4).

This report uses the Food and You Waves 1 and 2 dataset to carry out descriptive and multiple regression analyses to examine whether relationships exist between reported food safety and nutrition practices.

As this project consists of further analysis of a dataset in the public domain, specific ethical approval was not required. The FSA complies with UK Privacy Laws, including the Data Protection Act 1998. The Food and You fieldwork contractor complies with the MRS code of practice.

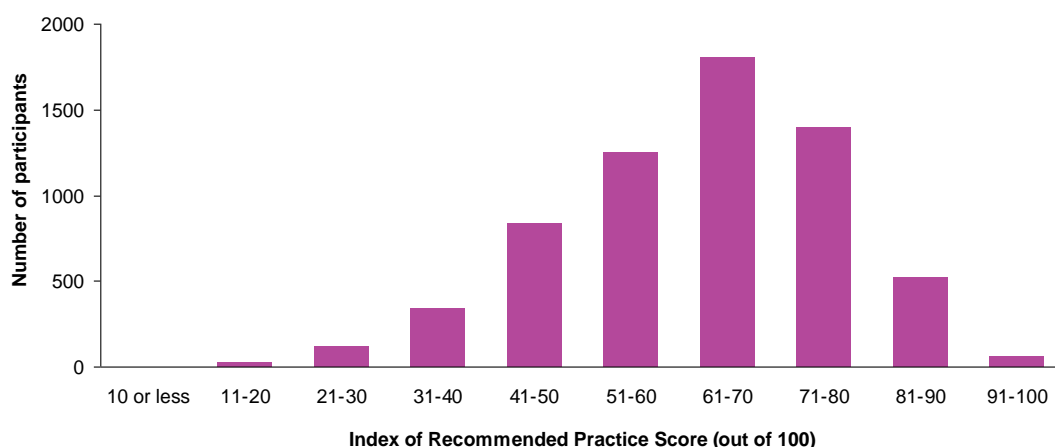
⁷ For further information on Food and You and links to the reports see:
<http://www.food.gov.uk/science/research/ssres/foodandyou/>

1.4 Index of Recommended Practice

The FSA has developed a ten-item composite measure of food hygiene practices within the home (the Index of Recommended Practice - IRP) to track the extent to which reported domestic food safety behaviours are in line with recommended practice over waves of the survey. Each item scores 1 for responses in line with recommended practice or 0 for responses not in line with recommended practice. 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.⁸ A higher score indicates more reported behaviours that are in line with recommended practice. The IRP has been used to understand variation in domestic food safety practice, particularly among population sub-groups.⁹ Details of the content and scoring of the IRP can be found in Appendix A.

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 analyses have 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 reported nutrition-related behaviours and knowledge and attitudes towards healthy eating are examined in the models as predictor variables.

⁸ The IRP provides a composite measure of food safety practices where a higher score indicates a greater proportion of practices which are in line with recommended practice. While the IRP can provide an indication of the extent to which food safety practices are in line with recommended practice, it is not able to provide a definitive indication of what does, and does not, happen in a person's kitchen. As such, it is difficult to quantify the precise meaning of a difference in IRP score between two groups of people. What the IRP is able to indicate is that there is a difference relating to food safety practices between groups, and, where necessary, further research can be conducted to explore the nature of these differences.

⁹ Roberts C, Calcutt E, Hussey D, Howard M, McManus S. (2014) Understanding domestic food safety practices. Published online. http://www.foodbase.org.uk/admintools/reportdocuments/869-1-1612_Understanding_domestic_food_safety_practices_report_FINAL_with_cover.pdf

1.5 Presentation and interpretation of the data

- The survey data used in this report have been weighted using survey-specific weighting variables.⁷ 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 a full 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, percentages in tables and figures are rounded to the nearest whole percent. Row or column percentages and counts may not add to the sum of each cell percentage and count because of rounding.
- Not all questions are asked of all participants. For example, questions about fruit and vegetable consumption and knowledge of healthy eating recommendations were only asked of participants in Scotland and Northern Ireland in Wave 2.¹⁰ This means that the sample size and composition of the group being analysed varies. The group to which 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 relationship between two categorical factors without adjusting for the impact of other factors. Significance was tested using chi-squared.
- Both linear and logistic regression analysis 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.

¹⁰ This is due to the FSA's change of remit in 2010, whereby at Wave 2 of data collection nutrition policy was no longer the responsibility of the FSA for England and Wales.

-
- 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.
 - The multiple regression models presented in this report, control for the following factors: age, gender, region, education levels, 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. Survey wave has not been controlled for in every regression model – where it has been included this is stated. These factors are included in the model in order 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 Appendix B.
 - Where the predictor variables remained significantly associated with the outcome variable after controlling for the social and economic factors, this relationship was looked at by some population sub-groups, namely age, gender and country of residence

2 Links between reported domestic food safety practices and nutrition-related behaviours

This chapter begins by looking at the association between reported fruit and vegetable consumption and other eating habits. It then goes on to discuss the relationship between reported nutrition-related behaviours and overall domestic food safety practices. A full list of the questions used in these analyses is provided in Appendix H.

2.1 Eating habits

Respondents were asked three questions addressing the number of portions of fruit and vegetables that they had eaten on the previous day. The first asked how many portions of vegetables they had eaten, then they were asked about fruit juice, and finally they were asked about the number of fruit portions they had eaten. For each of these, respondents were provided with information on the amount that equates to a portion for each food type and also the foods included in each category. Around half of respondents (47%) reported eating the recommended daily number of at least five portions of fruit and vegetables.¹¹

Appendix Table C1

Participants were also asked if their eating habits or diets were restricted in any way (for instance by allergies, medical conditions, ethical or religious views): 6% reported being partially vegetarian/completely vegetarian/vegan, and 5% reported having a food allergy. These are slightly higher than the prevalence rates reported in the National Diet and Nutrition Survey (NDNS).¹²

Descriptive analysis, which does not take account of other factors, showed that those who were vegetarian or vegan were significantly more likely to report achieving the 5-a-day recommendation (56%) compared with those who were not (47%).

Appendix Tables C2 and C3

Similarly, descriptive analysis showed that those who reported being allergic to certain foods were also significantly more likely to report achieving the 5-a-day recommendation (55%) compared with those who did not report food allergies (47%).

Appendix Table C4

It is important to note that the allergy question in Food and You only refers to the participant, rather than anyone else in their household, for example a child. This is important to note as the presence of anyone in the household with a food allergy could potentially affect food safety behaviours of other members of the household. The question also does not ask whether the allergy has been clinically diagnosed. Food and You 2014 includes new questions that ask if anyone in the household has a food allergy and whether allergies have been clinically diagnosed, which should allow for more in-depth analysis in the future.

¹¹ This figure is much higher than the 27% reported for adults aged 16 years and over in 2011 of the Health Survey for England, 20% reported in the 2012 Scottish Health Survey and 32% in the Health Survey Northern Ireland. All surveys ask participants about individual foods that contribute to five portions but HSE asks more detailed questions including separating fresh, tinned and dried fruit and the portion size.

¹² Combined data from years 1 to 3 of the National Diet and Nutrition Survey (NDNS) found 2% of the UK population classed themselves as vegetarian and 2% reported having a food allergy.

2.2 Nutrition related behaviours and IRP

It was hypothesised that certain nutrition-related behaviours would be associated with domestic food safety practices. The following self-reported nutrition-related behaviours were used to investigate any possible relationship with reporting domestic food safety practices in line with recommended practice (as measured by the IRP score): the number of portions of fruit and vegetables consumed, being a vegetarian, and having a food allergy. The following sections look at the relationship between each of these nutrition-related behaviours and the extent to which reported food safety behaviours are in line with recommended practice.

2.2.1 Fruit and vegetable consumption

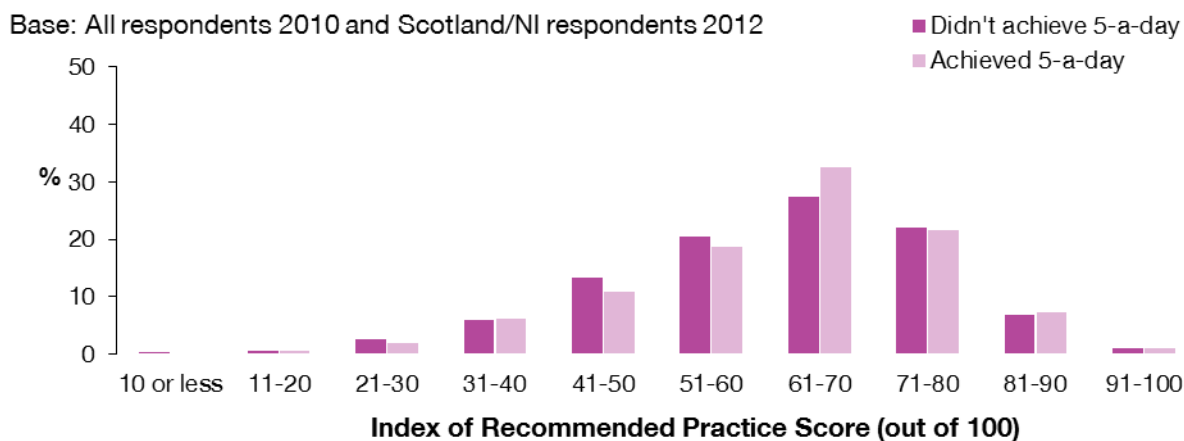
It was hypothesised that people who reported eating the recommended number of daily portions of fruit and vegetables were more likely to report behaviour in line with domestic food safety recommended practice. It is recommended the people should eat 5 or more portions of fruit and vegetables per day.

Descriptive analysis showed that people who reported achieving the 5-a-day recommendation were more likely to report food safety practices in line with recommended practice (as indicated by a significantly higher IRP score, by an average of 1.3 points out of 100).

Appendix Table C1

The figure below illustrates this result by showing the distribution of the overall IRP score, split by whether the 5-a-day recommendation was achieved or not. There was a larger proportion of people who achieved the 5-a-day recommendation with an IRP score of 61 or more.

Distribution of overall IRP scores split by achieving 5-a-day



Appendix Table C5

Regression analysis showed that once age, gender and country of residence were controlled for, the difference in the extent to which respondents reported behaviours in line with recommended practice between those who reported achieving the 5-a-day recommendation and those who did not was no longer significant. In particular, the regression model highlights that the relationship between fruit and vegetable consumption and the extent to which respondents reported behaviours in line with recommended practice is largely explained by gender, with women being more likely to report behaviours in line with recommended practice than men; when the data are split by gender, and the presence of a relationship is considered separately for men and

women, no relationship between achieving 5-a-day and the extent to which reported behaviours were in line with recommended practice is evident.

When the other social and economic factors are also controlled for, there is also no significant difference in the extent to which reported behaviours are in line with recommended practice between those who achieved the 5-a-day and those who did not.

Appendix Table C6

2.2.2 Vegetarianism

It was hypothesised that people who reported that they were vegetarian/vegan were more likely to report behaviour in line with domestic food safety recommended practice. Both descriptive and regression analysis showed that although, on average, vegetarians were more likely to report behaviours in line with recommended practice than non-vegetarians, this difference was not significant. There remained no significant association when age, gender, country of residence and the social and economic factors are controlled for.

Appendix Tables C2 and C7

3 Links between reported domestic food safety practices and shopping and cooking

This chapter looks at the relationship between frequency of food shopping and whether people cook or prepare food for themselves and the extent to which reported food safety behaviours are in line with recommended practice. A full list of the questions used in these analyses is provided in Appendix H.

3.1.1 Shopping behaviours

Participants were asked how often they (or someone else in their household) did a 'main food shop' – the shopping trip when they buy the largest amount or spend the most money on food.¹³ Over half (58%) said that they did their main shop about once a week; this pattern is replicated across age groups and household types.¹⁴

It was hypothesised that constraints on shopping were likely to encourage certain domestic food safety practices which are not in line with recommended practice, for example, eating food which is past its use-by date. In particular, analysis was performed to test the hypothesis that people who shop more frequently are more likely to report behaviours in line with recommended practice.

Descriptive analysis showed that the extent to which reported behaviours were in line with recommended food safety practice vary significantly according to how often people shop. Contrary to the hypothesis, those who shopped more than once a week were less likely to report food safety practices in line with recommended practice than those who shopped about once a week.

Appendix Table D1

The outcome was similar when age, gender, country of residence, household size and presence of children in the household were controlled for in the regression model. Once the other social and economic factors were also controlled for, frequency of shopping was no longer significantly related to the extent to which respondents reported practices in line with recommended practice (as measured by IRP score).

Appendix Table D2

In addition to the above, it was hypothesised that shopping behaviour would be related to specific individual food safety behaviours. The hypothesis was that those who shop more frequently are more likely to report behaviours in line with recommended practices with respect to; checking use-by-dates, use of leftovers¹⁵ and length of time keeping high-risk foods (sliced/cured meat, meat pate, fresh dip, fish and soft cheese) once opened.¹⁶

Descriptive analysis showed that frequency of main food shop was not significantly associated with reporting behaviours in line with recommended practice for checking use-by-dates or keeping high-risk foods once opened, but there was a significant

¹³ Shopping habits questions were asked of a random third of Wave 1 participants and all Wave 2 participants.

¹⁴ Unweighted bases in some subgroups were less than 50.

¹⁵ It is recommended that leftovers be eaten within two days

¹⁶ It is recommended that these foods should be eaten within 2 days unless the label indicates otherwise

difference in the proportion of people who reported behaviours relating to eating left-overs in line with recommended practice by frequency of shop. Please note however that no systematic pattern to the odds ratios was evident, and we should avoid over-interpretation of this result.

Once age, gender, country of residence and the other social and economic factors were controlled for, frequency of shopping was no longer significantly related to eating left-overs in line with recommended practice. This suggests that infrequent shoppers are not more likely to report domestic food safety practices which are not in line with recommended practice, for example eating leftovers after it is safe to do so.

Appendix Tables D3 to D9

3.1.2 Cooking behaviour

Participants were asked how often they cooked or prepared food for themselves and how often they cooked or prepared food for others. Only 9% of participants reported that they cooked for themselves once a month or less while 25% reported cooking once a month or less for others. It was hypothesised that those who cooked once a month or less were less likely to report behaviours in line with recommended food safety practice.

Descriptive analysis showed that the extent to which reported behaviours were in line with recommended practice vary according to how often participants cook for themselves. Those who cooked for themselves at least once a day were more likely to report behaviours in line with recommended practice (as indicated by a significantly higher IRP score, by an average of 2.5 points out of 100), than those who cooked once a month or less.

Appendix Table D10

Once age, gender and country of residence were controlled for, frequency of cooking for oneself was no longer significantly related to the extent to which reported behaviours were in line with recommended practice. In particular, the regression model highlights that the relationship between those who cook and the extent to which reported behaviours were in line with recommended practice is largely explained by gender, with women being more likely to report behaviours in line with recommended practice and be more likely to cook than men; when the data are split by gender, and the presence of a relationship is considered separately for men and women, no relationship between frequency of cooking for oneself and the extent to which reported behaviours were in line with recommended practice is evident.

The result is the same when the other social and economic factors are also controlled for, with no significant difference in the extent to which reported behaviours are in line with recommended practice between those who cooked and those who did not.

Appendix Table D11

Looking at frequency of cooking for others, descriptive analysis showed that participants who cooked for others more than once a month were more likely to report behaviours in line with recommended practice than those who cooked for others once a month or less.

Appendix Table D10

Regression analysis showed that once age, gender and country of residence were controlled for, there was still a significant difference in the extent to which reported behaviours were in line with recommended practice and frequency of cooking for others. When the other social and economic factors were also controlled for the extent to which reported behaviours were in line with recommended practice still significantly

varied according to frequency of cooking for others. In particular there was a significant difference in whether reported behaviours were in line with recommended practice between those who cooked for others 3-6 times a week or more and those who cooked for others once a month or less.

Appendix Table D129

4 Links between reported domestic food safety practices and knowledge of healthy eating recommendations

Healthy eating advice centres on a selection of key recommendations and principles, namely; the eatwell plate, the ‘8 tips for eating well’, eating at least five portions of fruit and vegetables a day and the recommended maximum daily allowance of salt and calories for adults. In England and Wales advice is made available via the NHS Choices website, which also has a link to advice on food safety.¹⁷ In Scotland the FSA’s ‘eat well Scotland’ website¹⁸ provides advice on healthy eating and food safety. In Northern Ireland, advice on healthy eating can be found on the NI Public Health Agency website ‘Choose to Live Better’¹⁹ and the NI Direct website ‘Eatwell’ section²⁰ provides advice on healthy eating and food safety.

As discussed in the introduction, a possible link between differing sets of knowledge, attitudes and practices was found in the Greenstreet Berman review and other studies that have found a “bundling up” of food safety and other food-related practices. This chapter explores the possible link between knowledge of healthy eating recommendations and the extent to which reported behaviours are in line with recommended domestic food safety practices. A full list of the questions used in these analyses is given in Appendix H.

4.1 Eatwell plate and reported domestic food safety practices

The eatwell plate is a pictorial representation of the different types of food that make up our diet, and shows the proportions we should eat them in to have a well-balanced and healthy diet.

The eatwell plate is based on five food groups:

- bread, rice, potato, pasta and other starchy foods
- fruit and vegetables
- milk and dairy products
- meat, fish, eggs, beans and other non-dairy sources of protein
- foods and drinks high in fat and/or sugar

¹⁷ <http://www.nhs.uk/livewell/healthy-eating/Pages/Healthyeating.aspx>.

¹⁸ <http://www.eatwellscotland.org/>

¹⁹ <http://www.choosetolivebetter.com/>

²⁰ <http://www.nidirect.gov.uk/index/information-and-services/health-and-well-being/eatwell>

The eatwell plate



Participants were asked to correctly identify the proportions of each of the five food groups that contribute to the eatwell plate. The majority of participants (85%) placed three or more food groups in the correct proportions.

Descriptive analysis showed that the people who correctly identified the proportions for three or more food groups were more likely to report behaviours in line with recommended practice (as indicated by a significantly higher IRP score, by an average of 4.5 points out of 100), than those who identified a maximum of two food groups.

Appendix Table E1

Even when social and economic factors were also controlled for in a multiple linear regression model, the significant difference remained, with those who correctly identified the proportions for three or more foods having a significantly higher IRP score, by an average of 2.8 points out of 100.

Appendix Table E2

In order to inform the targeting of health promotion information it is important to examine how knowledge of the eatwell plate varies between socio-demographic groups. A multiple linear regression model (see Appendix C, Table C2) was used to generate a regression-smoothed IRP score for someone with and without knowledge of the proportions of different food groups that are recommended to make up a healthy diet by gender, age group and country of residence.^{21 22}

For both men and women, it was observed that the regression-smoothed IRP score was 4 points higher for those who correctly identified three or more food groups compared with those who identified a maximum of two food groups.

²¹ Regression-smoothed means have been presented by age, gender and country rather than directly measured mean scores, due to some small sample sizes

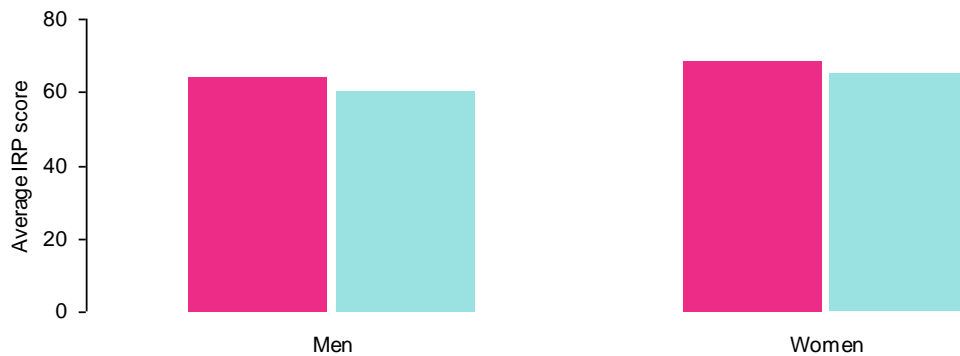
²² The multiple linear regression model generates a regression-smoothed IRP score for someone in a specific socio-demographic group, whilst controlling for all the other social and economic factors. For example, it models the IRP score for a woman with and without knowledge of the eatwell plate while controlling for age, country and the other social and economic factors, given in Table B1.

Regression-smoothed IRP scores by gender and knowledge of eatwell plate

Base: All respondents 2010 and Scotland/NI respondents 2012

Three or more

Two or less



Appendix Table E3

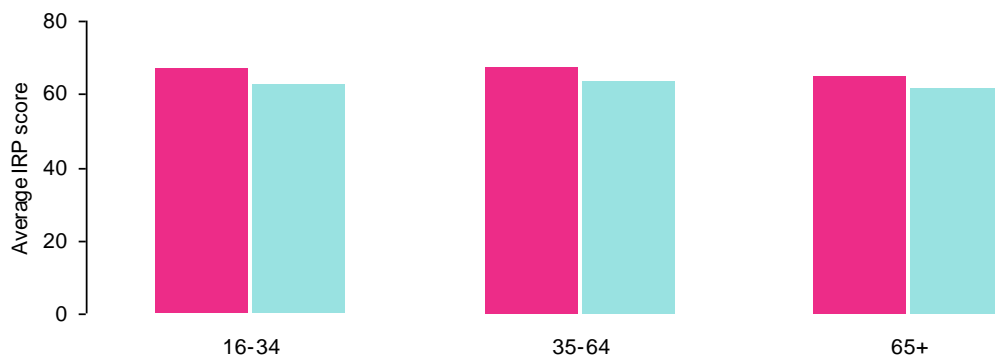
The regression-smoothed IRP score for someone aged 16 to 34 was 6 points higher for those who correctly identified three or more food groups compared with those who identified a maximum of two food groups correctly. In the older age groups the difference was smaller: between 3-4 points higher.

Regression-smoothed IRP scores by age and knowledge of eatwell plate

Base: All respondents 2010 and Scotland/NI respondents 2012

Three or more

Two or less



Appendix Table E4

Across all countries, it was observed that the regression-smoothed IRP score was 4-5 points higher for those who correctly identified three or more food groups compared with those who identified a maximum of two food groups.

Regression-smoothed IRP scores by country and knowledge of eatwell plate

Base: All respondents 2010 and Scotland/NI respondents 2012

■ Three or more

■ Two or less



Appendix Table E5

4.2 Fruit and vegetables

Participants were asked how many portions of fruit and vegetables health experts recommend people should eat every day. Experts recommend that people should eat at least five portions of fruit and vegetables per day. The majority (86%) responded with five or more, and, around half (49%) of the people who responded five or more also reported eating five or more portions on the previous day.

Appendix Tables E6 and E7

Descriptive analysis showed that the people who said health experts recommended people should eat five or more portions of fruit and vegetables every day²³ were more likely to report behaviours in line with recommended practice (as indicated by a significantly higher IRP score, by an average of 5.5 points out of 100), than those who did not.

Appendix Tables E6

Once the social and economic factors were also controlled for in a multiple linear regression model, the significant difference in the extent to which reported behaviours were in line with recommended practice remained, with those who correctly identified the recommended number of portions, having a significantly higher IRP score, by an average of 3.3 points out of 100.

Appendix Table E8

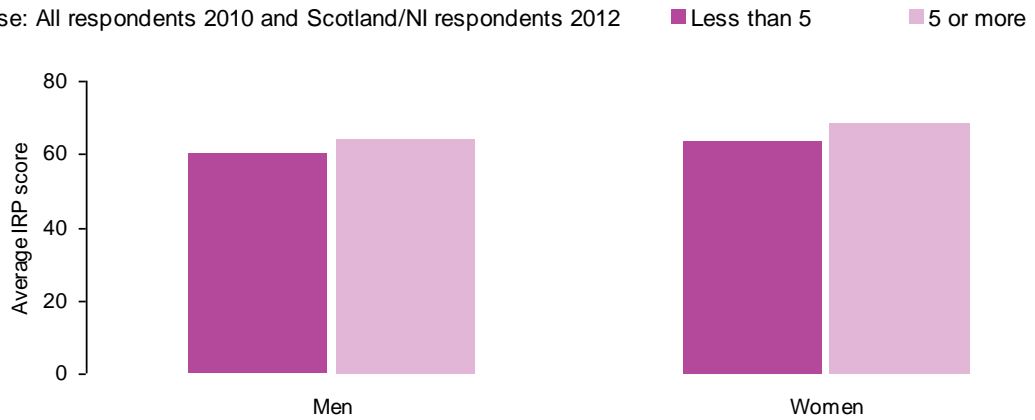
It is of particular interest to analyse how the relationship between knowledge of this healthy eating advice and reported food safety practices differs by certain socio-demographic groups. We used a multiple linear regression model (see Appendix C, Table C7) to generate a regression-smoothed IRP score for someone with and without knowledge of the recommended number of portions of fruit and vegetables by gender, age group and country of residence.

²³ The question allows participants to give any number. As the recommendation is five or more portions it was decided for the purposes of this analysis that any number above five would be classified as knowing the recommendation.

It was observed that the regression-smoothed IRP scores were between 4-6 points higher for those who knew the recommended number of portions compared with those who did not.

Regression-smoothed IRP scores by gender and knowledge of recommended portions of fruit and vegetables

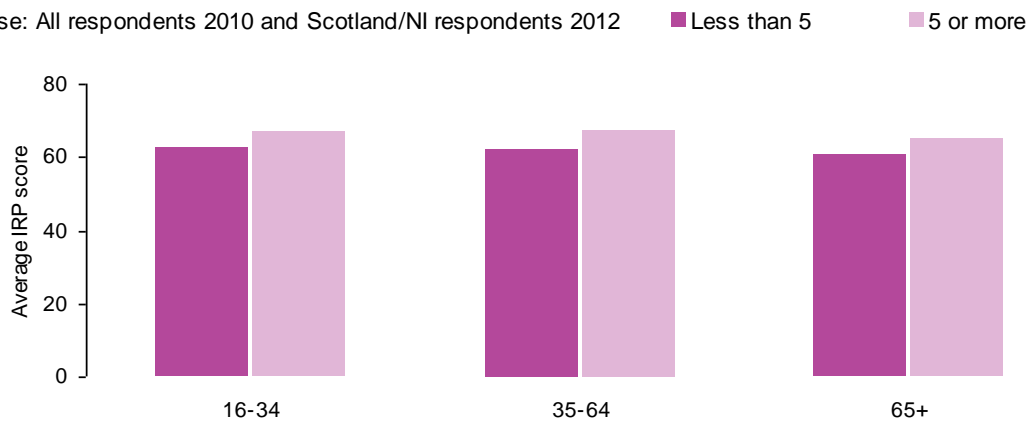
Base: All respondents 2010 and Scotland/NI respondents 2012



Appendix Table E9

Regression-smoothed IRP scores by age and knowledge of recommended portions of fruit and vegetables

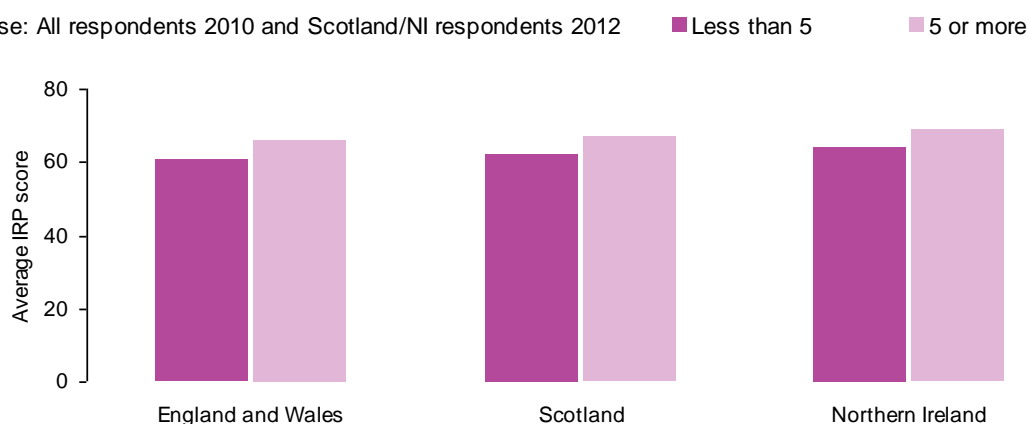
Base: All respondents 2010 and Scotland/NI respondents 2012



Appendix Table E10

Regression-smoothed IRP scores by country and knowledge of recommended portions of fruit and vegetables

Base: All respondents 2010 and Scotland/NI respondents 2012



Appendix Table E11

4.3 Salt

Participants were asked what they thought the recommended maximum daily allowance of salt was. Experts recommend that people should eat no more than 6 grams of salt per day. A tenth (10%) of participants gave the correct answer while 33% gave a figure of less than 6g and 17% a figure of more than 6g. A large number of people (40%) answered 'Don't know' to this question. Once these people were excluded from the analysis, 16% gave the correct figure of 6g, 56% gave a figure of less than 6g with the remaining quarter (28%) giving a figure of more than 6g.

Descriptive and regression analysis showed that knowledge of the recommended maximum daily allowance of salt per day was not significantly associated with the extent to which respondents reported behaviours in line with recommended practice.

Appendix Tables E12 and E13

4.4 Calories

Participants were asked what they thought the recommended daily number of calories was for an average woman and an average man. It is recommended that the average woman should consume 2000 calories per day and the average man should consume 2500. Around a quarter (27%) of participants gave the correct answer to the number of calories for a woman and the same proportion gave the correct answer to the number of calories for a man. A third of participants answered 'Don't know' to both questions.²⁴ Once these people were excluded from the analysis, 40% gave the correct figure of 2000 calories for a woman and 39% gave the correct figure of 2500 calories for a man. The analysis showed that women were more likely than men to know the recommendation for women's daily calories (45% compared with 34%), whereas the proportion of men and women who knew the correct recommendation for men's daily calories was similar (39% compared with 40%).

Descriptive analysis showed that people who did not know the recommendation for the average daily calories for a woman (i.e. said less or more than 2000 calories) were less

²⁴ The majority of respondents who did not know one recommendation did not know the other.

likely to report behaviours in line with recommended practice (as indicated by a significantly lower IRP score) than those who gave the correct answer. In particular, those who said the recommendation was more than 2000 calories were the least likely to report practices in line with recommendations.

Appendix Table E14

Regression analysis showed that once gender, age and country of residence were controlled for, there was still a significant difference in the extent to which reported behaviours were in line with recommended practice between those who knew the correct recommendation and those who thought the recommendation was more than 2000 calories. However once the other social and economic factors were also controlled for there was no significant difference in IRP score between those who knew the recommendation and those who did not.

Appendix Table E15

Descriptive analysis showed that participants who did not know the recommendation for the average daily calories for a man (i.e. said less or more than 2500 calories) were less likely to report behaviours in line with recommended practice (as indicated by a significantly lower IRP score) than those who gave the correct answer. In particular, those who said the recommendation was more than 2500 calories were the least likely to report practices in line with recommendations.

Appendix Table E14

Regression analysis showed that once age, gender and country of residence were controlled for, there was still a significant difference in the extent to which reported behaviours were in line with recommended practice between those who knew the correct recommendation and those who did not. Once the other social and economic factors were also controlled for the extent to which reported behaviours were in line with recommended practice still significantly varied according to knowledge of the recommendation for the average daily calories for a man. In particular there was a significant difference in whether reported behaviours were in line with recommended practice between those who knew the correct recommendation and those who thought the recommendation was more than 2500 calories.

Appendix Table E16

5 Links between reported domestic food safety practices and attitudes towards healthy eating

This chapter begins by looking at the association between attitudes towards healthy eating and reported healthy eating behaviours. It then goes on to discuss the relationship between these attitudes and overall reported domestic food safety practices. Again this was to explore the links between sets of food-related attitudes and practices suggested by the Greenstreet Berman review and other studies. A full list of the Food and You questions used in these analyses is given in Appendix H.

5.1 Attitudes to healthy eating

Participants were asked whether, in their opinion, what they usually ate was healthy or unhealthy. The majority (84%) perceived their diet as being (very or fairly) healthy and 5% (very or fairly) unhealthy. Half (47%) of participants who considered their diet to be healthy reported they consumed five or more portions of fruit and vegetables on the previous day, a significantly higher proportion than those who thought their diet was unhealthy (19%) or neither healthy nor unhealthy (24%).

Appendix Tables F1 and F2

Participants were asked whether they agreed or disagreed with the statement 'I do not need to make any changes to the food I eat because it is already healthy enough'. Half (55%) of participants agreed and a third (33%) disagreed with this statement, while 12% neither agreed nor disagreed. Descriptive analysis showed that of those who agreed their diet was already healthy enough a larger proportion (56%) reported eating five or more portions of fruit and vegetables on the previous day compared with those who neither agreed nor disagreed (40%) and those who disagreed (36%) with the statement.

Appendix Tables F3 and F4

In further analysis, the relationship between attitudes towards healthy eating and knowledge of healthy eating recommendations (see Chapter 3) was tested. Descriptive analysis showed that as the level of disagreement with the above statement (do not need to change diet) increased, so did the proportion of people with the knowledge of healthy eating advice for the eatwell plate and the recommended number of portions of fruit and vegetables.

Appendix Tables F5 and F6

5.2 Attitudes to healthy eating and reported domestic food safety practices

5.2.1 Perceptions of diet as healthy

Descriptive analysis showed that people who perceived their diet as being unhealthy (very and fairly combined) or neither healthy or unhealthy were less likely to report behaviours in line with recommended practice (as indicated by a significantly lower IRP score) than those who considered their diet healthy (very and fairly combined).

Appendix Table F1

Once the social and economic factors were also controlled for in a multiple linear regression model, the significant difference in the extent to which reported behaviours

were in line with recommended practice remained, with those who perceived their diet as unhealthy, having a significantly lower IRP score, by an average of 4.0 points out of 100.

Appendix Table F7

5.2.2 Dietary change

Descriptive and regression analysis showed that the level of agreement with the statement 'I do not need to make any changes to the food I eat because it is already healthy enough' was not significantly associated with the extent to which reported behaviours were in line with recommended food safety practices.

Appendix Tables F3 and F8

5.2.3 'Relaxed' attitudes to healthy eating

Participants were asked whether they agreed or disagreed with six statements about healthy eating. It was hypothesised that if there was a link between attitudes to healthy eating and domestic food practice then those with a less 'relaxed' attitude would be more likely to report behaviours in line with recommended practice. Two statements were selected as representing a 'relaxed' attitude to healthy eating if respondents agreed with them. These were:

- "If you are not overweight you can eat whatever you like"
- "As long as you take enough exercise you can eat whatever you want"

Descriptive analysis showed that those who definitely disagreed with each statement were more likely to report behaviours in line with recommended practice than those who said they agreed. When the social and economic factors were controlled for in a multiple linear regression model, the conclusion was the same for the first statement but there was no significant difference in IRP score between those who agreed and those who disagreed with the second statement.

Appendix Table F9 and F10

6 Links between safe and healthy food when eating outside the home

This chapter focuses on reported eating outside of the home (including eating takeaways), and in particular addresses whether nutrition-related and food safety factors are in some way associated when people are eating out. A full list of the questions used in these analyses is given in Appendix H.

6.1 Information about healthy food options

More than half (58%) of participants thought that the food they ate when eating out was less healthy compared with the food they ate at home, a significantly higher proportion than those who thought the food they ate when eating out was more healthy (7%).²⁵ Around a third (35%) of participants thought the food they ate when eating out was about the same as eating at home in terms of healthiness.

Appendix Table G1

Participants were asked if they would like to see more information displayed about how healthy the food options were in catering establishments such as restaurants, takeaway outlets and workplace canteens. The majority (77%) said they would like to see more information displayed about healthy food options. The proportion who wanted to see more information (in at least one of the types of catering outlets) was similar for those who thought eating out was less healthy than eating at home and those that thought eating out was more healthy (79-80%).

Appendix Table G2

6.2 Value of food hygiene ratings

6.2.1 Food safety and healthiness when eating out

Participants were shown a list of factors and asked what was important to them when deciding where to eat out. One of the options was a good hygiene rating and this was used as a measure of whether people valued food safety when eating out.²⁶ This measure was compared with perceived healthiness of food when eating out and whether respondents wanted to see more information displayed about healthy options.

It was hypothesised that people who thought that the food they ate when eating out was less healthy compared with the food they ate at home were more likely to report valuing a good food hygiene rating. The analysis showed that a quarter (24%) of participants who thought eating out was less healthy valued a good food hygiene rating compared with a third (31%) of those who thought eating out was more healthy. However the difference in these percentages is not statistically significant. This may be because of small numbers in the group who thought eating out was healthier.

Appendix Table G3

²⁵ Questions about eating out were asked of a random third of Wave 1 participants and as part of the healthy eating module asked of participants in Scotland and Northern Ireland in Wave 2.

²⁶ Participants reporting that a good hygiene rating / score was important to them did not necessarily know about or use specific schemes, or understand the process behind rating establishments.

It was also hypothesised that people who wanted to see more information displayed about healthy options when eating out were more likely to report valuing a good food hygiene rating. Three-quarters (75%) of participants did not report that they valued a good food hygiene rating when eating out. However, a significantly higher proportion of participants who wanted to see more information on healthy options reported valuing a good food hygiene rating (28%) compared with those who did not want to see more information displayed about healthy eating options (16%).

Appendix Table G4

6.2.2 Food safety when eating out and knowledge of healthy eating

As shown in Chapter 3, knowledge about healthy eating recommendations was associated with being more likely to report behaviours in line with recommended practice with regard to food safety practice in the home. It was hypothesised that people with knowledge of healthy eating recommendations were more likely to report valuing food safety outside the home. Valuing a food hygiene rating was compared with the two healthy eating advice questions shown to be associated with food safety in the home (see Chapter 3): knowledge of the eatwell plate and knowledge of eating at least five portions of fruit and vegetables a day. While the majority of participants did not value a good food hygiene rating when eating out, as reported in the previous section, for both knowledge questions, a higher proportion of participants with knowledge of healthy eating recommendations reported valuing a good food hygiene rating. However, the difference in these percentages is not statistically significant and so there isn't enough evidence to support the hypothesis.

Appendix Tables G5 and G6

6.3 Reported use of food hygiene rating schemes

6.3.1 Reported use of food hygiene rating schemes and perceived healthiness when eating out

In Wave 2 (2012) participants were 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 schemes in the last 12 months to check an establishment's hygiene standards before deciding to visit.²⁷ This measure was compared with perceived healthiness of food when eating out and whether respondents would like to see more information displayed about healthy options.²⁸

It was hypothesised that people who thought that the food they ate when eating out was less healthy compared with the food they ate at home were more likely to report using a food hygiene rating scheme. However there was no difference in the proportion who thought eating out was less healthy and reported using a food hygiene rating scheme and the proportion who thought eating out was more healthy (11-12%).

Appendix Table G7

²⁷ 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

²⁸ As these questions were only asked of Scotland and Northern Ireland in Wave 2, analysis is restricted to participants from these two countries only. It was not possible to look at these countries individually because of small numbers.

It was also hypothesised that people who wanted to see more information on healthy options when eating out were more likely to report using a food hygiene rating scheme. The majority (89%) of participants reported that they had not used a food hygiene rating scheme in the last 12 months. However, a significantly higher proportion of participants who wanted to see more information displayed about healthy eating options used a food hygiene rating scheme (14%) compared with those who did not want to see more information (4%).

Appendix Table G8

6.3.2 Reported use of food hygiene rating schemes and knowledge of healthy eating

It was hypothesised that people with knowledge of healthy eating recommendations - knowledge of the eatwell plate and knowledge of eating at least five portions of fruit and vegetables a day - were more likely to report using a food hygiene rating scheme. However there was no statistically significant difference in the proportion of respondents with knowledge of healthy eating that reported using a food hygiene rating scheme and the proportion who did not have the knowledge about healthy eating and that reported using a food hygiene rating scheme.

Appendix Tables G9 and G10

7 Discussion

7.1 Summary of findings

This further analysis of the Food and You data examines the broad hypothesis of a link between people's reported nutrition-related practices and their reported food safety practices.

Overall, people's reported nutrition-related behaviours such as fruit and vegetable consumption and shopping frequency do not appear to be linked to whether or not they report behaviours in line with recommended food safety practices. Where a link was observed in descriptive analysis, this disappeared in regression analyses controlling for socio-demographic and socio-economic factors. This suggests that any evident differences were explained by other factors, such as gender differences.

While frequency of cooking for oneself did not remain significantly associated with reporting behaviours in line with recommended food safety practices after controlling for socio-demographic and socio-economic factors, frequency of cooking for others did. This suggests that people are more likely to follow recommended practice when cooking for others than when they cook for themselves.

Associations between healthy eating knowledge (specifically the '5-a-day' message and the eatwell plate) and reporting behaviours in line with recommended food safety practices remained significant after controlling for other factors. This provides some limited support for the hypothesis that sets of practices and knowledge relating to food safety and healthy eating are linked, but is not conclusive.

Some attitudes to healthy eating do appear to be linked to whether or not people report behaviours in line with recommended food safety practices. Those who perceived their diet as being healthy were more likely to report behaviours in line with recommended practice than those who considered their diet unhealthy. There was a less clear association when looking at responses to particular attitudinal statements, with the only relationship remaining significant after controlling for other factors being that those who disagreed with the statement "If you are not overweight you can eat whatever you like" were significantly more likely to report behaviours in line with recommended practice than those who agreed.

Finally, when considering eating out, there was an association between wanting to see more information displayed about healthy food options in catering establishments and reported value and use of food hygiene rating schemes. Although many people do not appear to be engaged with the schemes (they do not report valuing or using the schemes), those who wanted to see more information on healthy eating options were more likely to report valuing a good food hygiene rating and more likely to use a food hygiene rating scheme. These results suggest that there is a small group of consumers who are keen to consume information about both food safety and nutrition. As such, in targeting this specific group, it could be logical and efficient for these types of information to be targeted together. Furthermore, by combining information about food safety and nutrition, we could target those consumers who would like more information about healthy food options but do not currently value or use food hygiene schemes.

7.2 Comparison with other studies

To provide a context for the analysis and to identify similar studies for comparison of these findings a literature search was undertaken to update and extend the Greenstreet Berman (GSB) review.¹ There is a huge and diverse number of studies that have examined various aspects of food and eating practices in the UK, but as noted in the introduction nearly all of these have a very specific focus looking at either food safety practices or healthy eating and other consumption practices. While no directly comparable research was identified from the UK, seven studies from other countries were identified that examined both food safety and nutrition/healthy eating and possible linkages between them. Three of these were from very different country contexts (Benin, China and Thailand) and thus not of relevance to the UK, but two recent studies from Australia, one from the USA and one comparative study were found. These were all survey reports, one of the general population in Australia,²⁹ one of middle-aged Australian adults,³⁰ and one of African American churchgoers.³¹ and a comparative study of attitudes towards food safety in Japan and the USA.³² Broadly these all found evidence of a link, but between different components: Taylor et al. found that lack of concern about the safety and quality of food were significantly associated with low consumption of fruit and vegetables; Worsley et al. found significant associations between food safety concerns and dietary habits among middle-aged Australians and suggest that food safety concerns are a mediator between demographics and personal values and the outcomes of healthy eating and physical activity; Anderson Steeves et al. examined food safety practices as the outcome and found that more risky practices were significantly associated with high BMI and lower feelings of healthy eating efficacy and healthy eating intentions. They also found a positive relationship with food knowledge, but it did not reach statistical significance. Finally Jussaume and Higgins comparative survey of consumers in Japan and the USA, explored the hypothesis that positive pro-environmental attitudes are associated with food safety concerns. While a bit older than the other studies, they found that the most significant association with food safety concerns was vegetable consumption and there was no relationship with environmental concerns or socio-economic status. They suggest the existence of a constellation of attitudes that are focused on health and that these lead to concerns about food safety, which echoes the findings of Taylor et al. and Anderson Steeves et al. As a whole, while these four studies have examined different components they support the hypothesis that knowledge, attitudes and reported practices relating to food safety and nutrition are inter-linked. However, they are all cross-sectional studies, like Food and You, and so cannot provide insights into causality and specifically the direction of the relationship.

7.3 The evidence overall

As described above this analysis of the Food and You data only found a few significant associations between nutrition and food safety variables, most notably between knowledge of healthy eating and frequency of cooking for others and conformity of

²⁹ Taylor A W, Coveney J, Ward PR, Henderson J, Meyer SB, Pilkington R, Gill TK (2012) Fruit and vegetable consumption - the influence of aspects associated with trust in food and safety and quality of food. *Public Health Nutrition*, 15(2): 208-217

³⁰ Worsley A, Wang WC, Hunter W (2013) Gender differences in the influence of food safety and health concerns on dietary and physical activity habits. *Food Policy*. 41: 184-192

³¹ Anderson Steeves E, Silbergeld E, Summers A, Chen L, Gittelsohn J (2012) Risky food safety behaviors are associated with higher BMI and lower healthy eating self-efficacy and intentions among African American churchgoers in Baltimore corrected. *PLoS one* .7(12): e52122-e52122

³² Jussaume, RA, Higgins L (1998) Attitudes towards food safety and the environment: a comparison of consumers in Japan and the U.S. *Rural Sociology*. 63(3): 394-411

reported domestic practices with recommended practices. The findings also suggest heterogeneity amongst consumers and that there may be some groups of people who value the provision of information about both food safety and nutrition. Taken as a whole, these findings do not provide definitive evidence to support the overarching hypothesis of a link between food safety and nutrition in peoples' practices, knowledge and attitudes. Rather they are suggestive. If these sets of knowledge, attitudes and practices are "bundled up" it also suggests a complexity that requires more sophisticated conceptual frameworks to capture it and develop causal explanations that avoid the assumption of simple linear associations between an "exposure" (for instance, knowledge) and "outcome" variable (for instance, healthy eating). However, the findings are endorsed by the small number of similar studies identified that examined both phenomena. The findings also mesh with the findings of the Kitchen Life study and its finding domestic practices are not compartmentalized, but rather "entangled" and recent studies on food waste have shown that waste practices need to be seen as part of wider systems of food provisioning and social relationships within the household.^{33 34} The findings are also consonant with the extensive sociology of food that illustrates how particular sets of practices need to be seen as part of wider sets of practices and that these are embedded in particular social contexts and thus vary by social group.³⁵ Thus overall the findings are suggestive and suggestive enough to warrant further consideration.

7.4 Implications for policy

While the findings from these analyses are not conclusive, they do suggest that more consideration should be given to the ways in which sets of practices, knowledge and attitudes "bundle up" and also the best ways to change them. While more needs to be known about the direction of these relationships and what lies behind them in terms of causal factors, it suggests that promotion of healthy eating and domestic food safety practices could be targeted together. Interestingly the US 2010 Dietary Guidelines incorporate food safety recommendations broadly similar to the 4Cs (key food hygiene and safety behaviours under the four areas: cooking; chilling; cross contamination; and cleaning).³⁶

The FSA's 'eat well Scotland' website and the NI Direct 'Eatwell' section of the website include information on both food safety and nutrition, but the latter is lacking from the FSA main website. Similarly there is scope for exploring whether promotion of healthy eating and food safety outside the home could be combined, and the addition of Wave 3 to the Food and You dataset will facilitate this.

While further work is needed to explore the nature of these linkages, these findings resonate with current thinking in public health and other policy sectors, such as transport and sustainable consumption, on how to achieve change in practice. Within the climate change arena there is now recognition that interventions need to be co-ordinated across systems and to move away from "single action" approaches to

³³ Watson M, Meah A (2013) Food, waste and safety: negotiating conflicting social anxieties into the practices of domestic provisioning. *The Sociological Review*. 60 S2: 102-120

³⁴ Evans D (2012) Beyond the throwaway society: ordinary domestic practices and a sociological approach to household food waste. *Sociology*. 46(1): 41-56

³⁵ Holm L (2013) Sociology of food consumption. Chapter in Murcott A et al. (eds) *The Handbook of Food Research*. Bloomsbury: London

³⁶ US Department of Agriculture & US Department of Health and Human Services [USDA & USDHHS] (2010) *Dietary guidelines for Americans, 2010, 7th Edition*. US Government Printing Office: Washington DC

achieve effective changes in practices and also avoid interventions that pull consumers in different directions.³⁷

7.5 Implications for Food and You

To further develop this work:

- Future waves of Food and You could continue in the case of Scotland and Northern Ireland to include nutrition questions to allow further examination of the linkages between food and nutrition practices; this could include re-establishment of nutrition questions for the England and Wales sample
- Collecting longitudinal data could be considered. This would allow a more robust examination of causality. For example, does better health/nutrition knowledge lead to better food safety practices or the other way round? Do people actively seek information on food safety and then find advice on healthy eating or do they seek information on healthy eating first?
- Questions that ask about where people look for healthy eating advice could be included in future waves of Food and You (alongside the current questions about where people look for information on food safety) to explore the efficacy of targeting messages together.

³⁷ Southerton D, McKeekin A, Evans D (2011) International Review of Behaviour Change Practices: Climate Change Behaviours Research Programme. Scottish Government Social Research: Edinburgh



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.

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
<i>Weighted base</i>	<i>6378</i>	<i>100</i>	
<i>Unweighted base</i>	<i>6379</i>		

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?	<ul style="list-style-type: none"> -Yes - Someone else in the household does - I don't need to – it has an alarm 	<ul style="list-style-type: none"> - No - Don't know 	- N/A	<p>1 = RP responses to all questions</p> <p>0 = Non-RP responses to 1 or more questions</p> <p>NA = NA to Q4.9</p>
	Q4.10 How often do you or another person in your household check the temperature of the fridge?	<ul style="list-style-type: none"> - 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 <p><i>If respondent said 'I don't need to – it has an alarm' in Q4.9, then coded RP in Q4.10</i></p>	<ul style="list-style-type: none"> - Four times a year - 1-2 times a year - Never - Don't know/ Can't remember 	<ul style="list-style-type: none"> - 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? (<i>multicode</i>)	<p>AT LEAST ONE OF:</p> <ul style="list-style-type: none"> - Check the temperature display /thermometer built into fridge' - Put a thermometer into the fridge and check <p><i>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</i></p>	<p>ZERO RP RESPONSES AND AT LEAST ONE OF:</p> <ul style="list-style-type: none"> - 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 - Don't know 	<ul style="list-style-type: none"> - If respondents said 'No' in Q4.9 - N/A 	

	Q4.12 What do you think the temperature inside your fridge should be?	- 0-5°C	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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?	<ul style="list-style-type: none"> - Not at all - Once 	<ul style="list-style-type: none"> - 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? <i>(multicode)</i>	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? <i>(multicode)</i>	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

	Q4.15 How do you store raw meat and poultry in the fridge? (<i>multicode</i>)	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	NA = NA response to one or both questions
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 response to both questions
	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	
Knowledge and checking of use by dates	Q4.19 Which of these indicates whether food is safe to eat? (<i>multicode</i>)	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



	Q22 Do you check use by dates when you are about to cook or prepare food?	<ul style="list-style-type: none">- Always- Depending on food type	<ul style="list-style-type: none">- Sometimes- Never- Don't know	- N/A	NA = NA response to one or both questions
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?	<ul style="list-style-type: none">- The same day- Monday- Tuesday- Never have leftovers	<ul style="list-style-type: none">- Wednesday- Thursday- Friday- Saturday- Sunday- More than a week- Don't know	- N/A	-

Appendix B. Social and economic factors included in the regression models

The following factors were entered into all the regression models presented in the appendices.

Table B1 Social and economic factors included in the regression models				
Factor	Category	n	%	Mean IRP score
Gender*	Male	3120	49	63
	Female	3274	51	68
Age*	16-34	2024	32	65
	35-64	3100	49	67
	65+	1265	20	64
UK Country	England and Wales (Ref.)	5672	89	65
	Scotland	543	9	66
	Northern Ireland	179	3	68
Household size (including children)	1 (Ref.)	1052	17	63
	2	2381	37	66
	3+	2961	46	66
Children in household	Yes (Ref.)	1646	26	67
	No	4748	74	65
Highest education level achieved	Degree or higher (Ref.)	1547	24	65
	A level /Diploma/Apprentice	2085	33	66
	GCSE	1397	22	67
	Other/None	1330	21	65
Housing tenure	Owner occupied (Ref.)	4044	65	66
	Other	2166	35	65
Income level	Up to £10,399 (Ref.)	727	11	65
	£10,400 to £25,999	1533	24	66
	£26,000 to £51,999	1439	23	66
	£52,000+	1129	18	67
	Missing	1566	25	64
Socio-economic classification	Managerial/Professional (Ref.)	2260	35	66
	Intermediate	1140	18	65
	Routine/Manual	2214	35	66
	Not classifiable/Never worked	779	12	64

Marital status	Married/Living as married (Ref.)	3457	54	67
	Single/Widowed/Divorced	2932	46	64
Ethnicity	White	5592	89	66
	BME/Other	668	11	61
Work status	In work (Ref.)	3438	54	67
	Retired	1410	22	65
	Unemployed	387	6	63
	Other	1158	18	65
Religion	Christian (Ref.)	4147	65	66
	Non-Christian	503	8	62
	No religion	1712	27	66
Self-reported general	Good/Very good (Ref.)	4841	76	66
	Fair	1274	20	65
	Bad/Very bad	278	4	63
Disability/Long-lasting illness	Yes (Ref.)	1099	17	64
	No	5295	83	66
Urbanity	Urban (Ref.)	5545	87	65
	Rural	849	13	66
Index of Multiple Deprivation	1 (most deprived) (Ref.)	1250	20	66
	2	1307	20	66
	3	1306	20	67
	4	1247	20	65
	5 (least deprived)	1285	20	64
Survey wave[†]	Wave 1	3163	50	65
	Wave 2	3231	51	66

**Age and gender are entered combined in the regression model as 6 groups with males 16-34 as the reference group.*

[†] Survey wave has not been included in every regression model – where it has been included is indicated at the bottom of the model

Appendix C. Domestic food safety practices and nutrition-related behaviours

C.1 Eating habits

Table C1 Ate 5 or more portions of fruit and vegetables yesterday

Base: All respondents 2010 and Scotland/NI respondents 2012		
Achieved 5-a-day	%	Mean IRP score
No	53	65
Yes	47	66
<i>Bases unweighted</i>	4119	
<i>Bases weighted</i>	3454	

Table C2 Vegetarian

Base: All respondents 2010 and 2012		
Vegetarian/Vegan	%	Mean IRP score
No	94	65
Yes	6	67
<i>Bases unweighted</i>	6394	
<i>Bases weighted</i>	6394	

Table C3 Eating 5 or more portions of fruit and vegetables yesterday by whether vegetarian

Base: All respondents 2010 and Scotland/NI respondents 2012		Vegetarian/Vegan	
		No	Yes
		%	%
Achieved 5-a-day	No	53	44
	Yes*	47	56
<i>Bases unweighted</i>		3889	227
<i>Bases weighted</i>		3224	229

* Significant at the 5% level.

Table C4 Eating 5 or more portions of fruit and vegetables yesterday by whether has food allergy

Base: All respondents 2010 and Scotland/NI respondents 2012		Food allergy	
		No	Yes
		%	%
Achieved 5-a-day	No	53	45
	Yes*	47	55
<i>Bases unweighted</i>		3884	232
<i>Bases weighted</i>		3255	198

* Significant at the 5% level.

Table C5 Categorised IRP score by eating 5 portions of fruit and vegetables yesterday

IRP Score (out of 100)	Achieved 5-a-day	
	Yes	No
	%	%
0-10	0	0
11-20	1	0
21-30	2	2
31-40	6	6
41-50	11	13
51-60	19	20
61-70	32	27
71-80	22	22
81-90	7	7
91-100	1	1
<i>Bases unweighted</i>	1639	1810
<i>Bases weighted</i>	1923	2187

C.2 IRP score by nutrition-related behaviours

In all the regression tables below, we have shown the results relevant to the predictor variable of interest. Each model also includes all the social and economic factors in Table B1, but these are not shown. Where the factor significantly predicts IRP score (has a p value of less than 0.05) this is indicated with an asterisk, although the precise p value is not stated. A statistically significant factor means the outcome of the model (IRP score) varies with that factor. If the factor is significant we can then look at the p-values for the categories within each factor, if these are less than 0.05 then the category is significantly different from the reference category.

Table C6 Multiple linear regression: overall IRP score and achieved 5-a-day

Base: All respondents 2010 and Scotland/NI respondents 2012					
Factor	Category	Coeff	95% CI		P
			Lower	Upper	
Achieved 5-a-day	No (Ref.)	0.0			0.224
	Yes	0.8	-0.5	2.0	
<i>Bases unweighted</i>		4005			
<i>Bases weighted</i>		3355			

Model also includes the social and economic factors (including survey wave) listed in Table B1.

Table C7 Multiple linear regression: overall IRP score and vegetarian/vegan

Base: 2010 and 2012					
Factor	Category	Coeff	95% CI		P
			Lower	Upper	
Vegetarian/Vegan	No (Ref.)	0.0			0.337
	Yes	1.1	-1.2	3.4	
<i>Bases unweighted</i>		6062			
<i>Bases weighted</i>		5978			

Model also includes the social and economic factors listed in Table B1.



Appendix D. Domestic food safety practices and shopping and cooking

In all the regression tables below, we have shown the results relevant to the predictor variable of interest. Each model also includes all the social and economic factors in Table B1, but these are not shown. Where the factor significantly predicts IRP score (has a p value of less than 0.05) this is indicated with an asterisk, although the precise p value is not stated. A statistically significant factor means the outcome of the model (IRP score) varies with that factor. If the factor is significant we can then look at the p-values for the categories within each factor, if these are less than 0.05 then the category is significantly different from the reference category

Table D1 Frequency of main food shop

Base: Third of respondents 2010 and all respondents 2012		
Frequency of shopping	%	Mean IRP score
More than once a week	22	64
About once a week	58	67
2-3 times a month	11	66
Once a month or less	8	65
<i>Bases unweighted</i>	4265	
<i>Bases weighted</i>	4225	

Table D2 Multiple linear regression: overall IRP score and frequency of main food shop

Base: Third of respondents 2010 and all respondents 2012					
Factor	Category	Coeff	95% CI		P
			Lower	Upper	
Frequency of shop	More than once a week (Ref.)	0.0			
	About once a week	1.2	-0.3	2.6	0.111
	2-3 times a month	0.4	-1.8	2.5	0.741
	Once a month or less	-0.1	-2.5	2.4	0.964
<i>Bases unweighted</i>		4002			
<i>Bases weighted</i>		3896			

Model also includes the social and economic factors listed in Table B1.

Table D3 Multiple logistic regression: predictors of following recommended practice (use-by dates) and frequency of main food shop

Base: Third of respondents 2010 and all respondents 2012

Outcome: Check use-by dates when preparing to cook

Factor	Category	OR	95% CI		P
			Lower	Upper	
Frequency of shop	More than once a week (Ref.)	1			
	About once a week	0.994	0.764	1.293	0.963
	2-3 times a month	0.713	0.504	1.008	0.056
	Once a month or less	0.836	0.570	1.226	0.358
<i>Bases unweighted</i>		4264			
<i>Bases weighted</i>		4225			

Model also includes the social and economic factors listed in Table B1.

Table D4 Multiple logistic regression: predictors of following recommended practice (leftovers) and frequency of main food shop

Base: Third of respondents 2010 and all respondents 2012

Outcome: Last day use leftovers is in line with recommended practice

Factor	Category	OR	95% CI		P
			Lower	Upper	
Frequency of shop	More than once a week (Ref.)	1			
	About once a week	1.087	0.807	1.465	0.583
	2-3 times a month	0.761	0.510	1.134	0.179
	Once a month or less	0.723	0.467	1.119	0.146
<i>Bases unweighted</i>		4006			
<i>Bases weighted</i>		3900			

Model also includes the social and economic factors listed in Table B1.

Table D5 Multiple logistic regression: predictors of following recommended practice (keeping high risk foods – sliced/cured meat) and frequency of main food shop

Base: All respondents 2012

Outcome: Keep high risk foods (sliced/cured meat) in line with recommended practice

Factor	Category	OR	95% CI		P
			Lower	Upper	
Frequency of shop	More than once a week (Ref.)	1			
	About once a week	1.109	0.847	1.451	0.453
	2-3 times a month	1.103	0.758	1.604	0.609
	Once a month or less	0.967	0.626	1.494	0.879
<i>Bases unweighted</i>		2739			
<i>Bases weighted</i>		2670			

Model also includes the social and economic factors listed in Table B1.

Table D6 Multiple logistic regression: predictors of following recommended practice (keeping high risk foods – meat pate) and frequency of main food shop

Base: All respondents 2012

Outcome: Keep high risk foods (pate) in line with recommended practice

Factor	Category	OR	95% CI		P
			Lower	Upper	
Frequency of shop	More than once a week (Ref.)	1			
	About once a week	1.089	0.833	1.424	0.532
	2-3 times a month	0.998	0.686	1.451	0.992
	Once a month or less	1.040	0.688	1.572	0.852
<i>Bases unweighted</i>		2345			
<i>Bases weighted</i>		2381			

Model also includes the social and economic factors listed in Table B1.

Table D7 Multiple logistic regression: predictors of following recommended practice (keeping high risk foods – fresh dip) and frequency of main food shop

Base: All respondents 2012

Outcome: Keep high risk foods (fresh dip) in line with recommended practice

Factor	Category	OR	95% CI		P
			Lower	Upper	
Frequency of shop	More than once a week (Ref.)	1			
	About once a week	0.947	0.721	1.244	0.694
	2-3 times a month	0.875	0.594	1.289	0.498
	Once a month or less	0.980	0.645	1.491	0.926
<i>Bases unweighted</i>		2269			
<i>Bases weighted</i>		2381			

Model also includes the social and economic factors listed in Table B1.

Table D8 Multiple logistic regression: predictors of following recommended practice (keeping high risk foods – fish) and frequency of main food shop

Base: All respondents 2012

Outcome: Keep high risk foods (fish) in line with recommended practice

Factor	Category	OR	95% CI		P
			Lower	Upper	
Frequency of shop	More than once a week (Ref.)	1			
	About once a week	1.007	0.757	1.340	0.960
	2-3 times a month	1.095	0.728	1.646	0.663
	Once a month or less	0.807	0.521	1.252	0.339
<i>Bases unweighted</i>		2084			
<i>Bases weighted</i>		2140			

Model also includes the social and economic factors listed in Table B1.

Table D9 Multiple logistic regression: predictors of following recommended practice (keeping high risk foods – soft cheese) and frequency of main food shop

Base: All respondents 2012

Outcome: Keep high risk foods (soft cheese) in line with recommended practice

Factor	Category	OR	95% CI		P
			Lower	Upper	
Frequency of shop	More than once a week (Ref.)	1			
	About once a week	1.062	0.781	1.443	0.702
	2-3 times a month	0.941	0.620	1.429	0.775
	Once a month or less	0.976	0.614	1.553	0.919
<i>Bases unweighted</i>		2392			
<i>Bases weighted</i>		2461			

Model also includes the social and economic factors listed in Table B1.

Table D10 Frequency of cooking for self and for others

Base: 2010 and 2012

	Frequency of cooking			
	For self		For others	
	%	Mean IRP score	%	Mean IRP score
At least once a day	59	66	38	68
3-6 times a week	19	65	18	66
2-8 times a month	13	63	20	64
Once a month or less	9	64	25	62
<i>Bases unweighted</i>	6394		6394	
<i>Bases weighted</i>	6394		6394	

Table D11 Multiple linear regression: overall IRP score and frequency of cooking for self

Base: 2010 and 2012					
Factor	Category	Coeff	95% CI		P
			Lower	Upper	
Cook for self	Once a month or less (Ref.)	0.0			
	2-8 times a month	0.3	-2.0	2.7	0.775
	3-6 times a week	1.5	-0.6	3.7	0.156
	At least once a day	1.9	-0.1	3.9	0.057
<i>Bases unweighted</i>		6379			
<i>Bases weighted</i>		6377			

Model also includes the social and economic factors (including survey wave) listed in Table B1.

Table D12 Multiple linear regression: overall IRP score and frequency of cooking for others

Base: 2010 and 2012					
Factor	Category	Coeff	95% CI		P
			Lower	Upper	
Cook for others*	Once a month or less (Ref.)	0.0			
	2-8 times a month	1.2	-0.4	2.8	0.149
	3-6 times a week	2.5	0.9	4.2	0.003
	At least once a day	3.3	1.8	4.9	0.000
<i>Bases unweighted</i>		6083			
<i>Bases weighted</i>		6006			

* Factor is significant at the 5% level.

Model also includes the social and economic factors (including survey wave) listed in Table B1.

Appendix E. Knowledge of healthy eating recommendations and nutrition-related behaviours

In all the regression tables below, we have shown the results relevant to the predictor variable of interest. Each model also includes all the social and economic factors in Table B1, but these are not shown. Where the factor significantly predicts IRP score (has a p value of less than 0.05) this is indicated with an asterisk, although the precise p value is not stated. A statistically significant factor means the outcome of the model (IRP score) varies with that factor. If the factor is significant we can then look at the p-values for the categories within each factor, if these are less than 0.05 then the category is significantly different from the reference category.

Table E1 Foods in correct proportions on the eatwell plate

Base: All respondents 2010 and Scotland/NI respondents 2012		
Number of foods in correct proportions on the plate	%	Mean IRP score
Three or more	85	70
Two or less	15	66
<i>Bases unweighted</i>	4174	
<i>Bases weighted</i>	3528	

Table E2 Multiple linear regression: overall IRP score and knowledge of eatwell plate

Base: All respondents 2010 and Scotland/NI respondents 2012					
Factor	Category	Coeff	95% CI		P
			Lower	Upper	
Number of correct proportions on the plate*	Three of more (Ref.)	0.0			
	Two or less	-2.8	-4.8	-0.7	0.008
<i>Bases unweighted</i>		4054			
<i>Bases weighted</i>		3424			

* Factor is significant at the 5% level.

Model also includes the social and economic factors (including survey wave) listed in Table B1.

Table E3 Predicted IRP score by gender and knowledge of eatwell plate

Gender	Knowledge of eatwell plate	Predicted IRP score (out of 100)
Men	Three or more	64.0
	Two or less	60.1
Women	Three or more	68.5
	Two or less	64.8

Table E4 Predicted IRP score by age and knowledge of eatwell plate

Age	Knowledge of eatwell plate	Predicted IRP score (out of 100)
16 -34	Three or more	66.9
	Two or less	62.5
35 - 64	Three or more	67.5
	Two or less	63.6
65+	Three or more	65.0
	Two or less	61.5

Table E5 Predicted IRP score by country and knowledge of eatwell plate

Country	Knowledge of eatwell plate	Predicted IRP score (out of 100)
England and Wales	Three or more	65.8
	Two or less	61.4
Scotland	Three or more	67.1
	Two or less	63.1
Northern Ireland	Three or more	68.5
	Two or less	64.8

Table E6 Recommended number of portions of fruit and vegetables

Base: All respondents 2010 and Scotland/NI respondents 2012		
Recommended portions of F&V	%	Mean IRP score
Less than 5	14	60
5 or more	86	66
<i>Bases unweighted</i>	4174	
<i>Bases weighted</i>	3528	

Table E7 Eating 5 portions of fruit and vegetables yesterday by knowledge of recommended number of portions of fruit and vegetables

Base: All respondents 2010 and Scotland/NI respondents 2012		
	Recommended portions of F&V	
	Less than 5	5 or more
Achieved 5-a-day	%	%
No	65	51
Yes	34	49
<i>Bases unweighted</i>	558	3561
<i>Bases weighted</i>	463	2992

Table E8 Multiple linear regression: overall IRP score and knowledge of recommended number of portions of fruit and vegetables

Base: All respondents 2010 and Scotland/NI respondents 2012					
Factor	Category	Coeff	95% CI		P
			Lower	Upper	
Recommended number of portions of fruit and vegetables*	Less than 5 (Ref.)	0.0			
	5 or more	3.3	1.4	5.3	0.001
<i>Bases unweighted</i>		4054			
<i>Bases weighted</i>		3424			

* Factor is significant at the 5% level.

Model also includes the social and economic factors (including survey wave) listed in Table B1.

Table E9 Predicted IRP score by gender and knowledge of recommended portions of fruit and vegetables

Gender	Knowledge of eatwell plate	Predicted IRP score (out of 100)
Men	5 or more	64.2
	Less than 5	59.8
Women	5 or more	68.5
	Less than 5	63.7

Table E10 Predicted IRP score by age and knowledge of recommended portions of fruit and vegetables

Age	Knowledge of eatwell plate	Predicted IRP score (out of 100)
16 -34	5 or more	67.0
	Less than 5	62.6
35 - 64	5 or more	67.6
	Less than 5	62.0
65+	5 or more	65.2
	Less than 5	60.7

Table E11 Predicted IRP score by country and knowledge of recommended portions of fruit and vegetables

Country	Knowledge of eatwell plate	Predicted IRP score (out of 100)
England and Wales	5 or more	66.0
	Less than 5	60.4
Scotland	5 or more	67.0
	Less than 5	62.0
Northern Ireland	5 or more	68.8
	Less than 5	63.8

Table E12 Recommended maximum daily salt intake		
Base: All respondents 2010 and Scotland/NI respondents 2012		
Recommended maximum daily intake of salt	%	Mean IRP score
Less than 6g	56	67
6g (Recommended maximum)	16	66
More than 6g	28	65
<i>Bases unweighted</i>	2282	
<i>Bases weighted</i>	2064	

Table E13 Multiple linear regression: overall IRP score and knowledge of recommended maximum daily salt intake					
Base: All respondents 2010 and Scotland/NI respondents 2012					
Factor	Category	Coeff	95% CI		P
			Lower	Upper	
Recommended maximum daily intake of salt	6g (Ref.)	0.0			
	Less than 6g	1.8	-0.3	3.8	0.094
	More than 6g	-0.2	-2.6	2.3	0.886
<i>Bases unweighted</i>		2231			
<i>Bases weighted</i>		2007			

Model also includes the social and economic factors listed in Table B1.

Table E14 Knowledge of recommended daily calorie intake				
Base: All respondents 2010 and Scotland/NI respondents 2012				
	Men	Women	Total	
Recommended number of calories for women	%	%	%	Mean IRP score
Less than 2000 calories	55	49	52	66
2000 calories (Recommended allowance)	34	45	40	68
More than 2000 calories	10	6	8	64
<i>Bases unweighted</i>	988	1770	2758	
<i>Bases weighted</i>	1087	1322	2409	
Recommended number of calories for men				
Less than 2500 calories	47	43	45	66
2500 calories (Recommended allowance)	39	40	39	68
More than 2500 calories	14	18	16	65
<i>Bases unweighted</i>	1006	1727	2733	
<i>Bases weighted</i>	1105	1310	2415	

Table E15 Multiple linear regression: overall IRP score and knowledge of recommended number of calories for women

Base: All respondents 2010 and Scotland/NI respondents 2012

Factor	Category	Coeff	95% CI		P
			Lower	Upper	
Recommended number of calories for women	2000 (Ref.)	0.0			
	Less than 2000	-1.3	-2.4	0.6	0.237
	More than 2000	-3.3	-6.4	-0.2	0.036
<i>Bases unweighted</i>		2696			
<i>Bases weighted</i>		2348			

Model also includes the social and economic factors listed in Table B1.

Table E16 Multiple linear regression: overall IRP score and knowledge of recommended number of calories for men

Base: All respondents 2010 and Scotland/NI respondents 2012

Factor	Category	Coeff	95% CI		P
			Lower	Upper	
Recommended number of calories for men*	2500 (Ref.)	0.0			
	Less than 2500	-1.5	-3.1	0.1	0.073
	More than 2500	-2.4	-4.5	-0.3	0.022
<i>Bases unweighted</i>		2673			
<i>Bases weighted</i>		2356			

* Factor is significant at the 5% level.

Model also includes the social and economic factors listed in Table B1.

Appendix F. Attitudes towards healthy eating

In all the regression tables below, we have shown the results relevant to the predictor variable of interest. Each model also includes all the social and economic factors in Table B5, but these are not shown. Where the factor significantly predicts IRP score (has a p value of less than 0.05) this is indicated with an asterisk, although the precise p value is not stated. A statistically significant factor means the outcome of the model (IRP score) varies with that factor. If the factor is significant we can then look at the p-values for the categories within each factor, if these are less than 0.05 then the category is significantly different from the reference category.

Table F1 Perception of diet

Base: All respondents 2010 and Scotland/NI respondents 2012		
Perception of diet	%	Mean IRP score
Very or fairly healthy	84	66
Neither healthy nor unhealthy	11	63
Very or fairly unhealthy	5	61
<i>Bases unweighted</i>	4174	
<i>Bases weighted</i>	3528	

Table F2 Eating 5 or more portions of fruit and vegetables yesterday by perception of diet

Base: All respondents 2010 and Scotland/NI respondents 2012			
	Perception of diet		
	Healthy	Neither	Unhealthy
Achieved 5-a-day	%	%	%
No	53	76	81
Yes*	47	24	19
<i>Bases unweighted</i>	3461	440	218
<i>Bases weighted</i>	2849	394	213

* Significant trend at the 5% level.

Table F3 Dietary change

Base: All respondents 2010 and Scotland/NI respondents 2012		
Do not need to change diet	%	Mean IRP score
Definitely agree	21	65
Tend to agree	34	66
Neither agree nor disagree	12	63
Tend to disagree	26	65
Definitely disagree	7	65
<i>Bases unweighted</i>	4169	
<i>Bases weighted</i>	3528	

Table F4 Eating 5 or more portions of fruit and vegetables yesterday by dietary change

Base: All respondents 2010 and Scotland/NI respondents 2012

	'I do not need to make any changes to the food I eat because it is already healthy enough'		
	Agree	Neither agree nor disagree	Disagree
Achieved 5-a-day	%	%	%
No	44	60	64
Yes*	56	40	36
<i>Bases unweighted</i>	2269	408	1438
<i>Bases weighted</i>	1897	399	1155

* Significant trend at the 5% level.

Table F5 Knowledge of recommended number of portions of fruit and vegetables by dietary change

Base: All respondents 2010 and Scotland/NI respondents 2012

	'I do not need to make any changes to the food I eat because it is already healthy enough'		
	Agree	Neither agree nor disagree	Disagree
Recommended number of portions of fruit and vegetables	%	%	%
Less than 5	16	12	11
5 or more*	84	88	89
<i>Bases unweighted</i>	2297	423	1449
<i>Bases weighted</i>	1938	416	1170

* Significant trend at the 5% level.

Table F6 Knowledge of eatwell plate by dietary change

Base: All respondents 2010 and Scotland/NI respondents 2012

	'I do not need to make any changes to the food I eat because it is already healthy enough'		
	Agree	Neither agree nor disagree	Disagree
Number of correct proportions on the plate	%	%	%
Three or more*	81	87	91
Two or less	19	14	9
<i>Bases unweighted</i>	2297	423	1449
<i>Bases weighted</i>	1938	416	1171

* Significant at the 5% level.

Table F7 Multiple linear regression: overall IRP score and perception of diet

Base: All respondents 2010 and Scotland/NI respondents 2012

Factor	Category	Coeff	95% CI		P
			Lower	Upper	
Perception of diet*	Healthy (Ref.)	0.0			
	Neither healthy nor unhealthy	-1.9	-3.8	-0.0	0.052
	Unhealthy	-4.0	-7.2	-0.9	0.013
<i>Bases unweighted</i>		4054			
<i>Bases weighted</i>		3424			

* Factor is significant at the 5% level.

Model also includes the social and economic factors (including survey wave) listed in Table B1.

Table F8 Multiple linear regression: overall IRP score and "I do not need to make any changes to the food I eat because it is healthy enough"

Base: All respondents 2010 and Scotland/NI respondents 2012

Factor	Category	Coeff	95% CI		P
			Lower	Upper	
"I do not need to make any changes to the food I eat because it is already healthy enough"	Agree (Ref.)	0.0			
	Neither agree nor disagree	-2.3	-4.3	-0.2	0.029
	Disagree	-0.6	-2.0	0.7	0.367
<i>Bases unweighted</i>		4054			
<i>Bases weighted</i>		3424			

Model also includes the social and economic factors listed in Table B1.

Table F9 Multiple linear regression: overall IRP score and “If you are not overweight you can eat whatever you like”

Base: All respondents 2010 and Scotland/NI respondents 2012

Factor	Category	Coeff	95% CI		P
			Lower	Upper	
“If you are not overweight you can eat whatever you like”*	Agree (Ref.)	0.0			
	Neither agree nor disagree	-1.0	-4.1	2.3	0.539
	Disagree	2.3	0.6	3.9	0.008
<i>Bases unweighted</i>		4054			
<i>Bases weighted</i>		3424			

* Factor is significant at the 5% level.

Model also includes the social and economic factors listed in Table B1.

Table F10 Multiple linear regression: overall IRP score and “As long as you take enough exercise you can eat whatever you want”

Base: All respondents 2010 and Scotland/NI respondents 2012

Factor	Category	Coeff	95% CI		P
			Lower	Upper	
“As long as you take enough exercise you can eat whatever you want”	Agree (Ref.)	0.0			
	Neither agree nor disagree	-0.9	-3.3	1.6	0.490
	Disagree	0.7	-0.7	2.3	0.320
<i>Bases unweighted</i>		4054			
<i>Bases weighted</i>		3424			

Model also includes the social and economic factors listed in Table B1.

Appendix G. Eating outside the home

Table G1 Perceptions of how healthy food is outside the home

Base: Third of respondents 2010 and Scotland/NI respondents 2012	
Eating out vs. eating in	%
More healthy	7
About the same	35
Less healthy	58
<i>Bases unweighted</i>	1988
<i>Bases weighted</i>	1366

Table G2 Perceptions of how healthy food is outside the home and healthy eating options

Base: Third of respondents 2010 and Scotland/NI respondents 2012				
	Eating out vs. eating in			
	More healthy	About the same	Less healthy	Total
Would like more information on healthy eating options	%	%	%	%
Yes*	79	70	80	77
No	21	30	20	23
<i>Bases unweighted</i>	120	728	1140	1988
<i>Bases weighted</i>	96	474	796	1366

* Significant trend at the 5% level.

Table G3 Perceptions of how healthy food is outside the home and valuing a good food hygiene rating

Base: Third of respondents 2010 and Scotland/NI respondents 2012			
	Eating out vs. eating in		
	More healthy	About the same	Less healthy
Value a good hygiene rating	%	%	%
No	69	74	76
Yes	31	26	24
<i>Bases unweighted</i>	120	728	1140
<i>Bases weighted</i>	96	474	796

Table G4 Healthy eating options and valuing a good food hygiene rating

Base: Third of respondents 2010 and Scotland/NI respondents 2012

	Would like more information on healthy eating options	Would not like more information on healthy eating options	Total
Value a good hygiene rating	%	%	%
No	72	84	75
Yes*	28	16	25
<i>Bases unweighted</i>	1526	468	1994
<i>Bases weighted</i>	1046	326	1372

* Significant trend at the 5% level.

Table G5 Knowledge of eatwell plate and valuing a good food hygiene rating

Base: All respondents 2010 and Scotland/NI respondents 2012

	Number of correct proportions on the plate	
	Three or more	Two or less
Value a good hygiene rating	%	%
No	75	81
Yes	25	19
<i>Bases unweighted</i>	1747	320
<i>Bases weighted</i>	1222	220

Table G6 Knowledge of recommended number of portions of fruit and vegetables and valuing a good food hygiene rating

Base: All respondents 2010 and Scotland/NI respondents 2012

	Recommended number of portions of fruit and vegetables	
	Less than 5	5 or more
Value a good hygiene rating	%	%
No	79	76
Yes	21	24
<i>Bases unweighted</i>	263	1804
<i>Bases weighted</i>	173	1269

Table G7 Perceptions of how healthy food is outside the home and using a good food hygiene rating scheme

Base: Scotland/NI respondents 2012			
	Eating out vs. eating in		
	More healthy	About the same	Less healthy
Used a food hygiene rating scheme in last 12 months	%	%	%
No	89	90	88
Yes	11	10	12
<i>Bases unweighted</i>	52	368	586
<i>Bases weighted</i>	18	136	209

Table G8 Healthy eating options and using a good food hygiene rating scheme

Base: Scotland/NI respondents 2012			
	Would like more information on healthy eating options	Would not like more information on healthy eating options	Total
Used a food hygiene rating scheme in last 12 months	%	%	%
No	86	96	89
Yes*	14	4	11
<i>Bases unweighted</i>	775	236	1011
<i>Bases weighted</i>	279	86	365

* Significant trend at the 5% level.

Table G9 Knowledge of eatwell plate and using a good food hygiene rating scheme

Base: Scotland/NI respondents 2012		
	Number of correct proportions on the plate	
	Three or more	Two or less
Used a food hygiene rating scheme in last 12 months	%	%
No	89	86
Yes	11	14
<i>Bases unweighted</i>	852	159
<i>Bases weighted</i>	306	59

Table G10 Knowledge of recommended number of portions of fruit and vegetables and using a good food hygiene rating scheme

Base: Scotland/NI respondents 2012

	Recommended number of portions of fruit and vegetables	
	Less than 5	5 or more
Used a food hygiene rating scheme in last 12 months	%	%
Yes	10	12
No	90	88
<i>Bases unweighted</i>	110	901
<i>Bases weighted</i>	39	326

Appendix H. Questions from Food and You surveys used in the analyses in this report

H.1 Fruit and vegetable consumption

Thinking just about YESTERDAY can you tell me how many portions of vegetables – including salad, fresh, frozen or tinned vegetables you ate?

NOTE: A portion is 80g, which is 3 heaped tablespoons of cooked vegetables or a handful of cherry tomatoes or a small bowl of salad. It does not include potatoes.

WRITE IN

RANGE 0-15 – SOFT CHECK IF SAY MORE THAN 15?

Don't Know

Can I just check you are thinking of 80g portions, rather than individual items?

Thinking just about YESTERDAY did you have a portion of fruit juice (pure juice / 100% freshly squeezed/ fruit smoothies/ juice from concentrate BUT NOT juice based drinks such as squash)

NOTE: A portion is a medium sized glass (150 ml)

Yes

No

Don't Know

Thinking just about YESTERDAY can you tell me how many portions of fruit - fresh, frozen, tinned or dried you ate?

NOTE: A portion is 80g, which is for example, a medium sized piece of fruit such as an apple or a banana, or two small pieces of fruit such as satsumas or plums, a handful of grapes, 1 tablespoon of dried fruit

WRITE IN

Don't know CODE NOT SHOWN

RANGE 0-15 – SOFT CHECK IF SAY MORE THAN 15?

Can I just check you are thinking of 80g portions, rather than individual items?

H.2 Question on vegetarianism/food allergies

Which, if any, of the following applies to you? Please state all that apply.

RANDOMISE ORDER, BUT ALWAYS KEEP VEGETARIAN STATEMENTS TOGETHER.

MULTICODE

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

H.3 Question on shopping

How often do you do a main shop for your household food shopping?

INTERVIEWER: IF RESPONDENT SAYS „DON'T DO A MAIN SHOP“, CODE AS „NEVER“

SHOW SCREEN
Every day
2-3 times per week
About once a week
2-3 times a month
Once a month
Less often
Never
Don't Know

H.4 Question on cooking

How often do you cook or prepare food for yourself?

SINGLE CODE
At least once a day
5-6 times a week
3-4 times a week
Once or twice a week
Once a fortnight
Once a month
Less than once a month
Never
It varies too much to say

How often do you cook or prepare food for others?

SINGLE CODE
At least once a day
5-6 times a week
3-4 times a week
Once or twice a week
Once a fortnight
Once a month
Less than once a month
Never
It varies too much to say

H.5 Question on eatwell plate

It is recommended that people should eat a balanced diet. A balanced diet is made up of a variety of different types of food:

RANDOMISE ORDER OF CATEGORIES

Bread, rice, potatoes, pasta and other starchy foods

Fruit and vegetables

Meat, fish, eggs, beans and other non-dairy sources of protein

Food and drinks high in fat and/or sugar, and

Milk and dairy foods like yoghurt and cheese.

READ OUT CODES THEN PRESS CONTINUE (NO NEED TO SELECT ANY CODES TO MOVE ON)

SHOW EATWELL PLATE VISUAL – SHOWCARD C

READ OUT

This card shows a plate, divided into 5 sections. The sections represent the proportions that the different food groups should make towards the whole of a recommended balanced diet.

INTERVIEWER: PLEASE SHUFFLE CARDS BETWEEN INTERVIEWS TO RANDOMISE ORDER

INTERVIEWER: HAND OVER SHUFFLE CARDS

READ OUT

These cards show the different food groups (*small cards with food groups written on*).

Thinking of all the food a person would eat in a day, please place each card on the plate, to show how much of this food group you think there should be in a recommended balanced diet.

NOTE: we are focusing on all food eaten over the course of the day rather than in one meal

INTERVIEWER – RECORD FOOD TYPE FOR EACH SECTION

RESPONSES FOR EACH OF THE 5 FOOD TYPES

Bread, rice, potatoes, pasta, starchy foods

Fruit and vegetables

Meat, fish, eggs, beans, non-dairy sources of protein

Food and drinks high in fat and/or sugar

Milk and dairy foods

Section A

Section B

Section C

Section D

Section E

Don't know

H.6 Question on recommended portions of fruit and vegetables

How many portions of fruit and vegetables do you think that health experts recommend people should eat every day?

WRITE IN

Don't know

H.7 Question on recommended maximum amount of salt

It is recommended that we should eat no more than a certain amount of salt each day. How much salt do you think this is for adults? Please give your answer in grams if possible.

SPONTANEOUS

SINGLE CODE

CODE CAREFULLY TO THE PRE-CODED LIST.

Up to 0.5g

0.6-1g

1g

2g

3g

4g

5g

6g

7g

8g

9g

10g

11g-15g

16g-20g

More than 20g

Something else (SPECIFY)

Don't know

H.8 Question on recommended number of calories

Health experts make recommendations about the number of calories the average person should eat. Can you tell me what you think is the recommended number of calories average women should eat a day?

SPONTANEOUS

WRITE IN (0 – 9995)

Don't know

Health experts make recommendations about the number of calories the average person should eat. Can you tell me what you think is the recommended number of calories average men should eat a day?

SPONTANEOUS

WRITE IN (0 – 9995)

Don't know

H.9 Perception of healthiness of diet

Overall, in your opinion, would you say that what you usually eat is...

SINGLE CODE

Very healthy

Fairly healthy

Neither healthy nor unhealthy

Fairly unhealthy

Very unhealthy

It varies too much to say

H.10 Dietary change

How much do you agree or disagree with the following statement – I do not need to make any changes to the food I eat, as it is already healthy enough

SINGLE CODE

Definitely agree

Tend to agree

Neither agree nor disagree

Tend to disagree

Definitely disagree

Don't know

H.11 Attitudes to healthy eating

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

SCALE

Definitely agree

Tend to agree

Neither agree nor disagree

Tend to disagree

Definitely disagree

Don't know

RANDOMISE LIST

The tastiest foods are the ones that are bad for you

I get confused over what's supposed to be healthy and what isn't

If you are not overweight you can eat whatever you like

Even if you don't have a really healthy diet, it's worth making small changes such as eating less fat

As long as you take enough exercise you can eat whatever you want

The main reason for people to eat a more healthy diet is to lose weight

H.12 Attitudes to healthy eating

In your opinion, when you eat out, how healthy would you say the food that you eat is, compared to when you eat at home?

SINGLE CODE

- A lot more healthy when I eat out
- A bit more healthy when I eat out
- About the same
- A bit less healthy when I eat out
- A lot less healthy when I eat out
- It varies too much to say

H.13 Information on healthy option when eating out

In which, if any, of these places would you like to see more information displayed about how healthy different options are?

MULTICODE

IF RESPONDENT QUERIES: FOR EXAMPLE, INFORMATION SHOWING THE CALORIE CONTENT OF DIFFERENT OPTIONS OR HOW MUCH FAT, SUGAR OR SALT THEY CONTAIN

RANDOMISE ORDER, FIX "NONE" AT THE BOTTOM

- Restaurants
- Pubs
- Cafes, Coffee shops and sandwich shops
- Fast food restaurants e.g. McDonalds, kebab shops
- Workplace canteens
- Food outlets in cinemas, bowling alleys, theme parks or other leisure facilities
- Takeaway outlets e.g. Indian, Chinese, Pizza, fish and chips
- None of these

H.14 Question on important factors when 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

IF CODES 1 – 8 OR 10 GIVEN AT 2.33 DO NOT SHOW "I NEVER EAT OUT AT ALL"
ROTATE REMAINING OPTIONS BUT FIX "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