

Intake24



Field testing of the use of INTAKE24 in a sample of young people and adults living in Scotland

Final report

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1 Executive Summary

Web-based online tools offer the potential to make dietary assessment more convenient, intuitive and engaging for users. They can also ensure consistency of coding and can significantly reduce the cost of nutritional analysis. Repeated 24-hour recalls and food diaries have been shown to provide more accurate and less biased estimates of usual dietary intake than food frequency questionnaires and diet checklists. INTAKE24 measures total energy and nutrient intakes meaning that results can be used to assess progress towards the Scottish Dietary Goals.

INTAKE24 is an online 24-hour dietary recall system based on the Automated Multiple-Pass Method (AMPM). The system was developed by the Newcastle study team for use with 11-24 year-olds in Scottish food and nutrition surveys.

Key features of INTAKE24 include¹:

- Over 2400 photographs of more than 100 foods for portion size estimation.
- An online database of over 2300 foods (including Scottish regional items) linked to the NDNS Nutrient Databank food composition tables.
- Bespoke spelling correction system handling most cases of misspelled food names.
- Contextual questions and associated food prompts which help limit omission of commonly forgotten foods.

Previous tests to examine INTAKE24's relative validity compared with the interviewer-led method were conducted with 11-24 year olds. It was found that:

- Agreement between INTAKE24 and interviewer led recalls was very good with intakes of energy and macronutrients within 1% on average.
- Limits of agreement (within which 95% of estimates lie) for energy ranged from an under-estimate of 48% to an over-estimate of 82% for 11-16 year olds and an underestimate of 50% to an over-estimate of 97% for 17-24 year olds.

This report presents results of a further field test that was conducted between June and August 2015 to examine the feasibility of using INTAKE24 in the wider Scottish population. This was a collaborative project led by Newcastle University (both by researchers in the Human Nutrition Research Centre and in Open Lab) and ScotCen (who worked on the fieldwork area of the project). The aims of the study were to examine the performance of INTAKE24 in the field

¹ INTAKE24 can be tested using the demo site: <https://intake24.co.uk/>

including; attrition rates, snagging issues, and ability to assess progress towards the Dietary Goals for Scotland by age, gender and Scottish Index of Multiple Deprivation (SIMD).

Prior to testing INTAKE24 on the general population the system was further developed to: (i) enable recording of missing/unfound food items; (ii) enable the recording of recipes for composite dishes; (iii) include a video tutorial and context sensitive help; (iv) include a help request system allowing users to email for queries or request telephone help from the study team.

In order to test the system a sample of 1000 people that had previously taken part in the Scottish Health Survey (SHeS) (aged 11 and over) were invited to take part in testing INTAKE24 by ScotCen. The sample was stratified by age, gender and SIMD with over-sampling in sub-sets of the population in which digital technology adoption and frequency of use is known to be low (including older people and those living in the most deprived areas). Of the 1000 people that were selected to take part, 747 people were contacted by telephone. During the telephone call an interviewer explained more about the study (an invitation letter had been sent prior to the telephone call) and invited people to take part. At this stage 71 people were identified as 'ineligible' to take part i.e. they had moved and were no longer contactable using the phone number, they had died, were ill or in hospital or were now physically or mentally unable to take part. Fifty three people were classed as unable to take part (mainly due to lack of internet facilities or competence with computers). Of the remaining sample 239 people refused to take part and 384 people agreed. Those that agreed were asked to complete four x 24-hour recalls using INTAKE24 over a period of ten days, including a combination of weekdays and weekend days, this allowed assessment of the optimum number of recalls a participant should be asked to complete.

The key findings from the fieldwork showed that:

- 57% of people agreed to take part in testing INTAKE24 (where contact was made and they were considered 'eligible').
- 60% of those people that *agreed* completed at least one recall.
- 29% of those people that *agreed* completed the four recalls requested.
- Looking at those *eligible* to take part, only 34% completed at least one recall and 20% completed at least four recalls.
- Recruitment and completion rates varied by age group, SIMD and Body Mass Index (BMI) with older people, those in a higher BMI classification category and those living in the most deprived areas being the least likely to take part in the INTAKE24 field test.

These completion rates were lower than hoped for, however to some extent they are reflective of the recruitment and instruction methods used in this field test. Additional and tailored reminders, a face-to-face interviewer encouraging initial participation, as well as follow up support and reminders for those not logging on/continuing to complete recalls could increase response whilst still remaining cost effective. A key recommendation is to test these approaches in a pilot study to examine the impact on response rates.

Participants who did not log onto the system were contacted to ask why they didn't go on to take part in the study and responses were received from 74 people. Of those, 28% had problems with internet connection or logging onto the system and just 7% found the recalls too complicated. A significant proportion (18%) were unable to participate due to the timing and short duration of the field test.

Participants who completed some but not all of the recalls were also contacted to ask why they did not complete the survey. Responses were received from 33 people, of those, 45% either believed they had completed the survey or did not see any further emails relating to the survey. In addition 30% of people who responded opened the email but had missed the allocated day and therefore stopped taking part. This suggests that clear and continued communication with participants is vital and that telephone support for those failing to complete recalls may encourage people that had misread the information to continue to participate.

Feedback on the system from those who used it was really positive with INTAKE24 being reported to be user friendly and enjoyable to use. The majority of participants *agreed* or *strongly agreed* that they would like to use INTAKE24 often, (44% compared with 15% who *disagreed* or *strongly disagreed*). Sixty seven % of participants *disagreed* that the system was unnecessarily complex or had too many inconsistencies, and 23% *neither agreed nor disagreed*. Over three quarters of participants *agreed* that INTAKE24 accurately captured their dietary intakes and over 80% *agreed* that the system was easy to follow and understand.

Further developments to the system have been implemented based on feedback from the field testing. These developments have included adding a newer and shorter video tutorial, adding a large number of foods to the database and refining different aspects of the system. In addition, other improvements will be carried out such as adding a 'Frequently Asked Questions' section to help to answer user's queries, making the recipe tool and the 'add your own sandwich' tool more obvious to users, accommodating the option for adding in second helpings and amending the system to give individuals personalised feedback on their dietary intake. All these developments will improve the usability of the system.

Whilst this was a field test, and although the nutritional data obtained cannot be representative of the population (and also that with all self-reported dietary measures, there is a strong

likelihood of underreporting to some degree), it was necessary to look at findings from other surveys to check the data are comparable. The energy levels reported using INTAKE24 were similar (in both the four and two day analysis) to levels reported in NDNS 2008/09-20011/12 (for females 1570 and 1654 kcal/day in INTAKE24 cf. 1564 kcal/day in NDNS 11+ years, and for males 1834 and 1926 kcal/day in INTAKE24 cf. 2006 kcal/day in NDNS 11+ years) which, along with the results of comparison with interviewer led recalls suggests INTAKE24 may be a viable alternative to more intensive and costly methods. It also suggests that two days of recalls may be sufficient, as the data obtained from using two recalls compared with using four recalls was very similar. Furthermore, asking participants to complete just two recalls would be less burdensome and may result in a higher response rate.

Results from the field test show that INTAKE24 is a viable option to measure dietary intake in the population. However, further testing and refinement of the respondent recruitment strategy would be needed, in addition to subsequent testing of the approach, to assess its efficacy.

Food Standards Scotland propose testing INTAKE24 as part of the Scottish Health Survey (SHeS) which is a large-scale population survey administered in the home by a face-to-face interviewer. Introducing INTAKE24 as part of a study like the SHeS is likely to improve response rates and the usability of population level detailed dietary data. The results from this further testing will be available in due course.

2 Introduction

One of the biggest challenges in nutrition research is to accurately assess dietary intake [1]. Collecting large scale population data on dietary intake is fundamental to the development of public health policies and dietary guidelines and goals, such as the Revised Scottish Dietary Goals published by the Scottish Government in 2013. Food Standards Scotland requires evidence-based diet and nutrition information to improve dietary health, and the assessment of dietary intake is an extremely important part of this. Traditional pen and paper dietary assessment methods are costly, time consuming and impractical for both researchers and participants, e.g. recording and weighing foods consumed and manually coding each dietary entry for nutritional output, resulting in under-reporting and inaccurate data. Technology offers the potential to collect dietary intake from large numbers of people simultaneously while reducing the need for manual coding and data entry by researchers. Web-based dietary assessment methods allow participants to complete a dietary survey at a time that is convenient to them and in the comfort of their own surroundings. Although Food Frequency Questionnaires (FFQ) have often been used in large scale surveys and are low cost, they have been shown to be prone to substantial measurement error, both random and systematic [2-5]. There is evidence that 24-hour recalls and food diaries provide more accurate and less biased estimates of usual dietary intake than FFQs and that two-four recalls are better than an FFQ for estimating usual intake of all but those food groups which are rarely consumed [6].

In previous research commissioned by Food Standards Agency Scotland (FSAS)², the INTAKE24 online 24-hour dietary recall system was developed by testing use of the programme with 11-24 year olds to enable monitoring of dietary intakes. Relative validation of the system compared with interviewer led recalls showed that intakes of energy and macronutrients were within 1% on average. INTAKE24 was found to be much faster to complete compared with an interviewer led recall, with an average recall being around 12 minutes and 20-25 minutes, respectively [7].

INTAKE24 can enable rapid and detailed dietary information to be obtained from participants remotely and without the need for an interviewer to enter the dietary data. In addition it ensures consistent coding. Further development and evaluation of the system using a sample with a wider age range was necessary to evaluate the system's usability with a sample of the Scottish population in both young people aged 11+ and in adults aged 16+. In order to evaluate INTAKE24 people that had taken part in the Scottish Health Survey previously (between 2013 and 2014) were invited to test INTAKE24 by completing four recalls and a feedback

² Note that as of 1st April 2015 Food Standards Scotland (FSS) took over all of the functions previously carried out by Food Standards Agency in Scotland (FSAS).

questionnaire. This report focuses on the findings of this evaluation including response rates (in terms of agreement to take part in the research and completion of the recalls), the usability of the system from participants' perspective and an assessment of the dietary data provided by participants.

3 Aims

The aim of the study was to test the usability of the INTAKE24 system in the general population and to further develop it based on user feedback and any emerging issues. The target was to recruit a sample of people ranging in age from 11 years-old up to, and including, older adults and for them to complete a series of four 24-hour recalls using the INTAKE24 system spread over both week days and weekend days. Participants were also asked to complete a survey providing their feedback on usability of INTAKE24. This gave ideas for further improvement and development of the system and highlighted any issues within the system which needed to be resolved.

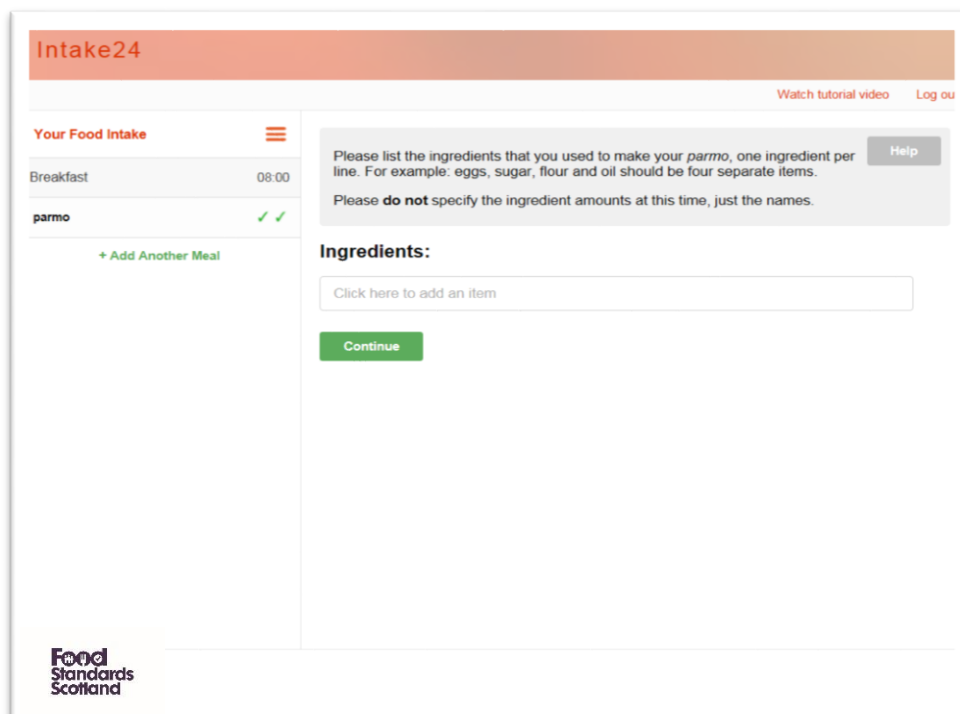
In addition, the study aimed to assess the suitability of INTAKE24 as a system for collecting dietary information from Scottish Health Survey (SHeS) participants, with a view to it being included in the SHeS in the future. Specifically the study aimed to examine the performance of INTAKE24 in the field including, attrition rates, snagging issues, and ability to assess progress towards the Dietary Goals for Scotland by age, gender, Body Mass Index (BMI) and Scottish Index of Multiple Deprivation (SIMD).

4 Further developments to INTAKE24 prior to field testing

Developments to the system were carried out to make the system more user-friendly, with aspects added to help the user complete their recalls. In addition, ways to capture information about foods that are not in the INTAKE24 database were added, including an option for recording recipes for homemade dishes.

4.1.1 Recipe function

A recipe function was developed enabling users to add in homemade recipes if a particular composite dish isn't found in the food database, or if the food is found but the user would still like to add a recipe. Users are able to add in each individual ingredient in the recipe followed by the amounts either by weight (grams or mL), or by standard portion size measures such as tablespoons or a similar measure used for the particular food item e.g. a slice. For foods such as peppers, users are able to add how many whole peppers they had, as well as being able to choose a half or a quarter of a pepper. Users are also able to state the amount they consumed and if they left any of the food. This function allows users to add homemade foods to their recall, potentially increasing the accuracy of their recall and highlighting common dishes consumed by the study population which could be added into the food database. Recipes are stored and returned in subsequent searches made by that individual.



The screenshot shows the Intake24 web interface. At the top, there is a navigation bar with the 'Intake24' logo on the left and links for 'Watch tutorial video' and 'Log ou' on the right. Below the navigation bar, the main content area is divided into two columns. The left column, titled 'Your Food Intake', contains a list of meals: 'Breakfast' at '08:00' and 'parmo' with two green checkmarks. A '+ Add Another Meal' button is located below the list. The right column is for adding ingredients. It features a 'Help' button and instructional text: 'Please list the ingredients that you used to make your *parmo*, one ingredient per line. For example: eggs, sugar, flour and oil should be four separate items. Please **do not** specify the ingredient amounts at this time, just the names.' Below this text is an 'Ingredients:' section with a text input field containing the placeholder 'Click here to add an item' and a green 'Continue' button. The 'Food Standards Scotland' logo is visible in the bottom left corner of the interface.

Figure 1. Recipe function tool screen capture

4.1.2 Missing foods function

The missing foods function was added to enable users to add foods which are not found using the database search function but are not homemade (and therefore the ingredients aren't known). This tool also allows the food database to be updated with those foods which users highlight as 'missing' meaning the system can be constantly improved and the food database can be updated and expanded. Users are asked to give as much information about their food as possible, including brand if appropriate, a full description of the food and their portion size. They are also asked 'how much did you leave?' to enable the most accurate estimation of their food intake.

The screenshot shows the 'Intake24' web application interface. On the left, a sidebar titled 'Your Food Intake' shows a list of meals: 'Breakfast' at 08:00 and 'parmo' with a green checkmark and a question mark icon. Below the list is a '+ Add Another Meal' button. The main content area features a message box stating: 'You said you were unable to find a good match for "parmo" in our food database. Please answer the following questions to help us identify this food and add it to our food list.' Below this message are five input fields: 'What is the name of the missing food or ingredient?' (filled with 'parmo'), 'What brand is this food or (if any)?', 'What sort of food is it? Please provide a short description.', 'How much of this food you were served or have used in your recipe?', and 'How much did you leave?'. A green 'Continue' button is located at the bottom of the form. The 'Food Standards Scotland' logo is visible in the bottom left corner of the page.

Figure 2. Missing foods tool screen capture

4.1.3 Video tutorial

A walkthrough video tutorial was made to give a demonstration of the system, aiming to help participants to use INTAKE24. Video screen capture and voice over was used to show the many aspects of the system and a link enabling the user to watch the tutorial at any point during a recall was added. The video tutorial shows many features including how to add foods at different meal times, how to add or delete a meal, where help can be found, how to change the times of meals and how to add in missing food items.

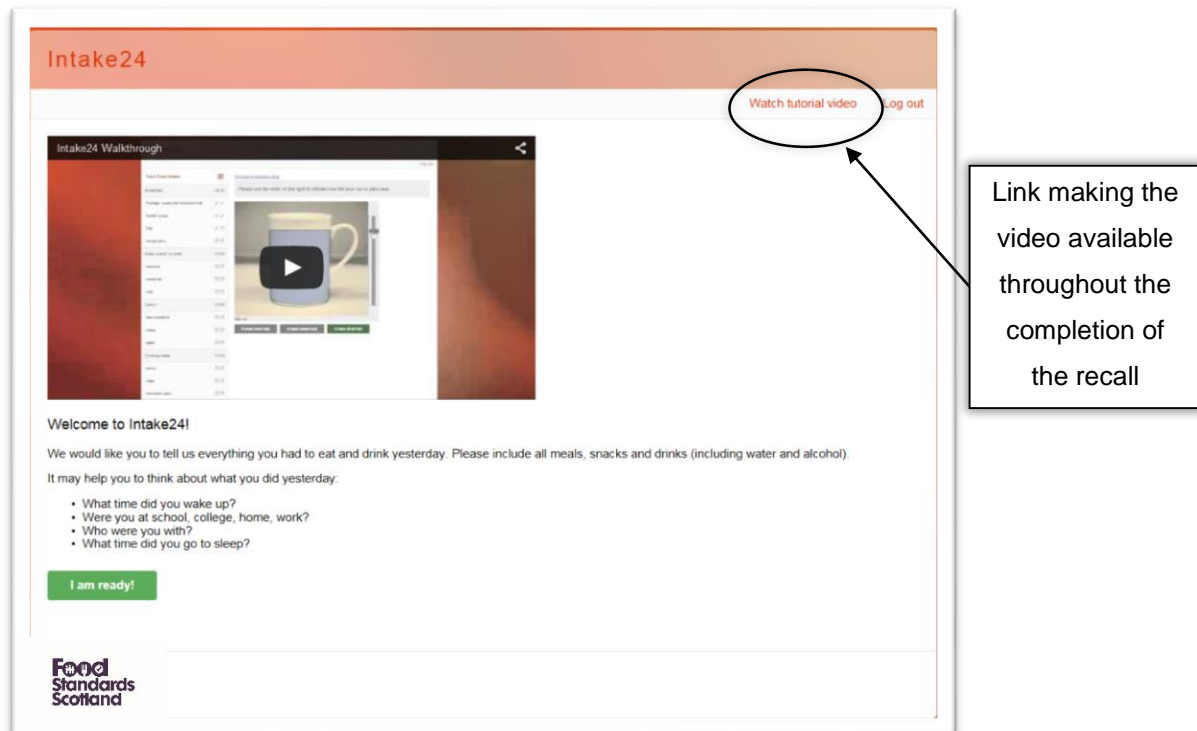


Figure 3. Video tutorial screen capture

4.1.4 Task specific help

A 'help' button was developed to provide assistance which is specific to the current screen the user is on. The help button links to a series of tips explaining the actions of each button on the screen such as 'Click this when you have entered the correct time for this meal'. If the user is still unsure of what to do after reading the help tips, there is an 'I am still stuck' button which leads to further help via a telephone help request.

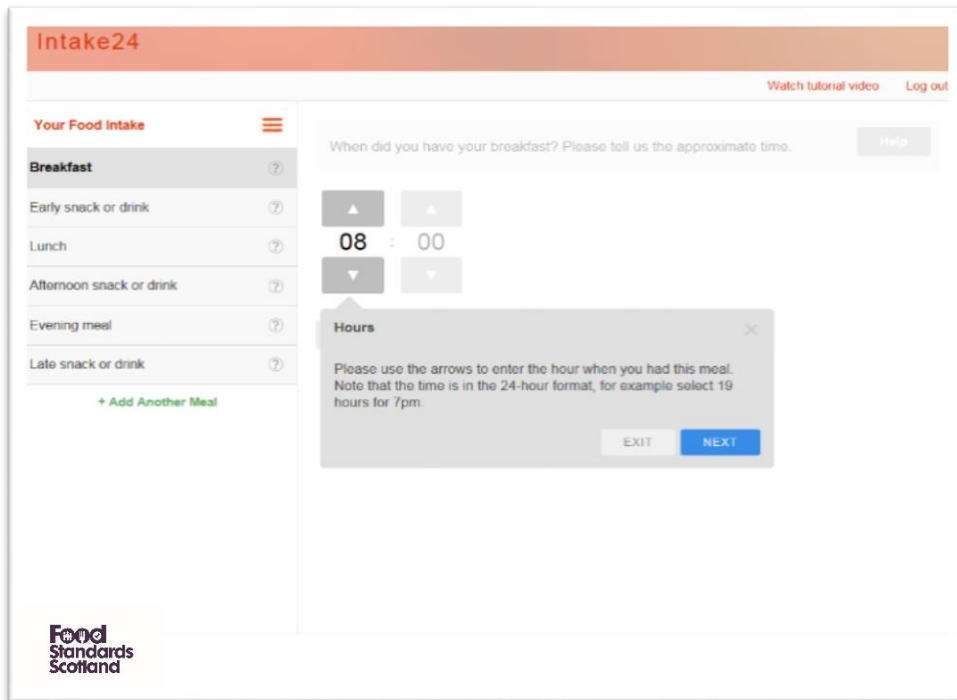


Figure 4. Help tool screen capture

4.1.5 Telephone help request

To provide further assistance to users, after the 'help tips' have been read, a telephone help request system was set up. If users have used the help buttons, yet are still unable to resolve their issue, then they could request a call from a member of the INTAKE24 support staff. Users are first reminded to watch the video tutorial, and then are asked to provide their name and phone number to allow the study team to contact them. The system allows user queries to be resolved and in addition, it allows the study team to record the aspects of the system which cause confusion so these can be highlighted for further development of the system.

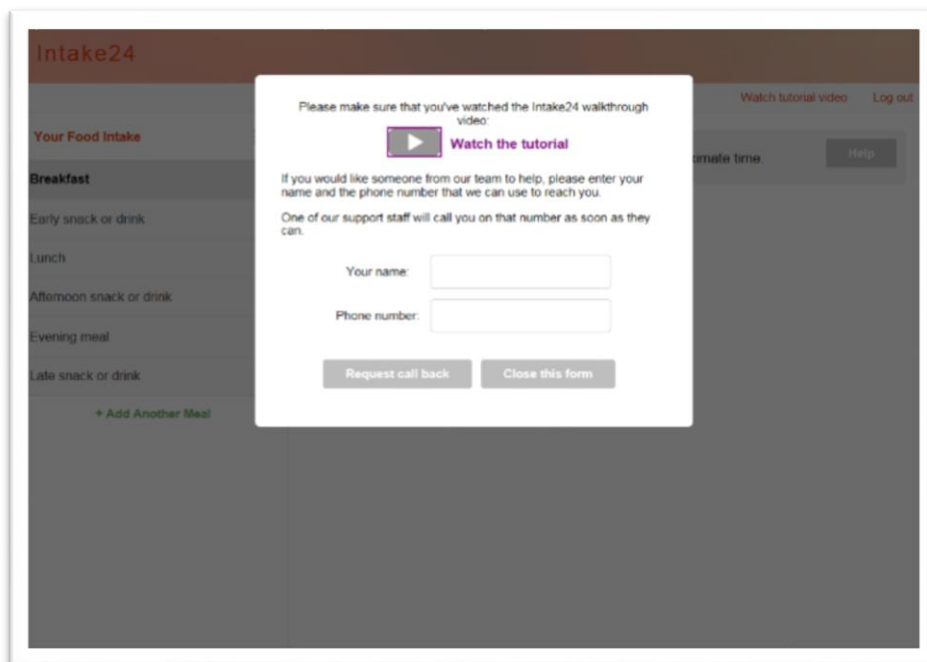


Figure 5. Telephone help request screen capture

5 Methodology (chief author – Shanna Christie)

5.1 Ethics

Ethical approval for the study was granted by the Newcastle University Faculty of Medical Sciences Ethics Committee – application number 00875.

5.2 Sample

In collaboration with ScotCen Social Research, a total sample of 1000 participants who completed the 2013 or 2014 (500 participants were recruited from each of the two survey years) Scottish Health Survey (SHeS) and had a phone number (obtained from the Household Reference Person), were invited to take part in field-testing of the refined system. The sample was stratified by age, gender and deprivation (the Scottish Index of Multiple Deprivation (SIMD) was used).

A minimum of 20 people in each separate stratum (detailed in Table 1 below) were selected with over-sampling in sub-sets of the population in which digital technology adoption and frequency of use is known to be low (e.g. older people and those living in the most deprived areas). As the sampling approach involved deliberately oversampling certain groups, the sample used in the field test cannot be said to be representative of the population of people living in Scotland or of the population of Scottish Health Survey participants.

Table 1. Actual sample quotas by key demographics

Gender	SIMD	Age (years)			
		11-16	17-24	25-64	65+
Male	1 (<i>Most deprived</i>)	25	25	45	45
	2	20	20	25	25
	3	20	20	25	25
	4	20	20	25	25
	5 (<i>Least deprived</i>)	20	20	25	25
Female	1 (<i>Most deprived</i>)	25	25	45	45
	2	20	20	25	25
	3	20	20	25	25
	4	20	20	25	25
	5 (<i>Least deprived</i>)	20	20	25	25

5.3 Recruitment

The stages below provide an overview of the fieldwork process used during the field test.

5.3.1 Stage 1 – Introductory letter about the study

Everyone in the sample was sent an introductory letter at the same time (end of May 2015) explaining the study and informing them that they would receive a phone call from the NatCen Telephone Unit soon. Depending on the age of the selected individual a different version of the letter was sent:

- *Children aged 11-15 whose parent/carer consented to them taking part in follow-up research* – letter sent to their parent/carer which included a leaflet for the child. Parents/carers were also provided with clear opt-out information for their child in the letter.
- *Young people aged 16-18 whose parent/carer consented to them taking part in follow-up research* – letter sent to their parent/carer as it was their parent/carer who consented to them being re-contacted about further health research. Parents/carers were provided with clear instructions on how to opt their child out if they did not want their child being directly contacted about the INTAKE24 study.
- *Adults aged 16 and over whom consented to follow-up research on their own behalf* – letter sent to adults as they themselves agreed to be re-contacted about further health related research.

Copies of the letters are provided in the appendix.

5.3.2 Stage 2 – Follow-up phone call from NatCen

After the introductory letters were sent, the NatCen Telephone Unit attempted to make contact with everyone in the sample (unless they had opted out/opted their child out on receipt of the introductory letter). The telephone calls were conducted over a five week period (early June-early July 2015).

The purpose of the phone call was:

- To provide more information about the study.
- Establish whether the individual wished to take part.
- Establish current use of the internet (if agree to take part).
- Collect additional contact details, including email address and mobile phone numbers (if agree to take part).

- Telephone interviewers made contact with a parent/carer in cases where the selected person was under the age of 16.

5.3.3 Stage 3 - Prompting participants to complete the diary on the assigned day

Individuals that agreed to take part were asked to complete INTAKE24 on four occasions/days over a ten day period. The days that an individual was assigned depended on when the Telephone Unit made contact with the individual. Table 15 shows the days that were assigned according to the date of contact. Note that there was a time lag between when participants were contacted and when they were asked to complete their first recall. The fieldwork period for recall notifications was 11th June to 21st July 2015 for everyone that agreed to take part in the field test.

The method of prompting participants to complete INTAKE24 depended on whether they provided and/or regularly checked email accounts and/or mobile phones:

- If the participant **agreed** to provide a **mobile phone number and/or email address** then they were sent a text and/or email on the four days they were due to complete the recall. The text and email provided a link to the INTAKE24 website, their login details and instructions to complete the diary for the previous day.
 - If the participant did **not agree** to provide a **mobile phone number or an email address**, they mentioned that they did not check these regularly or no contact was made with them at stage two (follow-up phone call) then they were sent a letter. The letter included a link to the INTAKE24 website, their login details and the dates that they were to complete the recall on if they wished to take part.
- All prompts for participants aged 11-15 were sent to the parent/carer (letter/email/texts) to pass on to the child.

Texts and emails included an 'unsubscribe' option so anyone who did not want to continue to participate could opt out via this method and they would no longer continue to receive texts and/or emails.

Copies of the emails, texts and letters are provided in the appendix.

5.3.4 Stage 4 - Optional field visit from an interviewer (applies only to some participants)

Any participant that was identified as not being confident using the internet or devices connected to the internet by the telephone interviewer was asked if they would like an interviewer to visit them in their home to help them complete the first recall. If they agreed, a trained NatCen interviewer visited them in their home and assisted them with completing the

first recall. If they were able, participants could then complete the remaining three recalls on their own.

5.3.5 Stage 5 – Feedback questionnaire

Participants that logged on to complete INTAKE24 could access the feedback questionnaire on their final recall (fourth day) or if they did not intend to complete any additional recalls they could complete the questionnaire at an earlier stage. The feedback questionnaire asked participants about their experiences of using INTAKE24 as well as any problems or issues they had with using the system.

5.3.6 Stage 6 – Thank you

Participants that completed INTAKE24 on four days (regardless of whether they completed on the correct days or whether they completed more than four days) were sent a £20 Post Office voucher to thank them for their time.

- Post Office vouchers were sent to the parent/carer of anyone aged under 16.

5.3.7 Stage 7 – Feedback questionnaire for participants that stopped completing (applies to only some participants)

Participants that initially agreed to take part but then stopped completing the recalls (only completed one, two or three recalls) were sent a brief questionnaire to ascertain their reasons for not completing all four days.

5.3.8 Stage 8 – Feedback from participants that agreed but did not complete any recalls (applies to only some participants)

Participants that initially agreed to take part but did not then log on to the system and complete any recalls were telephoned to find out why they didn't complete any recalls at all.

6 Response to the field test (chief author Shanna Christie)

This chapter presents the results of the field test in terms of agreement and response rates to the various stages of fieldwork including by key demographics.

6.1 Fieldwork Procedure Summary

Chapter 5 provides full details of the study methodology and the ways in which participants were recruited to take part. A brief description of the stages and a diagram which summarises the fieldwork procedure is provided below as it is helpful to consider these stages when presenting response to various elements of the field test:

- **Stage 1** – Introductory letter sent to full sample.
- **Stage 2** – NatCen Telephone Unit attempted to contact everyone in the sample. Email and/or mobile phone numbers collected from those that agreed to take part.
- **Stage 3a** – Email and/or text notification sent to participants on four days over the course of a ten day period asking them to complete their recall for the previous day.
- **Stage 3b** – Letter notification sent to participants where no phone contact made or where prefer letter/no use of email/mobile phone.
- **Stage 4** – Optional field visit for those participants identified as not being confident with computers/internet.
- **Stage 5** – Participant feedback on INTAKE24.
- **Stage 6** – Thank you letter sent to participants that completed a minimum of four recalls.
- **Stage 7** – Feedback from those that agreed and stopped completing recalls (partials).
- **Stage 8** – Feedback from those that agreed and didn't complete any recalls.

Stage 1 – Introductory letter received

This letter explained what the study was about, what taking part involved and mentioned that the participant would receive a phone call soon to tell them a bit more about the study.



Stage 2 – Phone call from NatCen

The aims of the phone call were: to establish contact; if contact was made, to establish participation; if participant opted-in, to establish whether they agree to provide mobile number and email address.



Stage 3 (a) – Notification to complete recalls

Email/text notification was sent to participants that opted-in to study and provided email address/mobile phone number. Notifications were sent on four separate days over a ten day period.



Stage 3 (b) – Notification to complete recalls

A letter was sent to participants that were; contacted by phone and agreed to take part but chose letter notification; or if no contact was made and therefore postal notification was the only option. This letter included the four dates to complete the recalls on.



Stage 4 – Optional field visit

Participants that were identified as lacking in confidence/capabilities with using computer/internet were offered the option of an interviewer helping them complete the first recall in their home. The interviewer would then provide participants with the dates of the other three recalls to complete on their own.



Stage 5 – Feedback

Participants were asked to provide feedback on INTAKE24 in terms of the usability of the system and how they found using particular features (including using the portion size selection and adding recipes). Participants that agreed to take part but either never started completing INTAKE24 or stopped before completing four recalls were asked to provide feedback on why this was.



Stage 6 – Thank you

Participants that completed at least four recalls were sent a thank you letter which included a £20 Post Office voucher.

This chapter presents the response rates for the Telephone Unit recruitment stage, the recall stage (including response rates for full completion i.e. four recalls and partial completion i.e. fewer than four recalls), uptake of the field visit option, and level of response to the letter only form of communication (i.e. no contact made by the Telephone Unit). Key response rates are also presented by key demographics including gender, age and deprivation as well as Body Mass Index (BMI) which is a useful measure of nutritional status and health.

Where appropriate, statistical significance testing was performed to establish whether or not there was any real difference between groups in either response to the telephone unit stage or the recall stage. The approach chosen was logistic regression which enabled the testing of between group differences. For example whether there was any statistically significant difference in agreement to take part in the study by age group. Tests that showed a significant difference at the 5% level are indicated by * and tests that showed a significant difference at the 1% level are indicated by **.

Feedback from those that agreed to take part but either stopped completing recalls before completing four and those that agreed to take part at the telephone recruitment stage but didn't complete any recalls is provided in Chapter 8.

6.2 Telephone Unit recruitment stage

This stage involved NatCen telephone interviewers attempting to contact the whole sample (1000 people). Telephone interviewers made a minimum of seven call attempts across a range of different times (including during the day, evenings and weekends).

6.2.1 Overall response at Telephone Unit recruitment stage

Table 2 below shows that the Telephone Unit was able to make contact with three-quarters of the sample (75%). Note that in some cases while contact was made it may not have been with the selected participant. This could have been for a number of reasons including a member of the household refusing on behalf of the selected participant (proxy refusal), or the selected participant being no longer resident or being deceased.

Table 2. Telephone unit contact

Outcomes	n=	%
Contacted	747	75%
No or minimal contact made (eligibility uncertain/letter sent)	253	25%
<i>Base</i>		1000

Table 3 presents a summary of the outcome codes used by the Telephone Unit to classify the outcome for people in the sample where contact was made. A full breakdown of all the codes

used by the Telephone Unit is provided in the appendix. Just over half (51%) of those that the Telephone Unit contacted from the sample agreed to take part in the field test (this consisted of 50% agreeing and providing email/mobile phone number/opting for a letter and 1% agreeing to a field visit).

The table also shows that a small proportion of people in the sample (10%) that the Telephone Unit contacted were classed as ‘ineligible’. These were people whose circumstances have changed since completing the Scottish Health Survey (SHeS) (i.e. physically or mentally unable to take part or ill), or they have since died or moved and we were not able to contact them. It also includes people who were not able to take part as they were not available during the fieldwork period (i.e. those that mentioned they were on holiday or in hospital during the fieldwork period). This group have been defined as ineligible as they would not have been able to take part in the field test regardless of the administration of the dietary assessment method (i.e. online or face-to-face) and would also have been unable or unlikely to take part in the SHeS currently therefore would not have been eligible to take part in a related study (as the initial SHeS interviewer visit would have been unproductive).

Table 3. Telephone unit outcome codes among those where contact was made

Outcomes	n=	%
Agreed	373	50%
Agreed to field visit	11	1%
Refusal (inc. info refusals and proxy refusals)	239	32%
Unable ³	53	7%
Ineligible (no letter sent)	71	10%
<i>Base</i>		747

Table 4 below presents the response rates among those that were:

- Contacted at the Telephone Recruitment stage *and*;
- were considered eligible to take part.

As highlighted above, a group that were classed as ineligible were identified at the telephone recruitment stage and because they were considered ineligible they have been excluded from analysis of response to the field test.

Excluding those that were ineligible, 57% of people in the sample agreed to take part in the field test (consisting of those agreeing and providing email/mobile phone number, opting for a letter and agreeing to a field visit) while 35% refused and 8% were not able to participate due to various reasons (see Table 11).

³ People classified as being unable to take part tended to not have access to the internet or a device linked to the internet or did not feel comfortable/competent using devices. See Table 11.

Table 4. Telephone unit outcome codes among those where contact was made and defined as eligible

Outcomes	n=	%
Agreed	373	55%
Agreed to field visit	11	2%
Refusal (inc. info refused and proxy refusals)	239	35%
Unable ⁴	53	8%
<i>Base</i>		676

6.2.2 Response at Telephone Unit recruitment stage by demographic factors

The following tables present response rates at the Telephone Unit recruitment stage by key demographics – age, gender and area deprivation (using Scottish Index of Multiple Deprivation) as well as Body Mass Index (BMI). The tables shown in this section include people in the sample that were contacted by the Telephone Unit and classed as eligible to take part.

Table 5 below presents response at the Telephone Unit recruitment stage by gender. The table shows that men and women in the sample were equally likely to agree to take part (59% and 55% respectively), to refuse (34% for men and 37% for women) and to be unable to take part (7% for men and 8% for women) in the field test.

Table 5. Telephone unit outcomes by gender

Outcomes	Male	Female	P
Agreed (inc agreed field visit)	59%	55%	0.206
Refusal (inc. info refused and proxy refusals)	34%	37%	0.314
Unable ⁴	7%	8%	0.589
<i>Base</i>	343	333	

Table 6 below shows the response rates to the field test at the Telephone Recruitment stage by age. There is a marked difference in response among the sample by age group. Those in the youngest age group (11-16) were the most likely to agree to take part in the field test (81%) compared with 65%-67% of those aged 17-64 and 27% of those aged 65 and over ($P < 0.001$). It is worth bearing in mind however that parent/carers were agreeing to participation on behalf of children aged 11-15 (therefore the majority of the youngest age group) and at the Telephone Unit recruitment stage the agreement of the child themselves was not secured.

Those in the oldest age group (65+) were the most likely to refuse to take part (54% compared with 18%-31% in the other age groups) and the most likely to be unable to take part (19% compared with 1%-5%).

⁴ People classified as being unable to take part tended to not have access to the internet or a device linked to the internet or did not feel comfortable/competent using devices. See Table 11.

Table 6. Telephone unit outcomes by age

Outcomes	Age				P
	11-16	17-24	25-64	65+	
Agreed (inc. agreed field visit)	81%	67%	65%	27%	<0.001**
Refusal (inc. info refused and proxy refusals)	18%	31%	30%	54%	<0.001**
Unable ⁵	1%	2%	5%	19%	<0.001**
Base	151	121	183	221	

Table 7 below shows response to the study at the Telephone Recruitment stage by Scottish Index of Multiple Deprivation (SIMD). Although there is an observable difference in agreement to participate rates among the sample by SIMD it is not statistically significant. Sixty % of people in the sample living in the least deprived quintile agreed to take part compared with 50% living in the most deprived quintile. While the table shows an observable difference in the proportion of people being unable to take part by SIMD again this result was not statistically significant. The rate was highest among those living in the 20% most deprived areas in Scotland (13% compared with 4%-8% in the other quintiles).

Table 7. Telephone unit outcomes by Scottish Index of Multiple Deprivation (SIMD)

Outcomes	SIMD Quintile					P
	1 (most deprived)	2	3	4	5 (least deprived)	
Agreed (inc. agreed field visit)	50%	58%	59%	60%	60%	0.257
Refusal (inc. info refused and proxy refusals)	38%	35%	37%	32%	34%	0.840
Unable ⁵	13%	7%	4%	8%	6%	0.070
Base	174	111	136	126	129	

Table 8 below presents response to the study at the Telephone Recruitment stage by Body Mass Index (BMI) which was measured at the time of the SHeS interview (up to two years prior to taking part in the field test). There was a significant difference in agreement rates among the sample according to their BMI classification (P=0.012). It should however be noted that the base sizes are particularly low with very few people in the sample classified as underweight or obese. When looking at the majority of the sample that were classified as either healthy weight, overweight or obese, agreement to take part in the field test was higher among those in the sample that were classified as healthy weight (65%) compared with 47%-56% among those classified as overweight or obese. Conversely refusal rates were highest among those in the sample that were classified as obese (43%) compared with only 30% of those in

⁵ People classified as being unable to take part tended to not have access to the internet or a device linked to the internet or did not feel comfortable/competent using devices. See Table 11.

the sample that were classified as being within the healthy range (although this was not statistically significant).

Table 8. Telephone unit outcomes by Body Mass Index (BMI)

Outcomes	BMI classification					P
	Under-weight	Healthy Weight	Over-weight	Obese	Morbidly obese	
Agreed (inc. agreed field visit)	[86%]	65%	56%	47%	58%	0.012*
Refusal (inc. info refused and proxy refusals)	[14%]	30%	34%	43%	33%	0.118
Unable ⁵	[0%]	5%	9%	10%	8%	<0.001**
Base	7	255	195	126	24	

6.2.3 Reasons for refusal at Telephone Unit recruitment stage

Those individuals in the sample who did not want to take part in the study, were asked for the reasons why and were allowed to mention as many reasons as they felt were relevant. Table 9 below shows the reasons people gave for opting not to take part if they gave a reason⁶.

Table 9. Reasons for refusal to take part in study

Reasons	n=	%
Not interested in study	37	34%
Do not have time to take part	30	28%
Other	22	20%
Health reasons	18	17%
Do not take part in research	6	6%
Age (too old to take part)	6	6%
Do not have access to the internet	3	3%
Do not have access to device linked to the internet	2	2%
Not comfortable talking about own diet	2	2%
Child does not want to take part	2	2%
Never heard of ScotCen	1	1%
Not comfortable/competent using computers/tablets/smartphones	1	1%
Base		109

Not being interested in the study and lack of time to take part were the most common reasons claimed for opting out among people in the sample.

A significant number of 'other' reasons that didn't fit into any particular category were provided.

⁵ People classified as being unable to take part tended to not have access to the internet or a device linked to the internet or did not feel comfortable/competent using devices. See Table 11.

⁶ Note that some people did not give a reason for declining to take part.

These included:

- “Coming up to holidays and on a diet, doesn’t think it would be an accurate account”.
- “Previous survey was very long, put him off for this new one”.
- “Can’t read and write”.
- “Work night shifts away from home”.

Various health reasons were also given. The majority related to being unwell or required to go to hospital. One particular response stood out which was:

- “Worried about having diabetes and effect on results”.

It is difficult to estimate how common some of these barriers are as only a small number of these types of reasons were given by people in this sample, however prevalence could be higher were these reasons a pre-coded option and were the sample larger.

As expected those that refused to take part tended not to say it was due to lack of access to internet/device linked to the internet or lack of competency of using computers/tablets/smartphones as these were more likely to be reasons people gave for being unable to take part. It is likely that the people who said it was due to lack of internet access/device linked to the internet didn’t want to take part anyway and it wasn’t that they were *unable* to take part.

6.2.4 Likelihood of taking part using different approach among those that refused

Those in the sample that refused to take part in the INTAKE24 field test were also asked how likely or unlikely they would be to take part in the study if it was administered in a different way. It should be noted however that these people refused to take part and therefore the results of this should be treated with caution as there is no way of accurately assessing whether they would have actually gone on to participate fully.

The alternative options presented were:

- An interviewer visited them in their home to complete INTAKE24 using the interviewer's computer.
- A telephone interviewer called them to complete INTAKE24 with them over the phone.
- A paper version of INTAKE24 was posted to them to complete.

Table 10 below summarises the responses to these questions:

Table 10. Likelihood of completion if alternative mode of data collection among those that refused to take part

Mode of data collection	Very likely/Likely	Very unlikely/Unlikely
Interviewer field visit	11%	89%
Over the phone	16%	84%
Paper version	28%	72%
Base		94 ⁷

The vast majority of people that refused to take part would still be unlikely to take part if INTAKE24 was administered in a different mode (by interviewer, over the phone or via paper).

6.2.5 Reasons for being unable to take part at Telephone Unit recruitment stage

Table 11 below presents the reasons why people in the sample were unable to take part in the field test.

Table 11. Reasons for being unable to take part in study

Reasons	n=	Of those providing answer	Of sample with contact made and eligible
Do not have access to the internet	41	65%	6%
Do not have access to device linked to the internet	28	44%	4%
Not comfortable/competent using computers/tablets/smartphones	24	38%	4%
Respondent is going away or in hospital during fieldwork	3	5%	<0%
Age	3	5%	<0%
Base		63	676

The majority of people in the sample that were unable to take part, who tended to be older people (aged 65+), were not able to do so due to how INTAKE24 is administered namely requiring access to the internet, a device linked to the internet and a level of knowledge and/or confidence of using computers, tablets or smartphones.

6.2.6 Likelihood of taking part using different approach among those that were unable

People in the sample that were unable to take part were also asked how likely or unlikely they would be to take part if INTAKE24 was administered in a different mode (by interviewer, over the phone or via paper).

⁷ Note that the bases for each of the three questions varied slightly and the lowest is presented in the table. Not all people that refused to take part in the research answered these questions which is why it is lower than the number of people that refused.

Table 12. Likelihood of completion if alternative mode of data collection among those unable to take part

Mode of data collection	Very likely/Likely	Very unlikely/Unlikely
Interviewer field visit	58%	42%
Over the phone	69%	31%
Paper version	75%	25%
<i>Base</i>		50⁸

Again, it is important to be cautious about these results as stating that they were very likely or likely to participate with a certain mode does not prove that they would actually fully participate if they were offered this option. Among this group more people were likely to take part if INTAKE24 was administered differently compared with the group that refused (see Table 10 above). It should be noted however that the bases for this table are particularly low. For example Table 12 above shows that 75% of people that were not able to take part would complete a paper version which was higher than the other two alternative options including over the phone (69%) and with an interviewer visit (58%).

6.3 Dietary Recall stage

This section presents analysis of methods of notifying participants in the sample that they were due to complete a recall as well as response to the recall stage (full and partial completion in terms of one-three recalls, two + recalls or four + recalls). Note that participants that were excluded from the analysis of the dietary data because they were not considered to have completed the recall properly have been included in the analysis of response (20 people were considered not to have completed properly).

6.3.1 Methods for notifying participants of recalls

Participants in the field test were required to complete four recalls over a ten day period including a mix of weekdays and weekend days. The method by which participants were notified of their recall days varied depending on a number of factors:

- Whether the Telephone Unit was able to make contact.
- Whether the participant provided an email address.
- Whether the participant provided a mobile phone number.

As shown in Table 2, the Telephone Unit were not able to make contact with 253 people (25% of the total sample). As there was no other method of contact other than letter, these people were sent a login letter (see appendix) which provided them with the necessary information to

⁸ Note that the bases for each of the three questions varied slightly and the lowest is presented in the table. Not all people that were unable to take part in the research answered these questions which is why it is lower than the number of people that were unable.

take part should they wish to do so. In total only 20 (2%) people in the sample completed any recalls via this method. Due to the unlikelihood of this method of notification being needed if INTAKE24 was to be rolled out on a large-scale face-to-face study as there wouldn't be any situations of non-contact for study introduction (introduced as part of SHeS), this group have been excluded from the subsequent analysis of response to the recall stage. Table 13 below shows the number of recalls completed by this group.

Table 13. Study completion days among those that received letter only

Number of recalls	n=
0	233
1	7
2	0
3	1
4	11
5	1
<i>Total</i>	253

If the Telephone Unit made contact with the sampled individual and they agreed to take part, the interviewer would ask them if they were willing to provide an email address and mobile phone number. Participants were informed that this information would be used to notify them that they were due to complete their recalls. Participants in the sample that agreed to a field visit were not asked to provide an email address and or mobile phone number and were therefore excluded in this analysis.

Table 14. Willingness of people to provide contact information

Mode of contact	n=	%
Email and text	270	72%
Email only	79	21%
Text only	23	6%
Letter only	1	<1%
<i>Base</i>		373

Table 14 above shows that of those who agreed to take part in the field test, 93% provided an email address and 78% provided a mobile phone number (72% agreed to give both forms of communication). Just 6% of people that agreed were only willing to provide a mobile phone number. As it is easier to send more detailed information by email it is a positive sign that for most people communication was not only limited to text messages. With such high proportions agreeing to provide this information it could be suggested that this is an effective means of sending login information as well as notification of recalls being due. However it is also important to consider frequency of use of email accounts and mobile phones as daily checking

of these was required as part of the field test. Further consideration will be given to this issue in Chapter 12.

Only one participant requested a letter to be sent instead of being notified of recall days by email or text and this person has been included in the analysis of recalls.

6.3.2 Allocating recall days

If participants provided mobile phone number and/or email address they were sent email and/or text prompts to complete the recall on the days they were allocated. Participants were not told exactly which days they were allocated (as this can influence dietary behaviour) the telephone interviewers were able to give them the approximate date they would receive their first notification. Participants were sent an email and/or text on four days over the course of ten days asking them to complete their diary for the previous day. Participants were sent notifications on the four days regardless of whether they had completed previous recalls. There were no reminders as such – if a participants missed the first recall then they would still be sent notifications for the other three recalls but would not be sent a reminder to complete the first recall. This is discussed further in Chapter 12.

The days participants in the sample were allocated and their first recall day was dependent on when the Telephone Unit made contact with the participant, with each participant being placed in one of four groups. The table below (Table 15) shows which dates participants were instructed to complete according to when telephone contact was made. These days were chosen to allow for some degree of spread across days but also for simplicity in terms of administration as part of the field test. If INTAKE24 were rolled out days would be allocated at random to provide a spread of all the days of the week (Mon-Sun).

Table 15. Recall allocation days by when telephone recruitment took place (in year 2015)

Group	Phone make contact	Day 1	Day 2	Day 3	Day 4
1	3rd Jun-9th Jun	Thurs 11 th Jun	Sun 14 th Jun	Tues 16 th Jun	Sat 20 th Jun
2	10th Jun-16th Jun	Sat 20 th Jun	Tues 23 rd Jun	Thurs 25 th Jun	Sun 28 th Jun
3	17th Jun-25th Jun	Tues 30 th Jun	Sun 5 th Jul	Thurs 9 th Jul	Sat 11 th Jul
4	26th Jun-8th Jul	Sat 11 th Jul	Thurs 16 th Jul	Sun 19 th Jul	Tues 21 st Jul

Table 16 shows the number of days completed by participants in the sample as a proportion of both those that agreed to take part (including those requesting a field visit) as well as those classed as eligible (including those that refused and those not able) at the telephone recruitment stage.

Table 16. Study completion days

Number of recalls	n=	% of those that agreed	n=	% of those eligible
0	154	40%	446	66%
1	35	9%	35	5%
2	21	5%	21	3%
3	42	11%	42	6%
4	110	29%	110	16%
5	16	4%	16	2%
6	4	1%	4	1%
7	1	<1%	1	<1%
8	0	0%	0	0%
9	1	<1%	1	<1%
Total	384⁹	384	676	676

The largest group are those that did not complete any days, with around three in ten of those that agreed to take part in the field test completing all four days (and around a third completing at least four days due to some participants completing additional days of recall).

A summary of response to the recall stage of the field test is provided in Table 17 below.

Table 17. Summary study completion days

Number of recalls	n=	% of those that agreed	n=	% of those eligible
0	154	40%	446	66%
1-3	98	26%	98	15%
4+	132	34%	132	20%
Any	230	60%	230	34%
2+	195	51%	195	29%
Total	384⁹	384	676	676

In total 34% of people identified as eligible completed any recalls with the majority not completing any (66%). Of those in the sample that agreed to take part in the field test, 60% of people went on and completed at least one recall while 40%, although agreeing to take part, didn't complete any recalls. Twenty % of those eligible to take part completed at least all four recalls with only 29% completing at least two recalls. Of those in the sample that agreed to take part the corresponding figures were 34% and 51%.

⁹ Note that this includes those people that initially agreed to a field visit but it was later established that they didn't have access to the internet

The following four tables show the number of recalls completed by key demographics including gender, age and deprivation as well as BMI. These tables are based on the people in the sample eligible to take part in the field test.

Table 18 below presents the proportion of people in the sample completing recalls by gender.

Table 18. Study completion by gender based on those that were eligible to take part

Completed recalls	Male as % of those eligible	Female as % of those eligible	P
	% eligible	% eligible	
0	65%	67%	0.593
2+	30%	28%	0.491
4+	20%	19%	0.558
Any recalls	35%	33%	0.593
Base	343	333	

The number of recalls completed did not vary significantly by gender with around two-thirds (65% of men and 67% of women) of people that were sampled and eligible not completing any recalls. The patterns of completion for two +, four+ and any recalls were similar for men and women.

Table 19 below shows study completion rates among the sample by age group.

Table 19. Study completion by age group based on those that were eligible to take part

Completed recalls	Age				P
	11-16	17-24	25-64	65+	
	% eligible	% eligible	% eligible	% eligible	
0	54%	55%	60%	86%	<0.001**
2+	38%	40%	33%	13%	<0.001**
4+	26%	26%	22%	9%	<0.001**
Any recalls	46%	45%	40%	14%	<0.001**
Base	151	121	183	221	

Whether or not sampled participants completed any recalls and the number of recalls they completed varied by age. Participants in the sample aged 65 and over were the least likely to complete any recalls with 86% in this age group not completing any recalls compared with 54%-60% in the other age categories (ages 11-64). Similar patterns were observed among those in the sample that completed two +, four + or any recalls.

Although eligible participants aged 11-16 were the second least likely to have completed any recalls, they were also the most likely to agree at the Telephone Unit stage (see Table 6). It is important to note that while it was the child that was completing the recalls it was their

parent/carer that agreed for them to take part initially. It is possible that the two stage consent process (as opposed to one stage for adults) affected the results and children declined to take part at the recall stage.

Further discussion about the potential limitations of this methodology and the options to address it is presented in Chapter 12.

Study completion rates by the Scottish Index of Multiple Deprivation (SIMD) are presented in Table 20 below.

Table 20. Study completion by Scottish Index of Multiple Deprivation based on those that were eligible to take part

Completed recalls	SIMD Quintile					
	1 (most deprived)	2	3	4	5 (least deprived)	P
	% eligible	% eligible	% eligible	% eligible	% eligible	
0	76%	69%	64%	62%	56%	0.005**
2+	20%	27%	32%	32%	36%	0.027*
4+	13%	20%	22%	21%	25%	0.095
Any recalls	24%	31%	36%	38%	44%	0.005**
Base	174	111	136	126	129	

Similarly to age, recall completion among the sample also varied by deprivation. Table 20 shows that 56% of those eligible to take part in INTAKE24 in the least deprived quintile did not complete any recalls compared with 76% in the most deprived quintile. Similar results were observed when looking at number of completed recalls among those in the sample with 25% of those in the sample living in the least deprived quintile completing all four days compared with 13% of those living in the most deprived quintile (although this was not found to be statistically significant). The equivalent result for two + days was 36% and 20%.

Table 21 below presents study completion rates by Body Mass Index (BMI) which is an indicator of nutritional status.

Table 21. Study completion by Body Mass Index (BMI) based on those that were eligible to take part

Completed recalls	BMI classification					P
	Under-weight	Healthy Weight	Over-weight	Obese	Morbidly obese	
	% eligible	% eligible	% eligible	% eligible	% eligible	
0	57%	58%	68%	75%	63%	0.029*
2+	43%	34%	27%	23%	38%	0.132
4+	43%	25%	18%	13%	17%	0.024*
Any recalls	43%	42%	32%	25%	38%	0.029*
Base	7	255	195	126	24	

Study completion rates among the sample were also related to BMI. Due to the small base sizes the underweight and morbidly obese groups are not commented on. The proportion of obese people in the sample that did not complete any recalls was highest at 75% compared with 68% among those that were overweight and 58% that were considered a healthy weight.

Additional tables showing completion rates as a proportion of those that agreed to take part are provided in the appendix. These tables are useful in examining the extent of drop-off between agreeing to take part and actual completion which is an issue which must be considered when a method such as INTAKE24 is introduced in a two stage way (i.e. being initially invited to take part followed by additional invitations to complete recalls).

6.4 Optional field visit stage

Only 11 people agreed to a field visit, with this typically being because they were not confident with computers/internet. All 11 participants were contacted by a field interviewer to arrange a suitable time and day to visit and assist with the first INTAKE24 recall. During the phone call the interviewer checked for availability during the field work period (17th July-2nd August 2015) and whether the participant had a device connected to the internet in their home. Only four participants had a productive field visit where the first recall was completed with the interviewer. The remaining people that had initially agreed to the field visit were either not available or did not have internet access.

6.5 Bounce-backs and opt outs

This section provides details about the emails and text messages that were sent to participants.

Table 22 shows the number of participants for whom the email address and/or mobile phone number resulted in a bounce-back¹⁰ or where they opted out of receiving notifications (this could possibly be interpreted as them no longer wanting to take part in the study or they had completed recalls in advance of receiving the notifications). Only five participants that agreed to take part did not receive any notifications because they only provided an email address or mobile phone and it bounced back from this device or the notification bounced back from both an email address and mobile phone number. This shows that only a small number of participants were unable to take part due to not receiving notification due to bounce-backs (although it is important to note that for some participants the notifications may have gone into their junk mail folder). It was also clear that very few people opted out of receiving notifications (only 16 people in total).

¹⁰ Emails bounced-back because the email address did not exist and text messages bounced-back because either the number did not exist or the participant did not have their phone turned on.

Table 22. Number of email/text bounce-backs and opt-outs

Completed recalls	n=	%
Email bounce-back	22	6%
Text bounce-back	24	8%
Email opt-out	6	2%
Text opt-out	11	4%
<i>Base emails</i>		355¹¹
<i>Base texts</i>		295¹²

Of the 355 participants that were sent emails, 260 opened at least one email (73%) and 185 clicked on the link in any of the emails (52% of those sent an email). It is not possible to find out how many participants opened any of the text messages, however typically over 95% of text messages are opened. The effectiveness of sending emails and text messages to notify participants that they are due to complete a recall is discussed further in Chapter 12.

¹¹ Note that some people were sent emails by mistake as they had originally provided this information but then said that they were not able to take part. This is why the base for this is higher than Table 14.

¹² Note that some people were sent texts by mistake as they had originally provided this information but then said that they were not able to take part. This is why the base for this is higher than Table 14.

7 Reported energy, nutrient intakes and food groups (chief author – Maisie Rowland)

Although results in the present study cannot be directly compared to larger surveys due to it being a field test as opposed to a large dietary survey, it was useful to analyse the nutritional data to check that similar nutrient intakes to previous studies were reported using INTAKE24. Whilst obvious under and over reporters were removed (see Chapter 7.4), it is likely that specific diets (such as the 5:2 diet) that participants might be on could affect the dietary data obtained (this is particularly noticeable by the NMES minimum value which was reported as zero - in this case, the participant stated they were on the 5:2 diet).

Data is presented as averages based on two recalls (the first weekday and weekend day completed were chosen where possible) and four recalls (where the first four days were included if they included a weekend-day, if they did not a weekend day was included where possible e.g. where people completed more than four days). Examining the differences in nutrient data obtained from two recalls with that obtained from four recalls may help to indicate how many recall days are required from participants. Those who only completed one day were not included in the nutrient analysis. It must be noted that with the two day analysis, the weekend days may be over represented slightly, however if only two days were chosen to report food intake in dietary surveys, the weekend days would need to be randomly assigned in a way where they are correctly represented.

7.1 Mean nutrient intake based on four recalls

For those participants completing four recalls, the reported mean energy intake was 1720 kcal with a wide range between 441 and 4446 kcal. Fat was reported to provide 33% of total energy and 15% was provided by non-milk extrinsic sugars (NMES). The reported mean carbohydrate intake was 222 grams with 65 grams from NMES. The reported average intake of total fat was 63 grams with 23 grams from saturated fat. The percent of energy from NMES is higher than the recommended <11% from the Scottish Dietary Goals.

Table 23. Mean energy intakes of participants– Based on data from four recalls

Nutrient	Mean	SD (±)	Min	Max
Energy (kcal)	1720	555	441	4446
Fat (g)	63	25	10	148
Fat as a % of energy (%)	33	6	19	52
Saturated Fat (g)	23	10	3	56
Protein (g)	66	25	25	199
Carbohydrate (g)	222	75	58	527
Total Sugars (g)	98	49	23	304
NMES (g)	65	46	1	261
NMES as a % of energy (%)	15	8	0	44
Alcohol (g)	7.6	23.7	0.0	249.2
Vitamin D (µg)	2.3	1.5	0.2	6.9
Vitamin A (µg)	581	358	60	1779
<i>Base</i>				132

Mean energy intakes were calculated for each demographic (age, gender, SIMD and BMI). Regarding the age groups, 17-24 year olds reported having the lowest energy intake with 1631 kcal whilst 65+ year olds reported the highest energy intake at 1997 kcal. Males reported to have consumed more energy than females, with a difference of 264 kcal. Looking at the SIMD, those in SIMD 4 consumed the highest energy intake of 1849 kcal and those in SIMD 1 had the lowest intake of 1598 kcal (Table 24 below). Those categorized as obese had the highest calorie intake of 1965 kcal and the morbidly obese reported the lowest 1341 kcal. It must be noted however that the energy value for those who were morbidly obese was based on only five individuals, and it has been previously found that obese individuals are more likely to under-report their own food intakes [8].

Table 24. Mean energy intakes of participants by age, gender, Scottish Index of Multiple Deprivation (SIMD) and BMI – based on data from four recalls

Group	Sub-group	n=	Energy (kcal) mean	±SD
Age (years)	11-16	41	[1699]	572
	17-24	30	[1631]	512
	25-64	42	[1680]	466
	65+	19	[1997]	706
Gender	Male	75	1834	540
	Female	57	1570	543
SIMD Quintile	SIMD 1 (<i>most deprived</i>)	21	[1598]	487
	SIMD 2	21	[1755]	640
	SIMD 3	31	[1735]	397
	SIMD 4	29	[1849]	730
	SIMD 5 (<i>least deprived</i>)	30	[1642]	482
BMI ¹³	Under weight	3¹⁴	[1616]	131
	Healthy weight	62	1744	542
	Over weight	37	[1623]	419
	Obese	16	[1965]	848
	Morbidly obese	5¹⁶	[1341]	280

¹³ Nine people were excluded from the BMI analysis due to there being no available data

¹⁴ It must be recognised that these base numbers are very low

7.2 Mean nutrient intakes based on two days of recalls

Data was also analysed for two recalls to allow a comparison with nutrient data collected when four recall days are used. For this analysis, only the first week day and weekend day was included (where possible). If this was not possible, the first two days of recalls were chosen. Participants who only completed one day were not included in any of the nutrient analysis.

The nutrient values obtained by basing analysis on two recalls were very similar with those obtained from the four recalls. This indicates that two days of recalls are likely to provide adequate data in terms of nutrient analysis.

Mean energy intake based on two recalls was 1801 kcal/day on average compared with 1720 kcal/day based on four recalls. Percentage energy from fat and from NMES was found to be the same at 33% and 15% respectively. The reported mean carbohydrate intake was 234 grams (222 grams for four recalls) with 69 grams from NMES (65 grams for four recalls). The reported average intake of total fat was 66 grams with 25 grams coming from saturated fat compared with 63 grams with 23 grams respectively for four recalls.

Table 25. Mean energy intakes of participants– Based on data from two recalls

Nutrient	Mean	SD (±)	Min	Max
Energy (kcal)	1801	625	517	3727
Fat (g)	66	30	11	194
Fat as a % of energy (%)	33	8	17	59
Saturated Fat (g)	25	13	3	105
Protein (g)	69	28	19	176
Carbohydrate (g)	234	88	66	568
Total Sugars (g)	104	58	18	403
NMES (g)	69	54	0	375
NMES as a % of energy (%)	15	9	0	48
Alcohol (g)	7.8	21.3	0.0	239.5
Vitamin D (µg)	2.3	1.8	0.1	11.6
Vitamin A (µg)	612	479	22	3029
<i>Base</i>				206

Similar to the four day analysis, average energy intakes were calculated for each demographic (age, gender, SIMD and BMI) for completion of two days. Again, the patterns were very similar to the four day analysis. The 17-24 year old age group reported having the lowest energy intake with 1738 kcal whilst 65+ year olds reported the highest energy intake at 1972 kcal. Males reported to have consumed more energy than females, with a difference of approx. 270 kcal. SIMD 2 were reported to have consumed the highest energy intake of 1993 kcal, with SIMD 4 having the second highest and those in SIMD 1, (the most deprived group) consumed the lowest intake of 1710 kcal (Table below).

Table 26. Mean energy intakes of participants by age, gender, Scottish Index of Multiple Deprivation (SIMD) and BMI – based on data from only two recalls.

Group	Sub-group	n=	Energy (kcal) mean	±SD
Age (years)	11-16	64	1800	626
	17-24	52	1738	637
	25-64	61	1775	554
	65+	29	[1972]	737
Gender	Male	111	1926	589
	Female	95	1654	637
SIMD Quintile	SIMD 1 (<i>most deprived</i>)	38	[1710]	589
	SIMD 2	29	[1993]	746
	SIMD 3	46	[1781]	566
	SIMD 4	45	[1835]	662
	SIMD 5 (<i>least deprived</i>)	48	[1743]	591
BMI ¹⁵	Under weight	4	[2088]	742
	Healthy weight	90	1904	697
	Over weight	54	1721	529
	Obese	30	[1745]	604
	Morbidly obese	10	[1537]	312

¹⁵ Eighteen people were excluded from BMI analysis due to no there being no available data

7.3 Food group analysis

Analysis of certain food groups, similar to those examined in the Scottish Health Survey (SHeS), was carried out for two recalls (n=206) and four recalls (n=132) to allow comparisons (Figure 6 below). Very similar values were observed between the two types of analysis indicating that asking participants to complete two recall days is likely to provide similar nutritional data in terms of food group data. In the appendix, a list of foods which were included in each food group presented in this report are given.

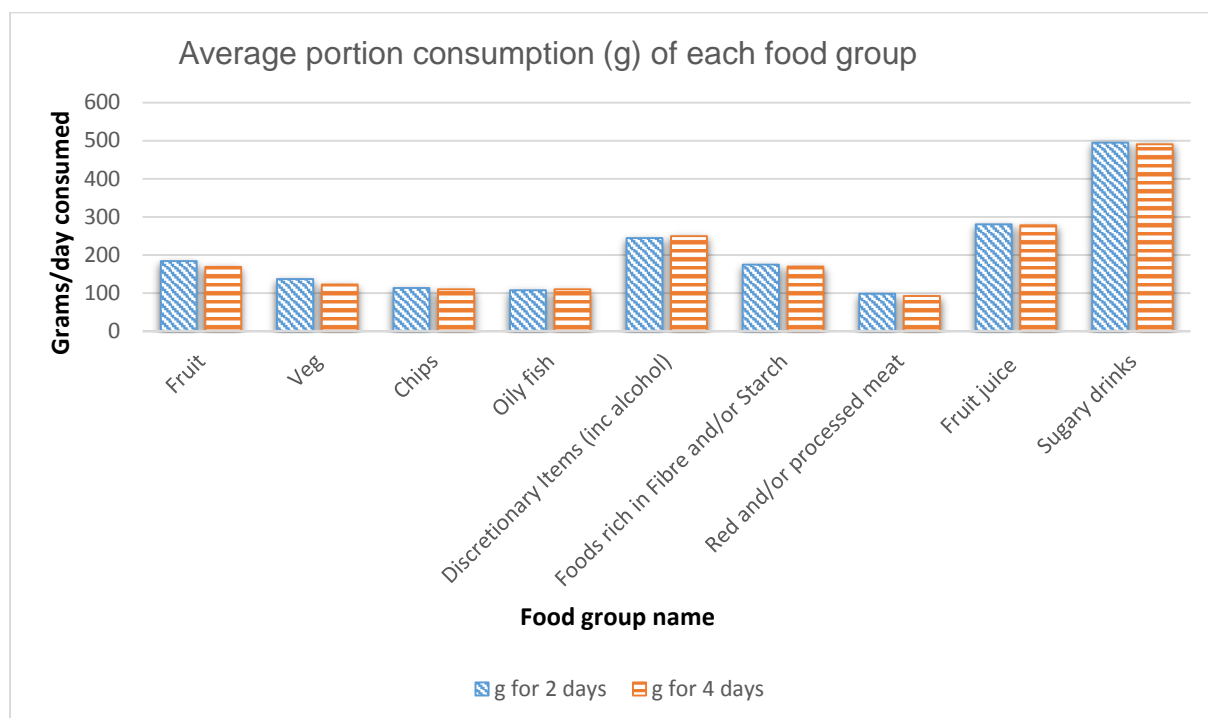


Figure 6. Average food group amounts consumed (g/day) comparison between two days of recall vs four days of recall

Table 27. Average food group amounts consumed (g/day) comparison between two and four recall days

Food Group	Weight (g) Two Days	± SD	Weight (g) Four days	± SD
Fruit	185	149	169	144
Veg	136	198	123	174
Chips	114	45	110	42
Oily fish	108	54	110	60
Discretionary Items	244	560	250	556
Foods rich in fibre and/or starch	175	123	170	122
Red and/or processed meat	98	83	91	81
Fruit juice	280	180	279	230
Sugary drinks	495	345	490	351

7.3.1 Fruit and vegetable intake

A portion of fruit or vegetables was classed as 80g based on the method used in SHeS. Fruit juices were in a separate food group with 150ml counting as one portion and any amount above this not counted. It was found that when analysing the data based on two recalls, the average consumption of fruit and vegetables was 2.3 and 1.7 portions respectively with 0.9 portions of fruit juice indicating that on average, 4.9 portions of fruit and vegetables were consumed. Using an average from four recalls, intake was reported at around 2.1 portions of fruit and 1.5 portions of vegetables with 0.9 portions of fruit juice. On average from the four recalls, 4.5 portions of fruit (including juice) and vegetables were consumed. Intakes of fruit were much higher than intakes of vegetables.

Again it must be noted that this information cannot be directly compared to portion sizes reported in large scale dietary surveys as this was not intended to be one, however it is interesting to consider these values to ensure the data obtained from the field test is relatively similar to that seen in dietary surveys.

As the participants who took part in this field testing study were recruited from those who took part in the Scottish Health Survey (SHeS), their reported fruit and vegetable intakes using the fruit and vegetable module in SHeS could be compared with those they reported in the field testing. For participants included in both the two day and four day analysis, their reported intakes were 1.2 portions of vegetables and 1.5 portions of fruit excluding fruit juices. When combining fruit and fruit juices, 1.9 portions of fruit were consumed giving a daily fruit and veg intake of 3.1 portions. The differences in fruit and vegetable consumption reported in SHeS and in the present study are likely due to the different methodologies.

Table 28. Mean fruit and vegetable portion intakes with standard deviations*

Food Group	Mean no. of portions from two recalls in field testing	±SD	Mean no. of portions from four recalls in field testing	±SD	Mean no. of portions reported in the fruit and veg module in SHeS from those included in the two recalls group	±SD	Mean no. of portions reported in the fruit and veg module in SHeS from those included in the four recalls group	±SD
Fruit (exc. fruit juice)	2.3	1.9	2.1	1.8	1.5	1.5	1.5	1.4
Fruit Juice	0.9	---	0.9	---	0.4	---	0.4	---
Vegetables	1.7	2.5	1.5	2.2	1.2	1.2	1.2	1.2
Total fruit and vegetable intake (inc. fruit juice)	4.9	---	4.5	---	3.1	---	3.1	---
<i>Base</i>	206		132		206		132	

*Due to the way that fruit juice portions were calculated, standard deviation values cannot be calculated.

7.3.2 Red and processed meats

The average intake of red and processed meat was 98 g/day based on two recalls and 92 g/day based on the analysis of four recalls. This intake is high compared to the recommended 70g/day stated in the Scottish Dietary Goals, although more men in the sample (who tend to consume more red and processed meats) may have been a reason for this. In terms of red and processed meats, foods such as ham, bacon, sausages and beef were included. Other foods such as 'beef dishes' which included foods such as beef casserole were not included in the analysis and therefore the amount consumed may actually be higher than shown (See appendix, Chapter 15.1).

7.3.3 Discretionary items and sugary drinks

The food group 'Discretionary items' included foods such as cakes, chocolates, sweets, biscuits, desserts and ice creams. The intake of these foods were high with a mean intake of 245 g/day based on analysis from two recalls, and 250 g/day based on four recalls. These foods are likely to contribute to the higher than recommended percentage energy from NMES.

Based on the four day analysis, discretionary items were consumed on 68 of the 528 days (approx. 13%) by 50 of the 132 individuals (approx. 38%). On the two day analysis discretionary items were consumed on 48 of the 412 days (approx.12%) by 45 of the 206 individuals (approx. 22%).

Sugary drinks included non-diet fizzy drinks and other sugary drinks (e.g. milkshakes, squash with added sugar in). The intake of these was also extremely high with an average consumption of 495 g/day based on two recalls and 490 g/day based on four recalls. These are both very high values which are also likely to contribute to the high sugar intakes observed.

7.4 Data quality checks

Quality checks were made to ensure the nutritional data obtained was as reliable as possible. This involved exclusion from the analysis of some participant's data who didn't complete recalls properly or made obvious mistakes.

Firstly obvious over and under reporters were removed e.g. if the calorie intake was extremely low or high and they had not stated that they had consumed either 'less than usual' or 'more than usual', or were on a diet. Another factor which was taken into account here was if a recall was completed in a very quick time e.g. two minutes. Around 20 individual recalls were excluded due to over or under reporting. Two participants were also subsequently removed from the analysis in the two + recalls group due to misreporting.

Every recall was also checked to ensure they were completed properly and no food items in the quick list were missed out. If participants had written multiple food items on one line of their recall e.g. 'toast, cereal, jam, milk, yoghurt' but had only added one food item (e.g. jam) to their recall, these could be identified and the appropriate food items were added. There were 12,557 individual foods recorded and 528 (~4%) extra foods were manually added due to these errors in recall completion (errors were made by 134 users). Of these extra foods, 51 of them (~10%) were due to participants not adding either cereal or milk to their recall, and 131 (~25%) were related to missing out bread or fillings/toppings to toast or sandwiches. Missed out food items were added to each person's recall, and the average portion sizes of each food item were calculated enabling nutritional information to be added. These issues highlighted aspects for system developments.

For some recalls, participants had written 'cereal' instead of typing a specific cereal name. In these cases, the most common cereal identified from other recalls (Cornflakes) was added. In the cases where a participant had typed something such as 'ham sandwich' but had only included one part of the sandwich e.g. 'ham' in the recall, white bread was added as the default bread, and a 62-72% fat non-polyunsaturated spread was added for foods where a spread or butter wasn't specified. In total, data checking and correction of the 12,557 recalls took around 51 hours to complete (approximately seven days' work).

7.5 Missing foods

Through the 'report a missing food' tool, 96 items were added by participants. From these, 151 individual entries were added to the recalls and nutrient data was calculated accordingly. Many of these foods were already in the database, for example 'minestrone soup' and 'white toast, butter' and so were just recoded. Other foods such as 'grape juice' and 'snowball' were not in the database, and so were recoded and also added to the INTAKE24 food database. The missing foods option will assist in keeping the database within INTAKE24 as comprehensive and current as possible.

7.6 Timings of field testing

The average time to complete recalls based on the four recall days was 14 minutes. Two participants were excluded from this analysis with recall times well over 60 minutes, indicating they may have had a break when completing their recall and left their device logged on.

For the two day analysis, three participants were removed for the same reasons. The average recall time was 16 minutes.

Table 29. Average times (minutes) of recall completions for four and two day analyses

Number of Recalls	Mean	SD (\pm)	Min	Max	Base
Four recalls days	14	8	4	43	<i>n= 130</i>
Two recall days	16	10	5	56	<i>n= 203</i>

8 Participant Feedback on INTAKE24 (chief author – Maisie Rowland)

8.1 Feedback questionnaire stage

A questionnaire was created using the online program SurveyMonkey®. Study participants were asked to complete the feedback questionnaire once they had completed all four food recalls. Feedback was also encouraged from participants who were completing their *last* recall, i.e. they knew they wouldn't complete all four recalls. Users who didn't complete a recall would not have had the option to take part in this survey. Questions included asking participants about their reactions to INTAKE24 (e.g. whether they would like to use INTAKE24 often, how complex or easy they found the system and whether they think they would require help to use it.). In addition, there was a free text entry for further comments.

Overall 182 out of the 245 participants who logged onto INTAKE24 did the main feedback survey (74%). INTAKE24 was very well received overall and some examples of both positive and negative comments received are shown below.

8.1.1 Table of positive and negative feedback from participants

Table 30. Participant's comments on INTAKE24

Positive feedback	Negative feedback
<i>"Easy to use, enjoyable and user friendly"</i>	<i>"Visuals were dull, e.g. plain white plates on a white background"</i>
<i>"I was actually surprised at how simple the design was, after using programs to track calories like My Fitness Pal, I found this to be refreshing"</i>	<i>"If possible, minimize questions being asked"</i>
<i>"I honestly enjoyed taking part and my favourite area has to be the portion selection. Visual representation of what I had ate worked well for me and helped me give more accurate information"</i>	<i>"I doubt if many people would enjoy experience...too long and complicated...complex foods are hard to define e.g. if bought in a cafe"</i>
<i>"Fantastic, easy to use!"</i>	<i>"Used smartphone and found it difficult at times to navigate. Screen on left hand side was not visible"</i>
<i>"I think this was a really good idea not only for you but for me as well as I got to see the reality of what u eat on a everyday basis"</i>	

8.1.2 Summary of answers to the SurveyMonkey® Questions

Questions about the ease of use of INTAKE24 were asked to enable the assessment of how user-friendly the system is, to help to understand participant's perceptions regarding how complex they found it, and whether they felt there were inconsistencies within the programme. It was found that the majority of users *agreed* or *strongly agreed* that they would like to use INTAKE24 often, (44% compared with 15% who *disagreed* or *strongly disagreed*). Sixty seven % of participants *disagreed* that the system was unnecessarily complex or had too many inconsistencies.

Over three quarters of participants *agreed* that INTAKE24 accurately captured their dietary intakes and over 80% *agreed* that the system was easy to follow and understand. Overall from the participant feedback it was found that INTAKE24 was user friendly and enjoyable to use.

The vast majority of participants (84%) *disagreed* that they would require help using INTAKE24 with only 3% stating that they think that they would need help.

The vast majority of users *agreed* or *strongly agreed* that they were able to complete INTAKE24 in a reasonable time, with only 12% of participants *disagreeing* or *strongly disagreeing* with this statement.

Table 31. Participant feedback from SurveyMonkey® questionnaire

	Strongly disagree		Disagree		Neither agree nor disagree		Agree		Strongly agree	
	%	n=	%	n=	%	n=	%	n=	%	n=
Answer Options										
I think I would like to use INTAKE24 often.	3%	6	12%	22	40%	72	37%	67	7%	12
I found INTAKE24 unnecessarily complex.	17%	29	50%	86	23%	40	8%	14	2%	4
I think that I would need help using INTAKE24.	40%	69	44%	77	13%	22	2%	4	1%	2
I thought there was too much inconsistency in INTAKE24.	25%	43	42%	73	24%	42	6%	11	3%	5
I don't think people would learn to use INTAKE24 very quickly.	21%	36	49%	84	17%	30	13%	22	1%	1
I didn't feel very confident using INTAKE24.	32%	56	49%	86	15%	26	2%	4	1%	2
<i>Answered question</i>										182

Table 32. Participant feedback from SurveyMonkey® questionnaire

Answer Options	Strongly Disagree		Disagree		Neither agree nor disagree		Agree		Strongly agree	
	%	n=	%	n=	%	n=	%	n=	%	n=
INTAKE24 accurately captured my dietary information.	2%	4	4%	8	15%	27	70%	126	8%	14
INTAKE24 was easy to follow and understand.	2%	3	7%	12	8%	14	65%	117	18%	33
INTAKE24 is visually appealing.	2%	4	8%	14	34%	61	47%	83	9%	16
I was able to complete INTAKE24 in a reasonable time.	2%	4	9%	16	10%	18	63%	112	16%	28
I enjoyed using INTAKE24.	2%	4	7%	12	33%	59	49%	87	8%	15
<i>Answered question</i>										180

Regarding any problems users experienced whilst trying to find a food in INTAKE24, over two thirds of participants responded 'No', indicating the majority of users found the food items they were trying to enter. Of the 54 users who stated they did have a problem the most common issue was that they couldn't find the food item they were looking for in the database.

Table 33. Participant feedback for SurveyMonkey® questionnaire.

Did you have any problems when finding foods in INTAKE24?	
Answer Options	Response Percent
No	71%
Yes	29%
<i>Answered question</i>	180

In relation to estimating the food portion sizes, the vast majority of people stated that they didn't have any problems, with over 93% responding 'No' to this question. Of the 12 users who stated that they did have a problem estimating the portion size of foods, the problems they encountered included 'I ate more chicken than the largest portion size' and 'I feel that my responses remained approximations'.

Table 34. Participant feedback for SurveyMonkey® questionnaire

Did you have any problems with the portion size selection in INTAKE24?	
Answer Options	Response Percent
No	93%
Yes	7%
<i>Answered question</i>	181

A large proportion of users (58%) didn't enter homemade recipes, however of those that did enter a recipe, 75% stated that they didn't have any problems adding these in, compared to only 25% of users who had a problem using this function. The feedback from those that did have problems with entering a homemade recipe showed that the main problem was how to find the button to add in homemade recipes rather than using the recipe function itself with ten out of 20 participants reporting this problem. The recipe function was designed to be slightly hidden to encourage users to select composite dishes from the INTAKE24 database as this allowed automatic coding to the nutrition composition database and the use of images for portion size estimation. Further work will examine how this feature can be refined.

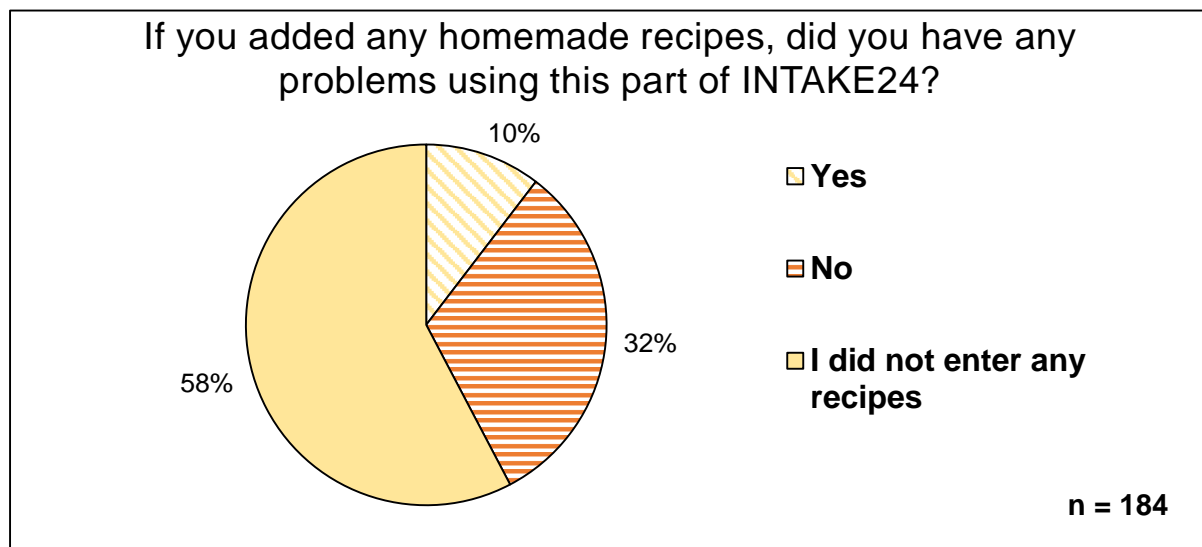


Figure 7. Participant feedback for SurveyMonkey® questionnaire

Only 15% of participants reported that they had a problem with entering a missing food item. The vast majority of participants had either no problems entering missing foods or they found no need to add any as they found all their foods in the database.

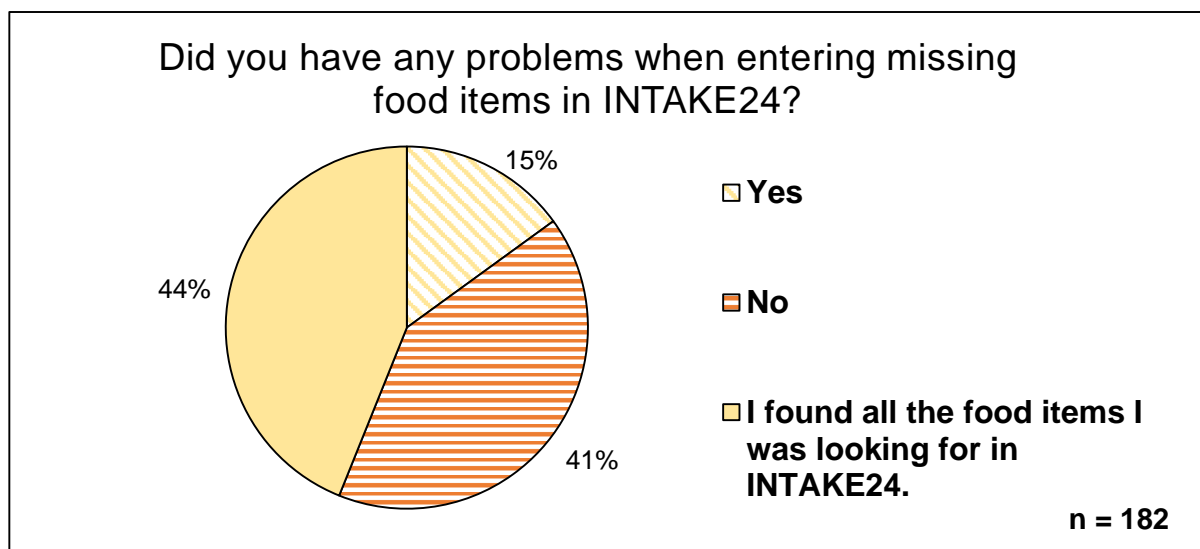


Figure 8. Participant feedback for SurveyMonkey® questionnaire

Over three quarters of participants stated that they would like to receive individual feedback on their dietary intake from their food recalls, with 25% stating that they wouldn't like to receive any feedback.

Table 35. Participant feedback for SurveyMonkey® questionnaire

In future surveys, would you be interested in receiving feedback from INTAKE24 on your diet?	
Answer Options	Response Percent
Yes	75%
No	25%
Answered question	177

At the end of the survey, participants were asked how they would like to be contacted with notification of the days and dates they should complete their recalls. The preferred modes of contact were email (53%) and text messages (31%). Phone calls were the least preferred method of contact with only 5% of participants preferring to be notified of the days to complete their recalls by phone call.

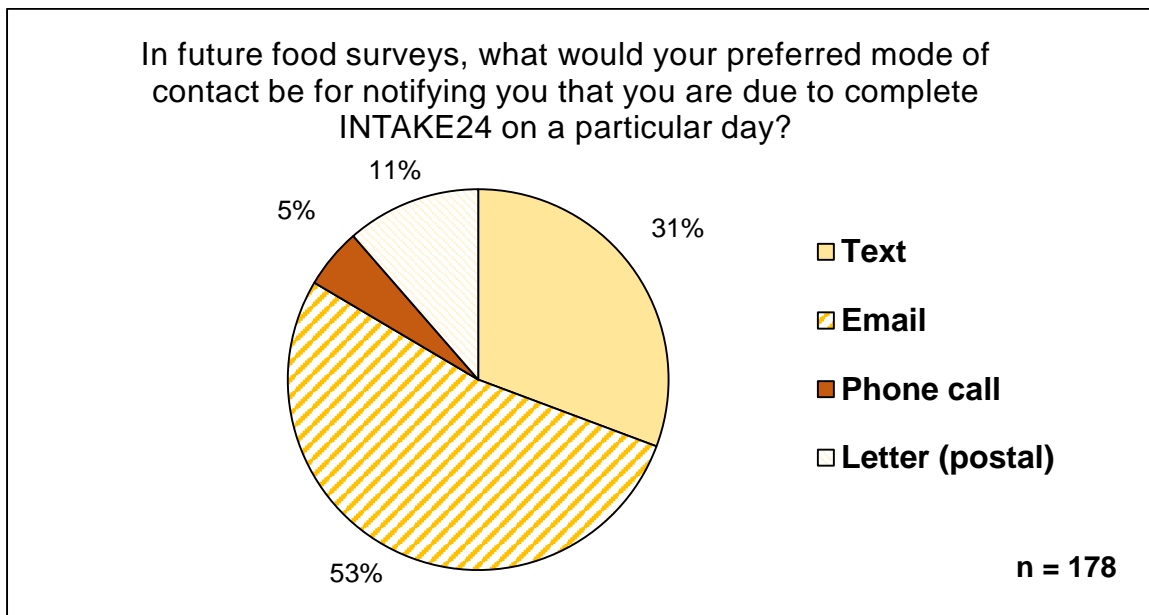


Figure 9. Participant feedback for SurveyMonkey® questionnaire

Finally, participants were given the opportunity to add free text comments giving feedback about the system overall. Responses written by participants were categorized as 'negative' if they provided only negative comments about INTAKE24, 'positive' if they provided only positive comments, 'neutral' if they gave a comment that was neither positive nor negative and 'mixed' if there was mix of both positive and negative feedback. The highest scoring answer group was 'positive' with over 40% of answers in this category. Combining the mixed and positive responses shows that around 50% gave a positive comment, and combining the mixed and negative responses shows that 25% gave a negative comment.

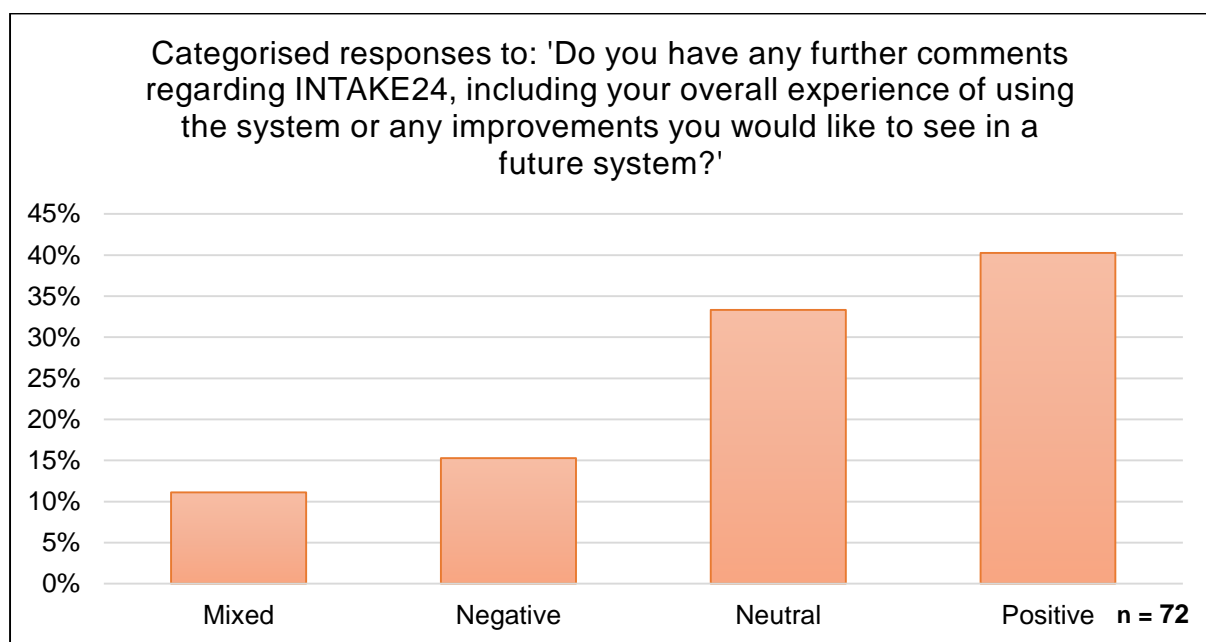


Figure 10. Participant feedback for SurveyMonkey® questionnaire based on 72 answers

Examples of comments included;

- Mixed: *"I thought it was very visual and easy to pick up but it took me longer (than) I would of liked"*.
- Negative: *"The site kept on crashing as I tried to enter my food diary which made it a bit time consuming..."*.
- Neutral: *"I hope my input helps. Thank you for your patience"*.
- Positive: *"I enjoyed using the system and felt it was well designed overall"*.

8.1.3 Field visit participants feedback

Four participants had a field visit whereby an interviewer visited the participant and showed them how to complete the recall. The interviewers also asked the participants to complete similar questions to those completed by the other participants via SurveyMonkey®.

It was shown that three of those who had a field visit *disagreed* with the statement 'I didn't feel very confident using INTAKE24'. Three people also *disagreed* with the statement that 'INTAKE24 was unnecessarily complex'. Two of the participants *disagreed* with the statement 'I thought there was too much inconsistency in INTAKE24' and the other two *neither agreed nor disagreed* with this statement. None of the participants *agreed* with this statement. Three of the participants *disagreed* with the statement 'I didn't feel very confident using INTAKE24' with one person *agreeing* with it.

All of the participants in this group thought that INTAKE24 had accurately captured their dietary information and three of them felt that it was easy to follow and understand. Two participants *agreed* that INTAKE24 was visually appealing while the other two *neither agreed nor disagreed*. No participants *disagreed* with this statement. Three of the participants *agreed* or *strongly agreed* with the statement 'I enjoyed using INTAKE24' with just one participant *neither agreeing nor disagreeing* with the statement. Again, no participants *disagreed* with this statement.

Two participants reported problems finding foods when using INTAKE24 which were that certain foods were not in the database. None of the participants had any problems with the portion estimation selection or the homemade recipes function. In relation to feedback on their dietary intake from INTAKE24, three out of four participants stated that they wouldn't like to receive any feedback.

8.2 Feedback from those completing only one, two or three recalls

Those who completed one, two or three recalls were contacted via email only and were sent a link to a one-question questionnaire which was made using SurveyMonkey®. All participants were asked to choose from a number of reasons as to why they stopped taking part and they were able to choose more than one response. Twenty seven people responded to this survey out of the 87 that were contacted via email, and five people responded via email with feedback, giving a response rate of 37%. The responses of those who emailed their feedback were coded into the reasons in Table 36.

Six participants didn't provide email addresses and therefore a member of the Newcastle University study team telephoned these people to enquire about the reason for the participants' only partially completing the survey. The outcomes from the SurveyMonkey® questionnaire and phone calls are shown below (Table 37). Of the six participants who didn't provide email addresses, three were uncontactable after numerous attempts to reach them by phone call, and one person was unwilling to talk.

Table 36. Reasons why all four recalls weren't completed from SurveyMonkey® questionnaire

Reason Given	Number of participants	Response Percent
Thought I had fully completed the survey	15	27%
Don't remember seeing any more emails	10	18%
Opened the mail too late to complete for allocated day	10	18%
Did not receive any more emails ¹⁶	7	13%
Away / Holiday / No (or problems with) internet access ¹⁶	5	9%
Didn't enjoy doing it	3	6%
It took too long	1	2%
Lost interest	1	2%
Unable to access the website	1	2%
Could access the website but was unable to log on	1	2%
Had enough after completing 1, 2 or 3 recalls	1	2%
Changed my mind about taking part	0	0%
Didn't like that it was online	0	0%
Base		[32]

¹⁶ Participants had written this in the free text 'other' answer option or written a statement via email

Table 37. Reasons why all four recalls weren't completed from telephone calls

Reason Given	Number of participants
Thought I had fully completed the survey	1
Changed computer and site wouldn't load	1
<i>Base</i>	[2]

8.3 Feedback from non-respondents

Participants who agreed to take part in the survey but then failed to log on and submit any recalls were called via telephone by a member of staff from the Newcastle University study team. Participants were reminded about the study and then asked for the reason they didn't complete any recalls. There were 133 participants who were in this group. Reasons were obtained from 74 participants, with 12 participants unwilling to comment. Contact couldn't be made with 47 participants after numerous attempts. Reasons given from participants were classified into groups (see Table 38 below)

Table 38. Reasons from participants for not completing any recalls

Reason Given	Number of participants	Percentage of participants
Too busy/forgot about the study	25	34%
Couldn't log on e.g. web page not working, phone broke so couldn't complete	16	22%
Been away e.g. holiday, with work, visiting family, ill	13	18%
Computer/Internet problems	5	7%
Found recalls too complicated	5	7%
Wasn't sent emails	4	5%
Didn't want to take part	3	4%
Didn't see emails/lost details	2	3%
Don't know	1	1%
<i>Total number of participants contacted</i>		74

9 Post Field Testing Developments

From the field testing and feedback, a number of system amendments were identified which would further improve the usability and accuracy of the system. These are detailed in the following section.

9.1 Log in function

Upon investigating the most frequent causes of failed log in attempts it was discovered that a number of participants were copying and pasting their username from the details provided and accidentally including spaces before and/or after. The username field was modified to automatically strip out any 'white space'. In addition, the password verification system was extended to handle common mistakes such as inadvertently enabled Caps Lock mode or automatically capitalised first letter (which happens fairly often on mobile platforms). This feature significantly decreased the number of failed log in attempts.

9.2 Expanding the food database

From those foods participants had flagged as 'missing' in their food recalls, and in addition, to the study team adding in other items (found by searching other food databases, recipes and many other sources), over 500 more food and drink items have been added into the database. The database can be updated and expanded as new food products are brought to market and more missing foods are identified. This should minimise the problems users have with finding certain foods.

In the present study it was found that some users had misunderstood that food items in the database such as 'Lasagne' could include both homemade and ready-made options (this is specified in a later question where the participant is asked whether any of their meals were readymade or a takeaway option). To develop the database to increase the clarity of this, many foods had the words '(includes homemade)' added to them, potentially meaning fewer participants will use the recipe function for these foods which may reduce the time taken for them to complete their recall and improve the portion size information for these foods.

9.3 Improved aspects of the system

The field testing of INTAKE24 highlighted a few aspects of the system which required alteration. Some participants added in multiple foods into 'one line' of their recall, e.g. instead of typing in 'mince' and on the next line 'potatoes' some participants were typing it in their recall as 'mince, potatoes'. The system already identifies entries including the words 'and,' 'with' and 'on' and asks the user to separate these out if they are individual food items. This

has now been extended to identify long lists with commas, &, +, numbers and forward and backslashes. In addition, the option of choosing 'milk on cereal' as a food was removed from the database and instead, this was given as a portion size option, so when a participant chooses 'milk' they can estimate it in a glass, by standard portion or by 'milk on cereal'. This should minimise the confusion participants had when adding in cereal to their recalls.

A new video tutorial was made showing aspects of INTAKE24. The new video was much shorter in length (around three minutes compared to the nine minute video made previously) and therefore is more concise. It also now includes a section on how to use the recipe function, which wasn't explained previously. In addition, to help participants use INTAKE24, a 'Frequently asked questions' (FAQ's) help page (see appendix, Chapter 15.2) was developed. This included some instructions and answers to FAQ's, including screen shots of the system. This will be made available as a link for users to click on at any time throughout their recall.

It was evident that the 'Sandwich builder' function needed to be more obvious to users as many participants typed for example 'Ham sandwich' and then only chose 'Ham' from the returned list, meaning any bread, spread or other components of the meal were not recorded. This took time to correct when carrying out the data checking. The system will be modified so that if the word sandwich, roll etc. is entered, there will be a prompt asking the participant to use the sandwich builder. This will be likely to minimise the errors in food recalls for foods such as sandwiches.

Some users commented that they had consumed more food than was in the food photographs e.g. 'I ate more chicken than the largest portion size'. Either a button will be made available so that the user has an option to state if they had a larger portion than the food photos, or a prompt asking the user if they 'had a second portion' will be made.

Feedback from the field testing highlighted that the recipe tool in INTAKE24 wasn't obvious enough to participants. Previously you had to click through a series of buttons before being able to add your own recipe. This was therefore changed to make the function more obvious to participants. To try and ensure that participants don't use the recipe function when an appropriate food which is already in the database could be used, a message *"Our database includes many homemade dishes as well as shop bought foods, please use these. If your dish isn't in the database you can add a recipe here"* will be added to the system.

Due to the large proportion of users who stated they would like to receive feedback on their dietary recalls, it was decided that a dietary feedback feature would be developed to provide general dietary information based on the foods and drinks entered in a recall.

10 System analytics (chief author – Ivan Poliakov)

INTAKE24 was updated to collect fine-grained usage statistics both on the client and the server side. The system currently uses Google Analytics together with custom client and server logs to gather various statistics, as explained below.

10.1 Google Analytics

Google Analytics (GA) is a tool used to measure website traffic and generate reports based on custom variables making it easier to understand user engagement of the system. It is the most widely used analytics tool on the internet.

GA is used for two purposes in INTAKE24. The event tracking feature of GA is used to collect statistics on how often specific features of the system are used, for instance what percentage of users report a missing food and which prompts cause the users to click the contextual help button most often. This is necessary to identify features that need further development (or, conversely, features that are not used very often and therefore should have lower development priority), and what parts of the system cause most confusion.

There were 840 surveys submitted, and the missing foods button was clicked on 173 times with a total of 96 missing dishes/foods reported. Forty-four of these were chosen as home recipes. This equates to around 5% of all submissions which were a "home recipe", and around 20% which had missing foods. The contextual help button was used 174 times (so about 20% of users used it), and only four people requested human assistance (according to GA). The team only received three help requests meaning that for some reason one person's help request didn't reach the server which is likely to be due to a network glitch. The help button on the guide prompt is still by far most frequently used (second is the meal time prompt and the third is the food search prompt).

The other important feature of GA is to identify platforms (mobile vs. desktop), operating systems and browsers that are used by the target audience in order to ensure that browsers used by a significant portion of the user base are well supported.

The most popular browsers by far are still Chrome and Safari, third and fourth are recent versions of Internet Explorer (IE) (10 and 11). Only a few (three-five) people tried to use IE8. Sixty-six % of users are logging in from laptops or desktops, 22% are using phones and 11% are using tablets.

Considering these statistics, it makes sense to drop support for IE8, which is currently the lowest version of IE supported by INTAKE24, going forward. Poor support of modern web standards in IE8 causes a lot of development effort to be spent on working around IE8 specific

bugs and idiosyncrasies which could otherwise be aimed at improving the base system features.

The video tutorial had 189 views in total, although a proportion (estimated to be around 25-50%) were from the university study team.

10.2 Server-side logs

In addition to logging critical errors, the system now also logs normal events such as successful survey submissions and failed log in attempts. Recording failed log in attempts allows identifying users that are unable to access the system due to mistyped user names and/or password. This feature was very useful in identifying common causes for unrecognised passwords which are now handled by the password verification system.

10.3 Client-side logs

A very detailed log of client-side system behaviour is collected during the survey, such as exactly what sequence of prompts was shown to the user, why those specific prompts were selected (i.e. which prompt rules were applicable and which were not), which items from the food list were clicked by the user and so on. This log is stored in the database together with the survey data on survey submission, and this data is used to identify problems in the client-side system logic, such as, for instance, prompts not being triggered correctly or user actions not being handled properly by the system.

11 Details of help requests (chief author – Emma Simpson)

A total of 14 help requests were logged via the support email provided and three participants requested a phone call from the study team. Table 39 (below) shows the reasons for requesting help and those requests that were resolved. Only two out of the 17 help requests were unresolved and all other requests were resolved quickly – within ten minutes). The first unresolved issue was in relation to an individual not being able to add crackers to her recall successfully. A member of the study team talked the participant through how to delete and re-enter a food, however there still appeared to be some confusion and the participant wasn't able to re-add their food. The second unresolved issue was related to log in details and an error message – the participant was unable to log in and a pop-up message 'wait a moment' continued to appear and a connection was never established.

Issues that were easily resolved included confusion over which days to complete with one participant worried that he had missed the opportunity to complete all four days and another participant who completed days other than those which they had been assigned – both participants were happy to complete extra days to finish the study. One participant was going away on holiday and wanted to change the dates of their recall so the study team arranged alternative days. Issues relating to logging in were the most frequently reported problems, although these were easily resolved as in many of the cases, the participant had forgotten their username or password. Another issue relating to the adding of foods into INTAKE24 included a participant entering 'nil' for drinks instead of leaving the option blank. The majority of all help requests were via the support email service.

Table 39 Help request reasons from participants.

Reason for help request	Resolved (%)	n=
Confusion of days to complete	100%	2
Wrong password/unable to log in	90%	10
Problems adding foods/doing recall	80%	5
<i>Base</i>		17

12 Discussion (co-authored – Maisie Rowland and Shanna Christie)

This chapter discusses findings based on the field test including the response to INTAKE24 and a comparison of response rates amongst participants of different ages, gender, SIMD and BMI. As part of this, the challenges and issues identified during the field test are presented. The implications that these challenges and issues have for introducing INTAKE24 as part of a large-scale survey are also discussed. Discussion of the analysis of the dietary data from the recalls is also provided.

12.1 Response and completion rates

Of the sample that were contacted and classed as eligible to take part in this study 34% completed at least one INTAKE24 recall, while 20% completed four recalls or more. The response rate was lower than anticipated although this could be partly attributed to the different recruitment and chasing strategy used in the field test.

As anticipated the response and completion rates differed by age and area deprivation with lower response rates in the sub-sets of the population in which digital technology adoption and frequency of use is known to be low (older adults and those living in the most deprived areas). There is also some indication that response to the field test was lower among those that were classified as overweight or obese.

12.2 Challenges and considerations

The challenges and considerations associated with the administration of the INTAKE24 field test are discussed here. Three particular challenges were identified from the outcomes of the field test, although it should be noted that this project was a field test and not integrated as part of a full survey. If INTAKE24 was used in a full survey it would be delivered differently and hence these challenges were not necessarily unexpected. These challenges were:

- Low overall response to INTAKE24
- Low full completion rates (i.e. four recalls)
- Low response rates among certain groups

These challenges are discussed more fully below along with possible solutions. It should be noted, however, that possible solutions that could be introduced to improve response rates may have implications in terms of overall costs and/or quality of data and therefore cannot necessarily be viewed solely from an administrative perspective.

12.2.1 Assessing the overall response to INTAKE24

The aim of this study was to test the tool in a sample of people aged 11+ living in Scotland, and it was not designed to be a full dietary survey. However in terms of boosting response to INTAKE24 were it to be rolled out, it is important to consider the possible reasons, from an administration point of view, as to why the response rate in the field test was relatively low. The possible reasons for the response rates observed were:

- No face to face interviewer contact
- Minimal interviewer input in terms of 'selling' the study and encouraging participation
- One-off study with limited public awareness
- Study engagement largely dependent on self-motivation of participant (i.e. in terms of checking emails/texts)
- Reliance on access to the internet and device connected to the internet
- Time lag from initial SHeS survey (up to two years) as well as initial contact via text/email
- Securing only parent/carer agreement for selected child to take part
- Relying on getting contact details via initial telephone contact with a risk of mis-recording (rather than participant inputting own details via computer).
- Lack of personal benefit or interest from study completion

Some of these reasons could be addressed if INTAKE24 was incorporated into a large existing study. Considerations for how they could be addressed are discussed below.

Minimal interviewer input in terms of 'selling' the study and encouraging participation

If INTAKE24 was introduced on a large-scale survey it is recommended that a face-to-face interviewer should inform participants about INTAKE24 and encourage them to take part. It is possible that this would have a positive impact on response rates. During the field test of INTAKE24, telephone interviewers achieved an overall response rate of 57% agreement to take part among those that they managed to contact (and were eligible). A face-to-face interviewer that has developed a degree of rapport with the selected participant is likely to achieve a higher response rate both in terms of gaining agreement as well as the participant completing their recall. Consideration would need to be given to how much time an interviewer would take to explain the study and secure participation as this would have an impact on costs of the existing study as well as interview length. It is estimated that this would take approximately ten minutes per participant. It is expected that this would vary depending on the participant's familiarity with using the internet and associated devices as those with less experience may benefit from being given a demonstration of how INTAKE24 works. Additional testing of this approach would be needed to confirm an average time per participant.

The possibility of an interviewer giving a brief demonstration of how to complete INTAKE24 on the participant's device while they are introducing the study in a face-to-face setting should also be considered. This could be particularly useful if participants are not very confident using information technology or have concerns about how complex the recalls are to complete. However the feasibility of this in terms of costs and interview length would also need to be assessed.

One off study with limited public awareness

As the INTAKE24 field test was a one-off study conducted largely over June and July (a peak period for summer holidays in Scotland) with a comparatively small sample there was little that could be done in terms of raising the profile of the study and generating a brand for the survey which would help raise awareness among members of the public. While there was a degree of branding of the materials for the field test it is recommended efforts are made to raise awareness among the public if INTAKE24 was to be rolled out.

Study engagement largely dependent on self-motivation of participant (i.e. in terms of checking emails/texts)

During the field test of INTAKE24 there was a minimum level of encouragement from an interviewer to engage in the research after the initial telephone call with a telephone interviewer. Participants were asked to complete the recalls via email and text notification. While this is a cost effective method involving minimum resources, it is recommended that some additional input and encouragement from an interviewer could be included to help increase motivation of participants to take part. While *maintaining* engagement with the study is discussed below in relation to completing the required number of recalls, initial engagement is also crucial as despite 57% of participants agreeing to take part, only 60% of those people actually went on to complete any recalls (resulting in an overall response rate of 34% of those eligible).

Four possible additional approaches in terms of contact could be taken to help encourage, motivate and remind participants:

- **Additional reminder e-mails or texts** - Two reminders could be sent on each recall day – with this approach currently being used for the dietary recall questionnaire on the British Cohort Study 70.
- **Personalised notification/reminders** - Notifications and reminders could include the name of the interviewer who conducted the original interview. As the interviewer would have had the opportunity to build up rapport with the participant this could motivate participants to complete the recalls.

- **Telephone reminders** - As this is more expensive than text/email it could be focussed solely on participants that have failed to login and complete their first recall after agreeing to take part and this would address some possible concerns with relying solely on electronic communications (wrong contact details, messages going in to junk mail etc.).
- **Interviewer visits** – This would allow any issues and concerns that the participant had to be covered in depth. However, it is very likely that the significant cost of this option would outweigh the possibly marginal benefits. It is anticipated that many of the issues and concerns could be addressed when the interviewer first introduces the study.

Reliance on access to the internet and device connected to the internet

The online nature of the study needs further consideration in relation to how people without access to the internet are included. Although only small numbers of people (approx. ten %) were excluded at the telephone recruitment stage from taking part because of lack of access to the internet, the feedback from non-respondents suggests that some people were affected by temporary lack of access to the internet. Also some people that requested a field visit did not actually have access to the internet and were therefore not able to participate in the study (although did agree). It is recommended that were INTAKE24 to be included as part of an existing study both a standalone version of INTAKE24 could be available so that participants can complete the first recall as a minimum with an interviewer (on an interviewer's device) as well as a telephone recall option with a telephone interviewer completing the recall with the participant over the phone (a set of cards with the portion sizes would need to be left with the participant if the recall was to be completed over the phone). There would be cost implications with this approach and possible data quality issues would need to be examined.

Time lag from initial SHeS survey (up to two years) as well as initial contact via text/email

There are two issues relating to time lag as part of the INTAKE24 field test. The first issue is due to the sampling frame used for the field test. Previous SHeS participants that had agreed to be re-contacted for further research were sampled. The time lag between participants taking part in the SHeS interview and being invited to take part in the INTAKE24 field test could have been up to two years. It is possible that some people had forgotten about taking part in SHeS or changed their minds about engaging in similar research. This would not be a problem if INTAKE24 was introduced on another study, as it is recommended that it be introduced at the end of the main study interview. It would be necessary to consider how best to minimise the time lag between a participant agreeing to take part and receiving their first notification or subsequent notification to complete a recall(s).

The second time lag issue relates to the delay between participants being contacted by the telephone interviewer and agreeing to take part to then being notified of their first recall (up to 13 days). The main issue with this is that the participant may have forgotten that they agreed to take part or lost interest and therefore stopped regularly checking their mobile/email. It is recommended that a participant does not wait any longer than three days, if at all, from being invited to take part and being invited to complete the first recall.

Securing only parent/carer agreement for selected child to take part

As highlighted in Chapter 6, despite a high agreement rate for participants aged 11 to 15 years at the telephone recruitment stage (81%) only 46% of those eligible in this age group went on to complete any recalls. A likely reason for the low rates of participation in the recalls among this age group is because of the field test study procedures for contacting participants under the age of 16. If the participant was under the age of 16 all contact about the study was through the parent/carer. This included the introductory letter, telephone recruitment stage and email/text notifications (although a leaflet was provided for the child). This was mainly due to ethical considerations about contacting children of this age directly and also because it was their parent/carer that agreed for them to be contacted about further research as part of the SHeS interview. It is possible that response among those aged 11 to 15 years would be higher if the study was introduced to both the child and the parent/carer at the same time and the child's email address and or mobile phone number was used to contact the child directly. It would be necessary to consider children's access to mobile phones and email accounts as well as the acceptability of this among both parents/carers and children themselves.

Lack of personal benefit or interest from study completion

Personal participation in the test of INTAKE24 is likely to have depended largely on either the goodwill of potential participants and/or an interest in the subject matter or, possibly, the web tool itself. As 75% of individuals taking part in the field test indicated that they would be interested in receiving personal feedback on their dietary intake providing personalised information on how the individual's diet compares with dietary recommendations may encourage participation. It should be noted that providing this at the end of the fieldwork period (rather than after each individual recall) would mean that feedback was provided on a more robust measure of their dietary intake i.e. more than one day and would mean the feedback would not result in changes to their dietary intake before the end of the assessment period.

12.2.2 Low full completion rate for four recalls

As outlined above, completion rates for those finishing the required four recalls were lower than expected with only 20% of those eligible to take part completing at least all four days (34%

of those that agreed to take part went on to complete at least four days). Based on these findings, it is recommended that an additional reminder is introduced on the recall day in the evening in case participants check their phone/email in the morning but forget to login at some point that day.

Consideration should also be given to asking participants to complete fewer days as this would potentially reduce participant burden and encourage them to fully participate. Fewer recalls would mean sample size would need to be increased. The exact sample size required would depend on the aspects of diet of interest and the margin of error which would be deemed acceptable. This would need to be assessed in terms of comparability with other surveys, in terms of the implications on the quality of data (whether reducing to two days impacts positively or negatively on accuracy of information) and in addition, cost would have to be assessed. From the dietary analysis obtained, it is likely that asking participants to complete just two recalls would provide adequate nutritional information. This would also be less burdensome for the participants. Two non-consecutive dietary recalls were recommended by the European Consumption Validation Project for adults and children over seven years [13]. In addition, two-four recalls have been shown to be better than an FFQ for estimating usual intake of all but those food groups which are rarely consumed [6].

Furthermore, it is recommended that other incentive options (i.e. dietary feedback or an increased incentive amount, the current field test offered a £20 Post Office voucher for four recalls) are considered and that these are administered as close as possible to the final INTAKE24 recall.

12.2.3 Low response rates among certain groups

As shown in Tables 19 to 21, response to INTAKE24 was very low among certain groups namely:

- Older people (aged 65 and over).
- Those living in the most deprived areas.
- Those classed as overweight or obese.

Among those aged 65 and over only 14% of those that were eligible to take part completed any recalls compared with 40-46% of those in the other age groups (ages 11-64). Only 24% of people living in the most deprived areas in Scotland (quintile 1) completed any recalls compared with 44% in the least deprived areas (quintile 5). Also people in the sample classified as obese were the least likely to have completed any recalls (25%). However the base sizes were particularly small for some of the other BMI groups in the analysis.

It is likely that some of the measures discussed in relation to overall response (particularly alternative methods of completion such as telephone recall or face-to-face recall and more interviewer input) could help to improve response among the groups with lowest levels of participation. However the extent these measures would have on response rates among these groups is unknown.

An additional possibility to maximise the chance of getting complete recalls is to ensure that each participant has pre-allocated additional days to complete if they miss any of their original recalls. For example, a respondent who misses their second recall would already be set up to be sent reminders asking them to complete the same day on the following week (in the field test they weren't sent a reminder as such but would receive notification to complete their third recall – this could have had a negative impact as some people may have not completed any further recalls thinking that they wouldn't have been eligible for the incentive). This is likely to be a relatively cost-effective means of increasing the number of recalls that are completed.

12.3 Reported energy and nutrient intakes and food groups

12.3.1 Comparison of energy intakes with the National Diet and Nutrition Survey 2008/09-2011/12 and the Low Income Diet and Nutrition Survey 2007

The average energy intakes based on those completing four recalls were 1834 kcal per day for males and 1570 kcal per day for females after data quality checks were applied. For energy intakes based on two recalls, males reported intakes of 1926 kcal per day on average and females reported 1654 kcal per day on average. Although the reported energy intakes are not directly comparable to other studies, due to this project being a field test of INTAKE24 and not a national survey, the reported energy intakes of some studies are shown to check that the findings are around what would be expected.

It was found that the nutrient intakes reported in the field test are similar to those intakes reported in the NDNS 4 year rolling programme and the Low Income Diet and Nutrition Survey 2007 (LIDNS) data (see Table 40). It should however be noted that in the NDNS executive summary [11] it is stated that previous doubly labelled water studies (the gold standard method for estimating energy requirements) have shown that energy intakes are under-reported in the age groups of 11 years and above. It is therefore likely that intakes in the present study are under-reported to some degree.

Table 40. Average reported energy intakes from the National Diet & Nutrition Survey 2008/09-2011/12 rolling programme and the Low Income Diet & Nutrition Survey 2007

Age group	n=	NDNS 2008/09-2011/12 reported energy intakes (Average intake of male and females)	n=	LIDNS 2007 reported energy intakes (Average intake of males and females)	Age group	n=	INTAKE24 Field Testing reported energy intakes (Average intake of males and females completing 4 recalls)
11-18 Years	1497	1771 kcal/day	415	2045 kcal/day	11-16 Years	41	[1699] kcal/day
19-64 Years	2697	1862 kcal/day	1991	1861 kcal/day	17-24 Years	30	[1631] kcal/day
					25-64 Years	42	[1680] kcal/day
65 + Years	753	1723 kcal/day	805	1618 kcal/day	65 + Years	19	[1997] kcal/day
Gender	n=	NDNS 2008/09-2011/12 reported energy intakes (Average intake of those 11+ years)	n=	LIDNS 2007 reported energy intakes (Average intake of those 11+ years)	Gender	n=	INTAKE24 Field Testing reported energy intakes (Average intake of those aged 11+ and completing 4 recalls)
Male	2187	2006 kcal/day	1146	2100 kcal/day	Male	75	1834 kcal/day
Female	2760	1564 kcal/day	2065	1598 kcal/day	Female	57	1570 kcal/day

12.3.2 Comparison of the percentage energy from fat and NMES with the Low Income Diet and Nutrition Survey 2007 and with the Scottish Dietary Goals

The average intake of non-milk extrinsic sugars (NMES) as a percentage of energy intake for adults and children was 15% in the present study. In the Low Income Diet and Nutrition Survey 2007, the average percentage of NMES for children and adults was 17% and 14% respectively meaning the reported values are very similar. The average intake of fat as a percentage of energy for everyone in the present study was 33%. The LIDNS found an average percentage for men and women was 36% and 35% respectively, so values are again similar.

In May 2013, the Scottish Government released revised dietary goals for the Scottish population aiming to improve health. These goals aimed for changes to particular food groups and are based on comprehensive scientific evidence.

From the 'Fats goals', it was aimed that the intake of total fat as a percentage of food energy should be below 35%. The data from the present study shows that this goal was met as 33% of energy was derived from total fats. In regards to the 'sugar goals', it was stated that intake of NMES should be less than 11% of total food energy. From the current data it was found that this was not achieved with 15% of energy intake being obtained from NMES. Again, it must be noted that the data obtained from INTAKE24 is likely to be under-reported to some degree and that foods high in fat and sugar (e.g. snacks) may be more prone to under-reporting.

12.4 Costings

The main costs for INTAKE24 are to:

- Cover the personnel to support the dietary recall system.
- Administer the survey to participants.
- Prepare and quality check the data in preparation for analysis.

12.4.1 Personnel to support INTAKE24

This includes system maintenance and updates, support for queries and technical issues (most studies would require 24-hour response time) and nutrition support costs to cover the generation of usernames, passwords and study URLs, responding to user queries and problems, updates to the database and coding of missing foods, recipe items etc. This would involve the support of a nutrition research associate and an IT research associate for technical support. There are also minimal hosting costs. There is little difference in the cost of running a small survey in terms of supporting the INTAKE24 tool compared with a large survey except for the extra time needed for system administration and dealing with missing foods and recipes.

12.4.2 Administering the survey to participants

This includes setting up systems for gaining participation and reminders for taking part. Costs would vary depending on how this was achieved e.g. whether people are invited to take part by post, phone or face-to-face. It would be more cost effective to introduce INTAKE24 as part of an existing study and would likely yield higher response rates. The methods and number of reminders sent to participants would also effect the overall cost of administering the study.

12.4.3 Preparing and quality checking the data

This element of the study includes having the data prepared, quality checked and presented ready for analysis by a nutrition research associate.

12.4.4 Overall costs

The main cost elements highlighted above would vary depending on how INTAKE24 is administered, the length of time it is run, the number of people taking part and whether there are cost savings due to other organisations using INTAKE24 at the same time. Overall, using INTAKE24 as a standalone tool for collecting nutritional information is likely to achieve substantial savings if compared with in-depth, intensive national surveys such as the NDNS although due to the considerable methodological differences between INTAKE24 and NDNS any direct cost comparison should be taken very carefully. In particular, INTAKE24 collects solely nutritional information via a short but detailed questionnaire whereas NDNS collects nutritional information via a paper food diary as part of a wider questionnaire covering

additional topics as well as biological samples and measurements. Including INTAKE24 as part of an existing health study such as SHeS offers the potential to provide some of this wider information collected by NDNS alongside the detailed nutritional information from INTAKE24. However any assessment of the cost effectiveness of this approach in comparison to that provided by NDNS or other studies needs to take into account the full range and nature of information collected from any approach as well as the possible advantages of an innovative online tool as opposed to traditional pen and paper approaches.

12.5 Further system developments

User feedback on the system was very positive and the energy and nutrient intakes reported were comparable to those reported in national dietary surveys. Developments identified through the field test will improve the usability and accuracy of the system further, in all age groups from 11 years and over.

Through use of the missing foods function the food database can be updated and therefore will be as comprehensive as possible. In addition this will be used to identify foods which are in the database, but which users were unable to locate. Meta-data for these foods (synonyms and brand names) can also be added in order to make them easier for participants to find and therefore minimise the number of foods that require manual coding. The recipe function will be made more easily visible to users so they are able to find this and add in homemade recipes. An option for adding 'second portions' of foods in the database will also be added. Changes will be made to the sandwich builder in order to make this more obvious to users, and to try and ensure there are no more issues with people missing this. We will also explore using a separate prompt that asks users 'Do you want to make your own sandwich?'. The problems occurring with milk on cereal where users mistook a single item (cereal on milk) for the combination of both cereal and milk will be minimised as the option of 'milk on cereal' from the foods list has been removed and instead, this has been added as an option for the method of portion size estimation. As these are commonly consumed items these two changes should have a significant impact on the accuracy of the nutrient data and reduce the time taken for manual coding.

A 'frequently asked questions' (FAQs) page has been made and will be added as a link on INTAKE24 to help participants with any queries they have. A more concise video tutorial has also been made and added to the system which includes instructions on how to use the recipe tool. Around 75% of participants stated they would like to have feedback on their own nutrient intake. This will be developed and will provide the user with personalised nutritional information based on their recalls.

13 Conclusions

13.1 Recommendations for improving recruitment and completion rates in future studies

The method of using initial telephone recruitment, then subsequently sending four brief emails and/or text messages asking participants to log in and complete a recall, may be improved in future by augmenting this process with a further phone call encouraging participation and/or follow up support for those who do not log on or do not continue to complete recalls.

From the feedback given by non-completers, a substantial number of people either forgot about the study or did not see the emails, so increasing the number of reminders may also help to improve completion rates (e.g. an initial email/text asking people to complete a recall could be sent in the morning along with reminder emails/texts in the afternoon and evening). In addition personalising the notification and reminders so that they are sent from the interviewer who conducted the original interview may help engage participants. Both of these strategies may increase completion rates whilst remaining very cost effective.

A number of people reported being unable to take part in the survey due to problems logging on or issues with internet access. A small number of those who were struggling to log on (due to confusion over username and password or using the demo link) requested assistance through the '*contact us*' option on the INTAKE24 website. We were able to help these people to log on in all but two cases which indicates that a support phone call to individuals who haven't logged on could improve completion rates at minimal cost.

Finally, the field test was conducted over a two month period and around 15% of people indicated that although they agreed to take part, they were actually unable to take part due to being away, this would be less of an issue in a study of longer duration.

If used in a survey such as SHeS where an interviewer is in place in the home for a health interview INTAKE24 could be introduced briefly at the end of the interview. The interviewer could then log on, bookmark the website and demonstrate completion of one meal. This would likely take five-ten minutes and would improve completion, particularly in those groups where digital adoption is likely to be lower (over 65 year olds and lower SES).

13.2 Summary

This project allowed further development of INTAKE24 to maximise the ease of use of the system for people of all ages. Problems that arose in the field test have been addressed, existing features have been improved and new features have been added. The nutrient data obtained was found to be in line with data obtained in other dietary assessment studies and feedback on the system was very positive.

Sub-groups within the population likely to require more help or encouragement to complete recalls using INTAKE24 have been identified and strategies for boosting recruitment and completion rates have been proposed. The impact these recommendations will have on response rate is unknown and would need to be tested in a pilot study. INTAKE24 offers significant cost savings over face-to-face dietary methods both in data collection and data coding, entry and analysis. The automated coding system ensures consistency of coding and eliminates data entry errors. It must be acknowledged however, that there will be some loss of accuracy and precision compared with interviewer-led methods. Whilst the convenience and anonymity of online methods may appeal to some people who might be deterred from taking part in surveys requiring an interview with a nutritionist, there are additional challenges in motivating people to complete online methods particularly in low income populations and older adults. As use of the internet and mobile devices becomes more ubiquitous the proportion of the population requiring additional help will reduce, making online dietary assessment methods a viable alternative for collecting data from a representative sample of the population.

14 References

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15 Appendices

15.1 Food group List

Table 1. Groupings used in the food group analysis

Original Food Group Name	Field testing food group ¹⁷
White bread/rolls	6
Brown and wholemeal bread/rolls	6
Sweet breads: malt bread, currant bread	6
Other breads <8g/100g fat: bagel, chapatis (made without fat), milk bread, grilled poppadum's, pitta, rye bread, soda, flour tortillas, crumpets	6
Other breakfast cereals: muesli, bran flakes	6
Rice	6
Pasta	6
Sweet biscuits: excludes full coated biscuits	5
Cakes: sweet buns, sweet pastries, fruit scones and custard tart (sweet but not savoury based items)	5
Milk based sweet puddings: (excluding yoghurts and canned/stewed fruits) e.g. rice pudding, semolina, blancmange, custard, trifles	5
Canned/stewed fruit	1
Milkshakes: includes purchased & made from powder mix, made with all milk types	9
Bacon and ham	7
Burgers and kebabs	7
Sausages	7
Oily fish	4
Oven chips	3
Microwave chips	3
Fried chips	3
Peas: frozen, fresh, canned, dried & split	2
Other vegetables (excluding potato): carrots, green beans, pulses, cabbage, tomato base sauce, mushrooms, sweetcorn, stir fried vegetables, green salad	2
Vegetable dishes: vegetable curry, vegetable stew	2
Dressed salad dishes: potato salad, Greek salad, waldorf salad	2
Fresh fruit	1
Dried fruit	1
Sweets (non-chocolate): toffee, boiled sweets, gums/jellies, mints, liquorice, raw jelly, popcorn	5
Ice cream, ice cream desserts and lollies	5
Chocolate covered ice cream bars	5

¹⁷ Other food groups in INTAKE24 were not included in the food group analysis in this report

Chocolate: includes all plain, milk & white chocolate bars & coated bars e.g. caramels & wafers and full coated chocolate biscuits	5
Preserves and syrups: glace cherries, honey, jam, marmalade, lemon curd, marzipan, mincemeat, chocolate spread, ice cream topping	5
Table sugar: demerara, white	5
Other carbonated drinks (not diet)	9
Fruit juices e.g. fresh orange juice	8
Fruit drink, ready to drink (sweetened)e.g. sunny delight, umbongo, five alive	9
Other cordials and squashes: excluding low calorie & reduced sugar	9
Alcohol	5
Couscous, Bulgar wheat	6
Noodles and noodle dishes	6
Non meat based pasta dishes	6
Non milk based sweet puddings: (excluding yoghurts and canned/stewed fruits) e.g. meringue, cheesecake, gateaux, jelly, fruit pies (pastry), crumble	5
Pulses and lentils	6

Table 2. Key for food groupings

Field testing food group name	Field testing food group number
Fruit	1
Veg	2
Chips	3
Oily fish	4
Discretionary Items (inc alcohol)	5
Foods rich in Fibre and/or Starch	6
Red and/or processed meat	7
Fruit juice	8
Sugary drinks	9

15.2 Frequently asked questions

INTAKE24 – FAQ's

Frequently Asked Questions

How do I add foods or drinks to my recall?	2
How do I estimate the portion size of my foods?	3
How do I delete or change a meal I've already added?	5
How do I add another meal to my recall?	6
What if it shows a photo of a different food?	7
What if my food isn't there?	7
How do I add a sandwich or salad?	11
What if I change my mind about doing a recall when I've already started it?	13
What if I have to stop mid-way through completing my recall?	15

How do I add foods or drinks to my recall?

- Type a single food item in the free text box under 'Food'. Each food item should be on a **separate line**. Do the same for drink items under 'drinks'. Do **not** type any amounts of foods or drinks - **only type the food or drink name**.
- If you **did not** have a food or drink at that meal time **do not type anything**. **Just leave the box blank**.

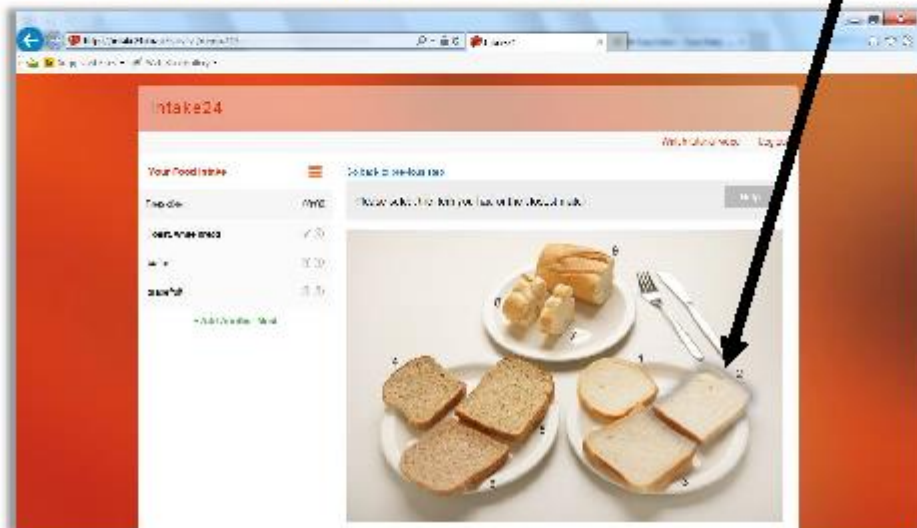
The screenshot shows the Intake24 interface for a meal named 'Breakfast (08:00)'. On the left, there is a sidebar with navigation options like 'Dietitian', 'Add', 'History', etc. The main area is divided into 'Food' and 'Drinks' sections. The 'Food' section has a text input field containing 'Tea'. The 'Drinks' section has a text input field containing 'Luscious'. Below these sections are buttons for 'Change meal time', 'Add Meal', and 'Save this meal'. A black arrow points from the text above to the 'Food' input field.

- The system has some prompts for foods that are commonly consumed together, for example, milk in tea and butter on toast. If you have already added this food/drink and then you are asked something like 'did you have any butter' you should click the button 'Yes, I already entered it'. Don't enter it again as your food will be recorded twice

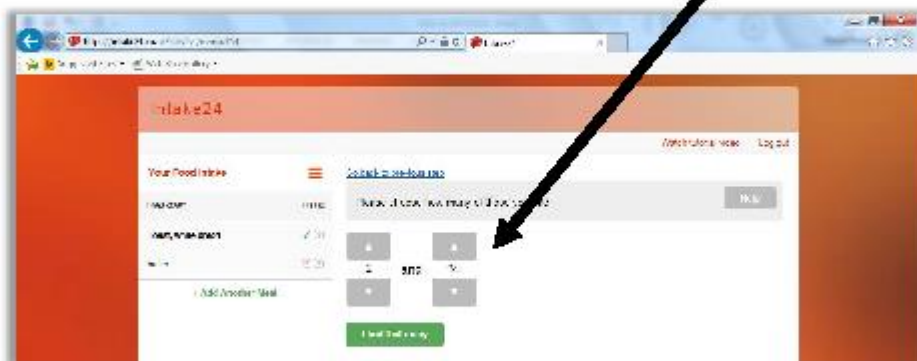
The screenshot shows a prompt in the Intake24 interface: 'Did you have any butter on top of your tea?'. Below the prompt are three buttons: 'No, all eat', 'No, had some', and 'Yes, I have already entered it'. A black arrow points from the text above to the 'Yes, I have already entered it' button.

How do I estimate the portion size of my foods?

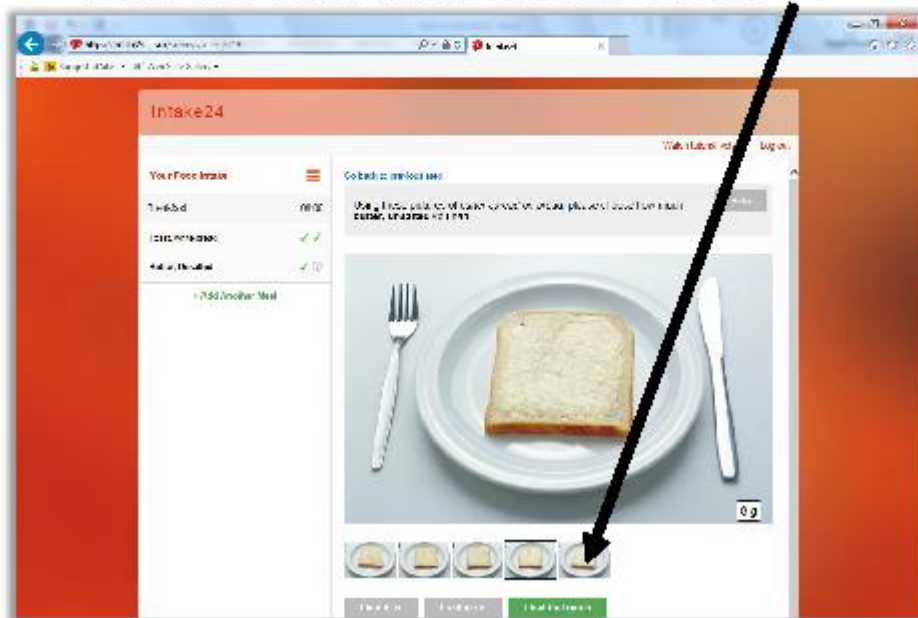
- For some foods like bread, you will be asked to choose the most similar item to the one you had. Click on the image of the most similar sized food.
- For other foods you may be asked to say the amount you had by a spoonful or by another measure. Try and be as exact as you can.



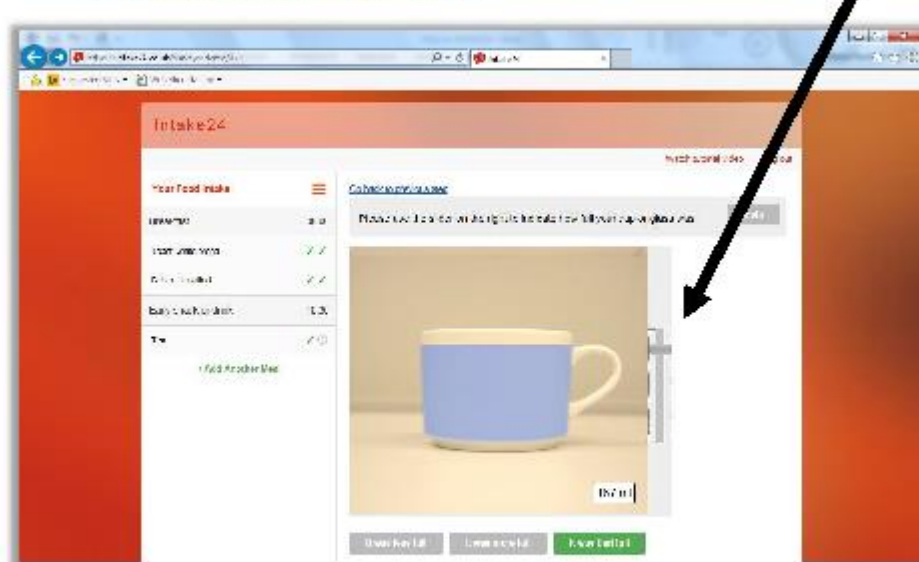
- After choosing an image or a way of estimating your food, you will be asked to choose the number you had. You can increase or decrease the amount by clicking the buttons. You are able to add amounts like half a piece of toast too



→ For foods like butter you will be shown photos with different amounts of the food in. You can increase or decrease the amounts by clicking on the different photos. Choose the image that is closest to the amount you had

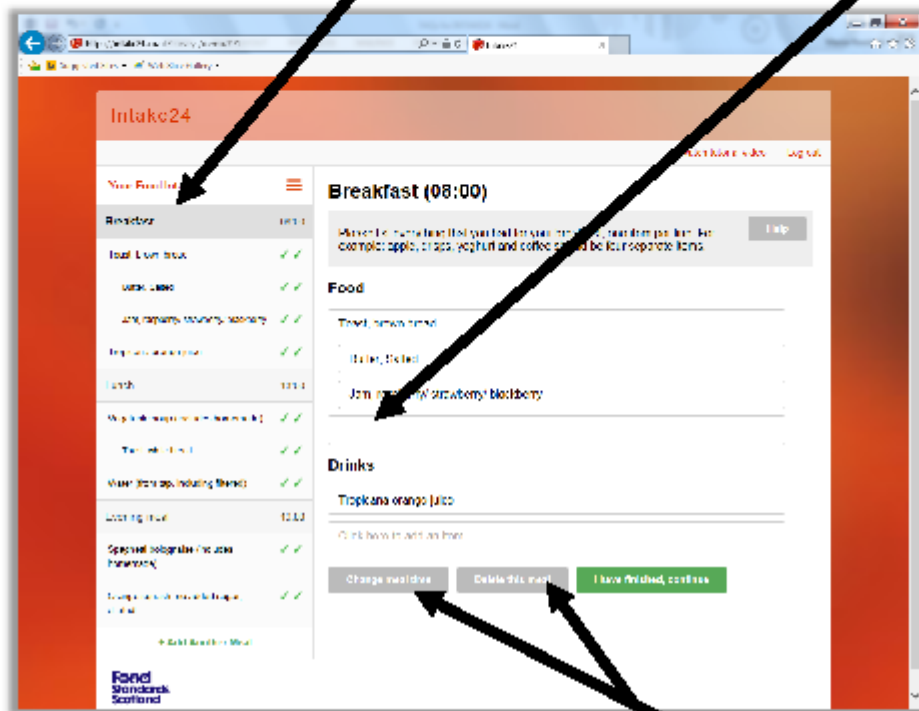


→ For drinks, you can choose the most similar shaped cup/glass or mug to the one you had. You can then fill the cup/glass or mug to the amount you had using the slider on the right hand side



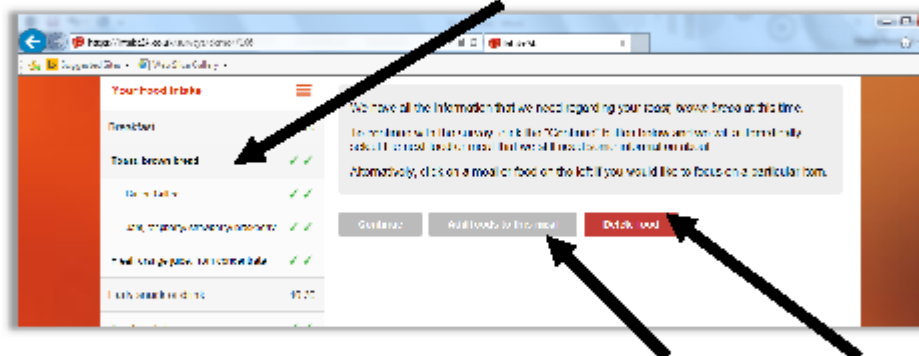
How do I delete or change a meal I've already added?

→ Click on the meal name. You can add extra foods by typing them in



→ You can delete the meal or change the meal time by clicking these buttons

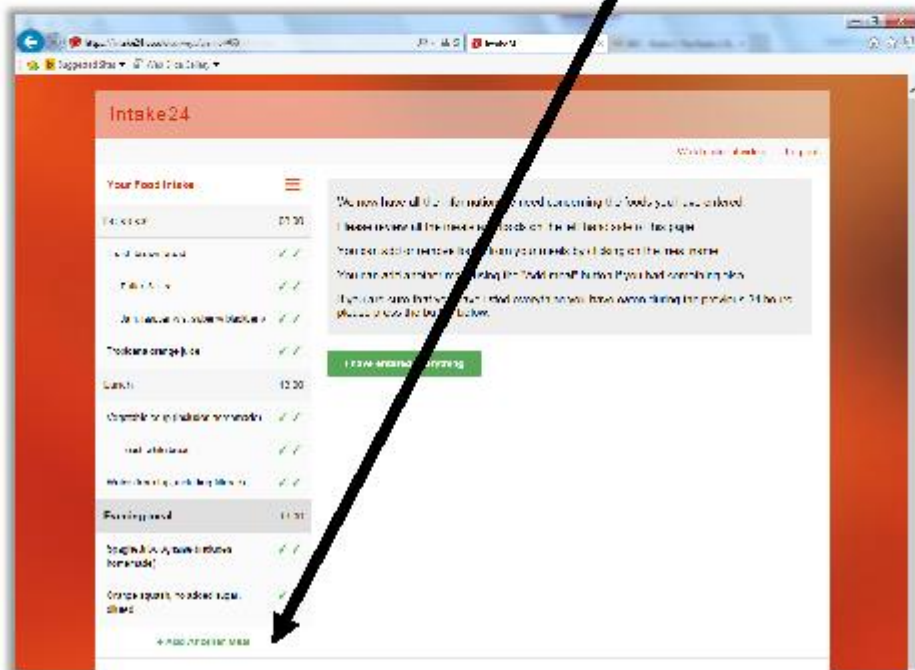
→ To change an single food, click on the name of the food



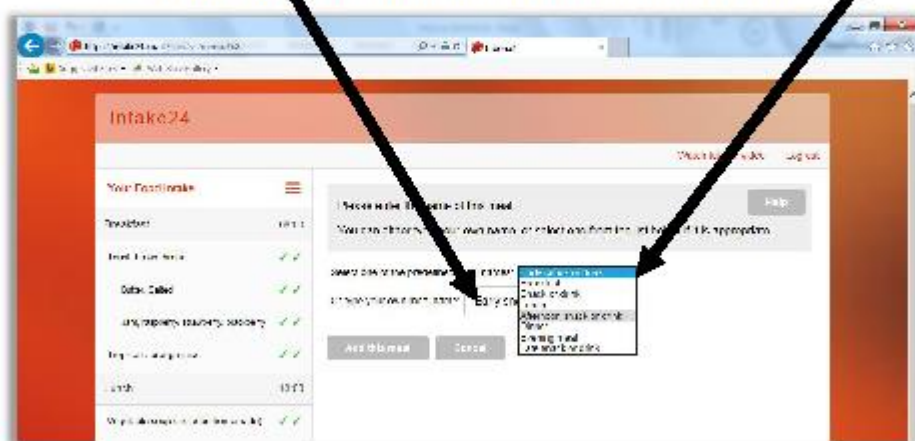
→ You can add foods to the meal by clicking 'add foods to this meal' or you can delete foods by clicking the 'Delete food' button

How do I add another meal to my recall?

- Click on the '+ Add Another Meal' button which is at the bottom left of the screen under the foods you've already added.



- Choose a meal name by clicking on the arrow to see the drop down list, or make your own meal name for example 'Brunch' by typing it in

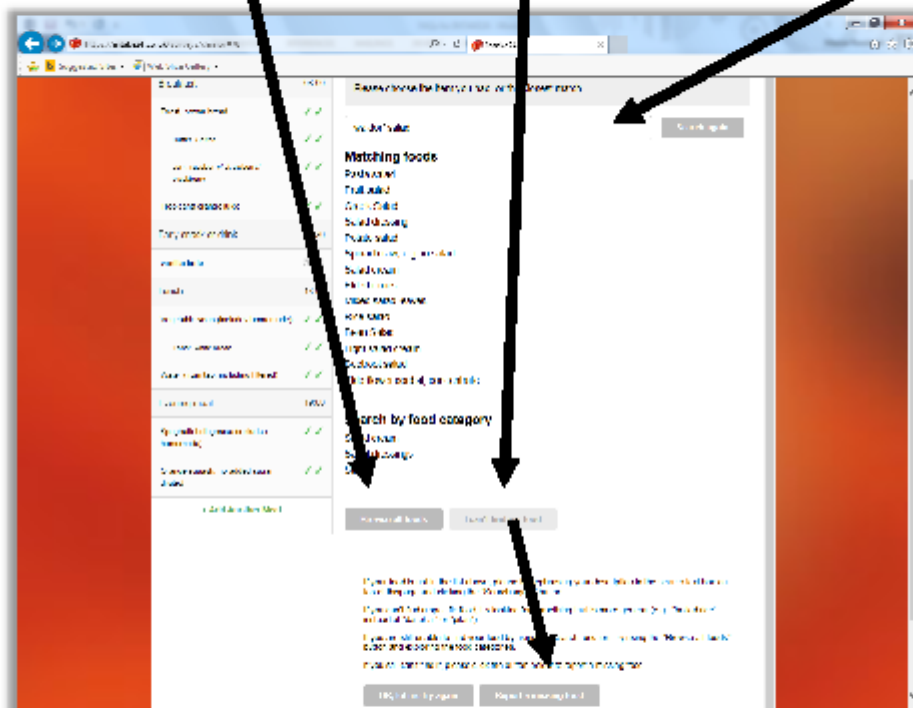


What if it shows a photo of a different food?

- We don't have photos of all foods, so for some, we will ask you to choose the amount of food you had by using a similar food. Please choose the amount which is most similar to the amount you had using these photos

What if my food isn't there?

- If you can't find your food, try rephrasing the food name or 'browse all foods'. You can click 'I can't find my food' if you still can't see it



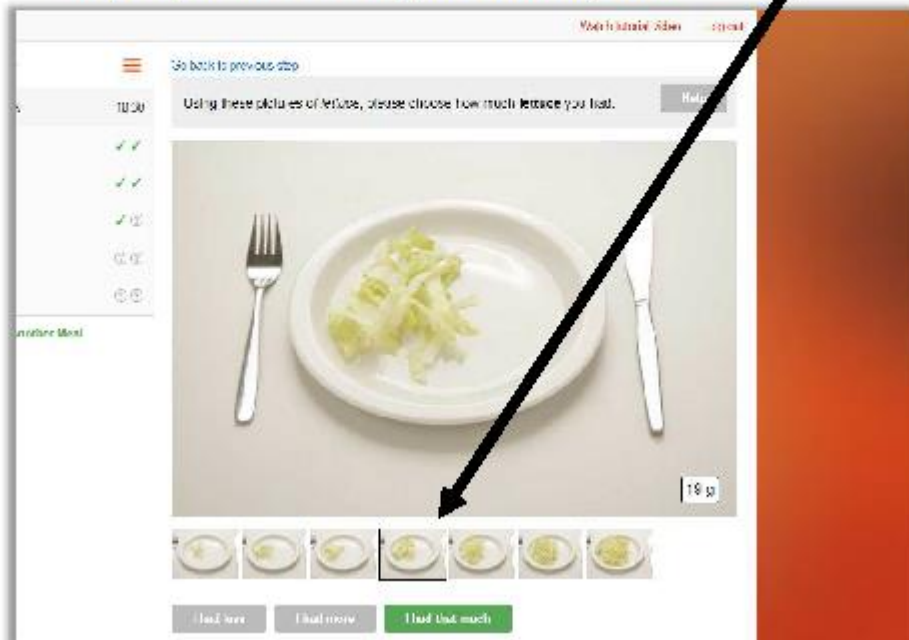
→ You can add a homemade recipe or give us details about your food if you don't know the ingredients

The screenshot shows the InTake24 website interface. On the left, there is a sidebar with a 'Your Food Intake' section containing a table with columns for 'Food Item', 'Amount', 'Date', and 'Status'. The main content area has a header 'InTake24' and a sub-header 'Add New Food Item'. Below this, there are two radio button options: 'I know the ingredients of the food I am adding' and 'I don't know the ingredients of the food I am adding'. The second option is selected. A 'Submit' button is located at the bottom of the form.

→ If it was a homemade dish add in the ingredients you used by typing them in, each one should be on a separate line.

The screenshot shows the InTake24 website interface. On the left, there is a sidebar with a 'Your Food Intake' section containing a table with columns for 'Food Item', 'Amount', 'Date', and 'Status'. The main content area has a header 'InTake24' and a sub-header 'Add New Food Item'. Below this, there are two radio button options: 'I know the ingredients of the food I am adding' and 'I don't know the ingredients of the food I am adding'. The second option is selected. Below the radio buttons, there is a section titled 'Ingredients:' followed by four text input fields. The first field contains 'chicken', the second 'rice', the third 'tomato', and the fourth 'onion'. A 'Submit' button is located at the bottom of the form.

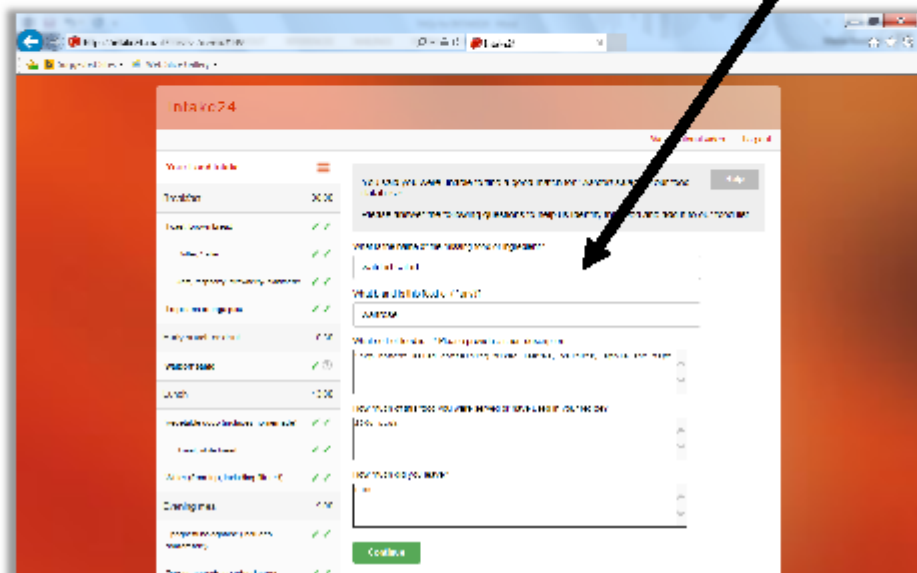
→ You can choose the amount of food you had by choosing from the images and picking the most similar image to the amount you had



→ You can also choose the amount you had by typing in a weight or a volume of the food (for example 50 grams of lettuce)



→ If it wasn't homemade, tell us as many details about your food as you can. For example, tell us the brand name or where you bought your food, the weight of pack that you had, or any of the ingredients that you know



The image shows a web browser window displaying a data entry form for a food item. The form is titled 'info-cv24' and is part of a 'New item' process. On the left, there is a list of fields with their respective values and completion status (indicated by green checkmarks):

- Weight (kg): 300
- Unit: ✓✓
- Brand name: ✓✓
- Where bought (shop name): ✓✓
- Weight of pack (kg): ✓✓
- Energy (kJ/100g): 750
- Energy (kcal): ✓✓
- Unit: 100
- Available (checklist): ✓✓
- Unit of sale: ✓✓
- Country (country code): ✓✓
- Category: ✓✓
- Preparation (recipe name): ✓✓
- Preparation (recipe name): ✓✓

The main form area contains several text input fields. A black arrow points to the 'Brand name' field, which contains the text 'JAMSW'. Other fields include 'Where bought (shop name)', 'Weight of pack (kg)', 'Energy (kJ/100g)', 'Energy (kcal)', 'Unit', 'Available (checklist)', 'Unit of sale', 'Country (country code)', and 'Preparation (recipe name)'. A 'Continue' button is visible at the bottom of the form.

How do I add a sandwich or salad?

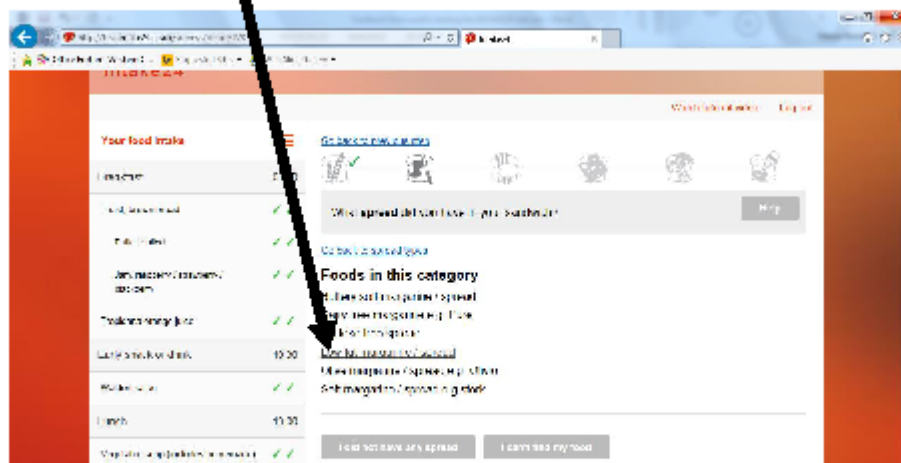
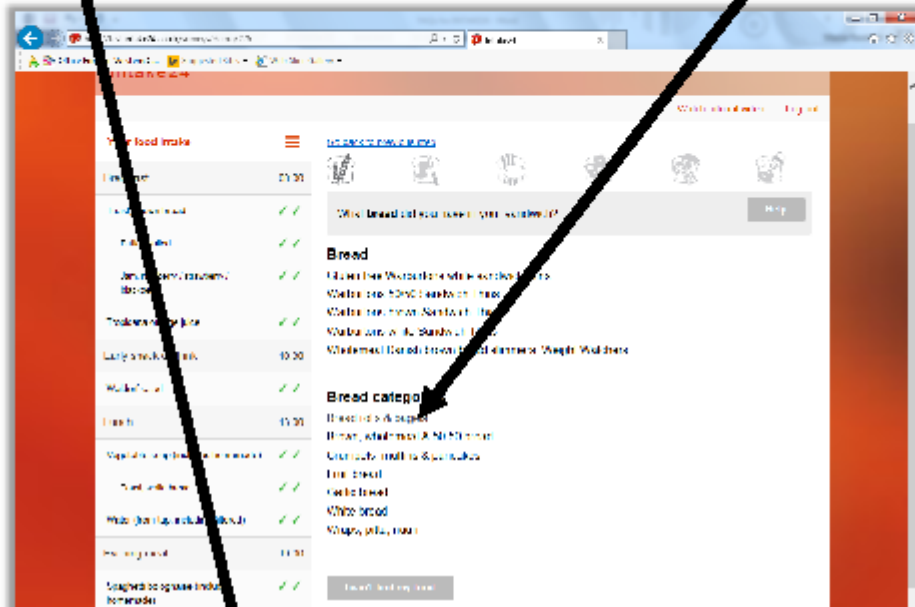
→ To add a sandwich or salad click on the 'Add sandwich' (or salad) button

The screenshot displays a web application interface with a dark orange sidebar on the left. The main content area is divided into several sections:

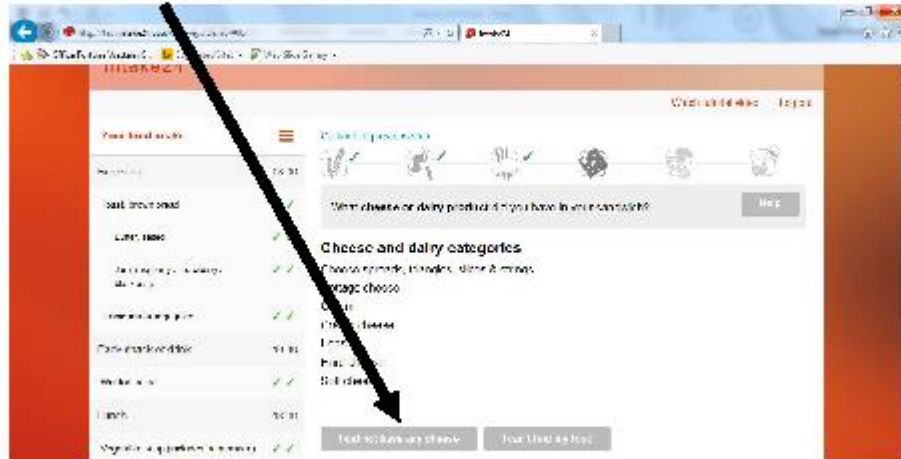
- Your food intake:** A table listing various food items with their respective quantities and status indicators (checkmarks or 'x' marks).

Food Item	Quantity	Status
Biscuit	2000	
Tuna, pouch (canned)		✓✓
Milk, whole		✓✓
Cheese, soft (cream cheese)		✓✓
Yogurt, plain, low fat		✓✓
Milk, ultra-pasteurized		✓✓
Butter, unsalted	100g	
Whole egg		✓✓
Loaf	1000	
Vegetable soup (canned, tomato)		✓✓
Hot sauce, mild		✓✓
Oil, olive (extra virgin)		✓✓
Overnight meal	100g	
Ground beef, lean (80% lean)		✓✓
Change options to added sugar		✓✓
Total kcal from diet	2200	
- Below is the list of foods from our database that match your food requirements:** A section with a search bar containing 'chicken sandwich' and a 'Search again' button. Below the search bar is a button labeled 'Add a sandwich' highlighted in grey, with a red arrow pointing to it.
- Matching foods:** A section with the heading 'Choose exactly matches to the' and the text 'Chicken legged roll'. Below this are two buttons: 'show all foods' and 'I learned my food'.

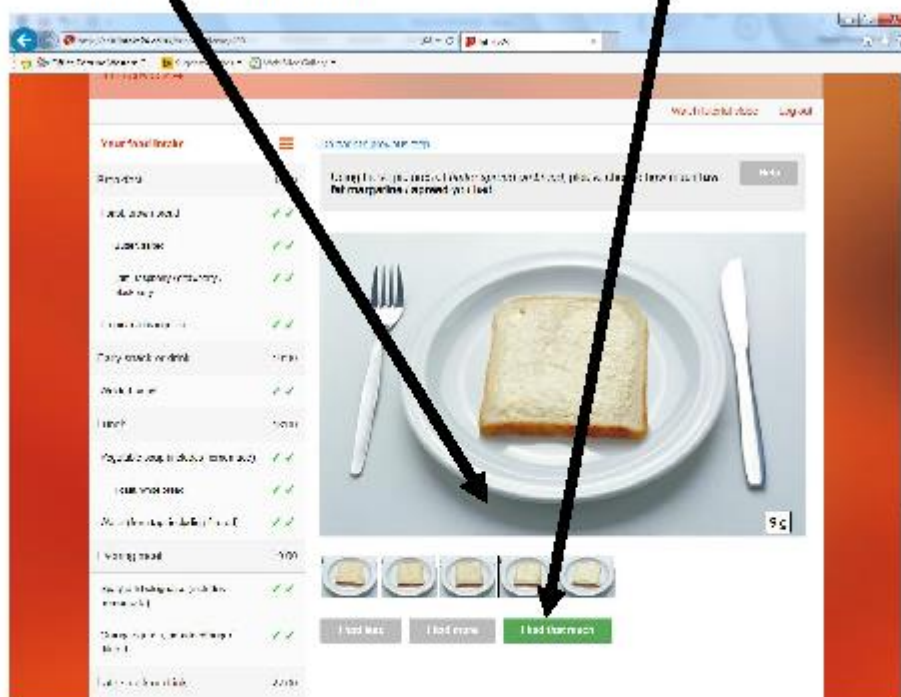
→ Choose the type of your bread, spread and sandwich fillings (or salad fillings) by clicking on the food names



→ If you didn't have a filling (like 'a cheese or dairy product') in your sandwich or salad click the 'I did not have any...' button

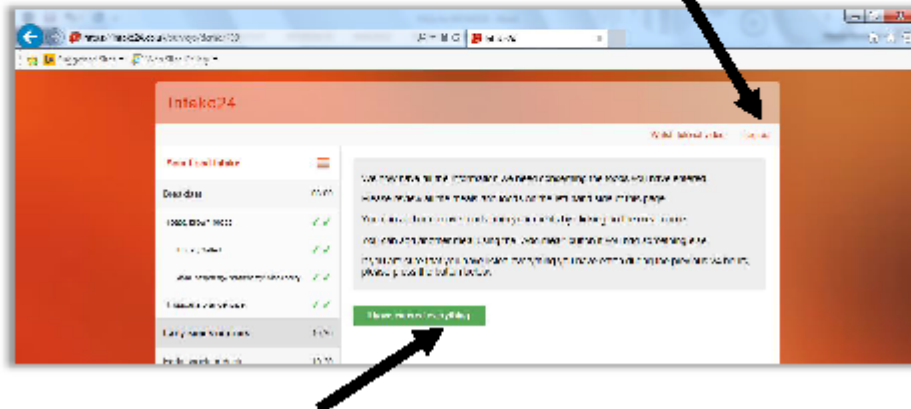


→ Choose the portion sizes of the foods in your sandwich or salad by clicking on the pictures of the foods. Click the button 'I had that much' when you have chosen the image you had.



What if I change my mind about doing a recall when I've already started it?

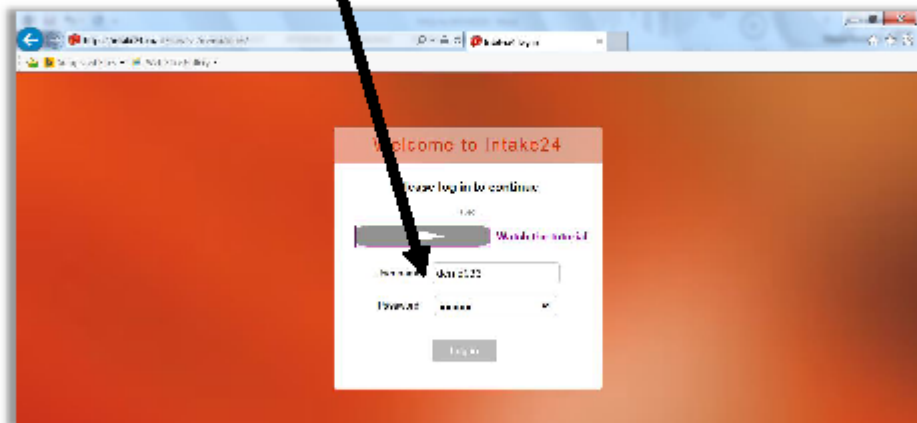
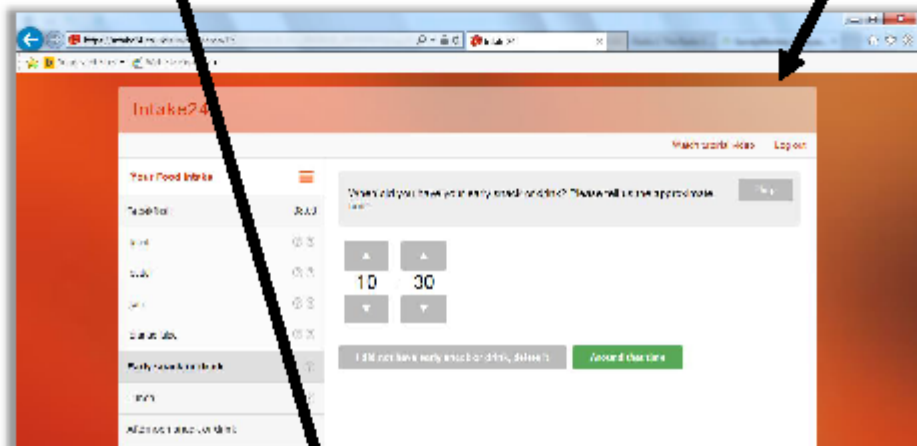
→ If you have started a recall and **you don't want to submit it**, log out by clicking the 'log out' button at the top. You can only do this if you **have not** clicked the 'I have entered everything' button



→ If you have submitted your food recall by pressing this button, you **can't go back** and change it

What if I have to stop mid-way through completing my recall?

- If you need to stop when you are in the middle of doing your INTAKE24 recall, you can log out **without submitting your recall**. You can then log **back in later** in the day when you have time to complete your recall (**NOTE - You will need to log on using the same computer or device for the food and drinks you already entered to be there**). Submit your recall when you're sure you have entered all the foods and drinks you ate and drank. Remember – you need to keep a note of your username and password which was given to you.



15.3 Telephone Unit outcome codes

Table 3. Breakdown of the codes used by the Telephone Unit

Outcomes	n=	%
Agreed to take part and provided contact info	373	37.3
Respondent not known at phone number	26	2.6
Information refused	1	0.1
No direct contact with respondent, message left	6	0.6
No direct contact with respondent, NO message left	18	1.8
Office refusal	1	0.1
Proxy refusal on behalf of respondent	22	2.2
Personal refusal by respondent (include Refusal during survey introduction)	193	19.3
Refusal during interview or break-off (unproductive partial)	2	0.2
Broken Appointment, attempted recontact unsuccessful	36	3.6
Respondent is ill at home for the duration of the field work	5	0.5
Respondent is away or in hospital for the duration of the fieldwork period	28	2.8
Respondent is permanently physically or mentally unable to take part	1	0.1
Respondent cannot take part for some other reason (lack of internet access)	53	5.3
Respondent unable to take part on phone due to communication difficulties, worth trying a face to face	11	1.1
Always telecommunication barriers e.g. call barring, call screening etc.	1	0.1
Always ringing, not answered (no answering machine)	96	9.6
Technical phone problems	2	0.2
Number temporarily disconnected or unobtainable	2	0.2
Number permanently disconnected or unobtainable	92	9.2
Refused field visit	20	2.0
Not available during field visit field work	1	0.1
Other non-response	4	0.4
Respondent moved, no new number, no info. From alternative number/stable contact	1	0.1
Respondent died	5	0.5
<i>Base</i>		1000

15.4 Study completion details

Table 4. Study completion by gender based on those that agreed to take part at the Telephone Unit stage

Completed recalls	Male as % of those agreeing	Female as % of those agreeing	P
0	41%	39%	0.741
2+	51%	51%	0.986
4+	34%	34%	0.963
Any recalls	59%	61%	0.741
Base	203	181	

Table 5. Study completion by age group based on those that agreed to take part at the Telephone Unit stage

Completed recalls	Age				P
	11-16	17-24	25-64	65+	
	% of those agreeing	% of those agreeing	% of those agreeing	% of those agreeing	
0	44%	32%	38%	47%	0.256
2+	47%	59%	50%	48%	0.378
4+	33%	40%	34%	32%	0.726
Any recalls	56%	68%	62%	53%	0.256
Base	123	81	120	60	

Table 6. Study completion by Scottish Index of Multiple Deprivation based on those that agreed to take part at the Telephone Unit stage

Completed recalls	SIMD Quintile					P
	1 (most deprived)	2	3	4	5 (least deprived)	
	% of those agreeing	% of those agreeing	% of those agreeing	% of those agreeing	% of those agreeing	
0	51%	47%	40%	37%	26%	0.019**
2+	41%	47%	53%	53%	61%	0.126
4+	26%	34%	37%	34%	42%	0.305
Any recalls	49%	53%	60%	63%	74%	0.019**
Base	86	64	81	76	77	

Table 7. Study completion by Body Mass Index based on those that agreed to take part at the Telephone Unit stage

Completed recalls	BMI classification					P
	Under-weight	Healthy Weight	Over-weight	Obese	Morbidly obese	
0	50%	36%	44%	46%	36%	0.564
2+	50%	53%	47%	49%	64%	0.767
4+	50%	39%	32%	27%	29%	0.374
Any recalls	50%	64%	56%	54%	64%	0.564
Base	6	165	110	59	14	

15.5 Examples of emails sent

We'd like your food for thought

Dear <Forename>

Thank you for agreeing to help us test out INTAKE24, the online food diary developed for Food Standards Scotland (FSS). We think you'll find it interesting and will enjoy taking part. With your feedback we can find out whether INTAKE24 is a good way of collecting crucial information about the nation's diet.

We would like you to complete INTAKE24 today

What do I do?

Today we'd like you to tell us about everything you had to eat and drink yesterday. INTAKE24 is designed to be quick and easy to use so it shouldn't take long to complete (around 15 minutes). You just need to follow these steps -

1. Visit <https://intake24.co.uk/surveys/SHeS/login>
2. Enter your username: <username> and password: food
3. Tell us what you had to eat and drink yesterday

Next steps

We'll email you to let you know when you're due to complete your next day – so please check your email regularly over the next few days. Please don't complete the diary until you've received notification that you're due to complete it. If you've already done three days then all you need to do now is complete INTAKE24 for yesterday and tell us what you think of it by completing the feedback questionnaire at the end.

Thank you

As a thank you, participants that complete INTAKE24 on four days and the feedback questionnaire will receive a **£20** Post Office voucher that can be exchanged for cash. We rely on the goodwill and voluntary co-operation of the people selected to take part to make the study a success. Participants can withdraw from the study at any stage.

Further information

For more information please call us free on 0800 526 397 or visit us at www.intake24.co.uk

We look forward to hearing your thoughts on INTAKE24.

We'd like <Forename>'s food for thought

Dear <parentname> and <Forename>

Thank you both for agreeing to help us test out INTAKE24, the online food diary developed for Food Standards Scotland (FSS). We think < Forename > will find it interesting and will enjoy taking part. With < Forename >'s feedback we can find out whether INTAKE24 is a good way of collecting crucial information about the nation's diet.

We would like < Forename > to complete INTAKE24 today

What do we do?

Today we'd like < Forename > to tell us about everything they had to eat and drink yesterday. INTAKE24 is designed to be quick and easy to use so it shouldn't take long to complete (around 15 minutes). They just need to follow these steps -

1. Visit <https://intake24.co.uk/surveys/SHeS/login>
2. Enter username: <username> and password: food
3. Tell us what they had to eat and drink yesterday

Next steps

We'll email you when <Forename> is due to complete their next day – so please check your email regularly over the next few days. Please don't ask <Forename> to complete the diary until you've received notification that they're due to complete it. If < Forename > has already done three days then all < Forename > needs to do now is complete INTAKE24 for yesterday and tell us what they think of it by completing the feedback questionnaire at the end.

Thank you

As a thank you, participants that complete INTAKE24 on four days and the feedback questionnaire will receive a **£20** Post Office voucher that can be exchanged for cash. We rely on the goodwill and voluntary co-operation of the people selected to take part to make the study a success. Participants can withdraw from the study at any stage.

Further information

For more information please call us free on 0800 526 397 or visit us at www.intake24.co.uk

We look forward to hearing <Forename>'s thoughts on INTAKE24.

Many thanks

15.6 Examples of text messages sent

Text message text

This document provides the text which should be used to notify the participant that they are due to complete the diary. There are 2 versions:

- Version 1 – adults aged 16+ (SampType – 1 [adult] or 2 [YP/Young person])
- Version 2 – parents of children aged 11-15 (SampType – 3 [child])

Version 1 – adults aged 16+

Remember to complete your food diary. Visit <https://intake24.co.uk/surveys/SHeS/login>. Your username is <username> and the password is food

Version 2 – Parents of children aged 11-15

Remind < forename > to complete their food diary. Visit <https://intake24.co.uk/surveys/SHeS/login>. Their username is <username> and the password is food

- Note that from Group 2 onwards more space was left between the password and the unsubscribe information as some participants thought that the unsubscribe information was part of the password.

15.7 Examples of Letters sent



Title Forename Surname
Address1
Address2
Address3
Address4
Address5
POSTCODE

Ref: P11672/serial/CL1

We'd like your food for thought

Dear <Forename>

We are writing to ask for your help with an important study we are carrying out for Food Standards Scotland (FSS). The study involves trying out an online food diary, called INTAKE24.



What is INTAKE24?

It's an online questionnaire which asks people to record what they had to eat and drink the previous day. We'd like you to help us find out how well it works in practice and tell us whether you think it could be improved.



How did you get my details?

When you took part in the Scottish Health Survey in <SYear> you agreed that we could contact you about further health research. Participation is voluntary but we think you'll find it interesting and enjoyable.



What's involved?

We'd like you to complete INTAKE24 on four days – on each day you'll be asked to enter the foods and drinks you consumed the previous day. You'll then be asked a few questions about what you think of it. We'll contact you soon to tell you a bit more about what's involved. We'll then send you all the details you need to take part.



Thank you

As a way of saying thank you, those who complete INTAKE24 on four days and the feedback questionnaire, will receive a £20 voucher that can be exchanged for cash at any Post Office branch.

We've answered some of the questions you may have on the back of this letter. If you would like more information, please call us free on 0800 526 397 or visit us at www.intake24.co.uk

We look forward to hearing your thoughts on INTAKE24.

Emma Fenn
Project Manager
ScotCen Social Research

Emma Foster
Principal Investigator
Newcastle University

FAQs

How do I complete the online food diary?

After we've told you more about the study over the phone, we'll send you the information you need to log on and complete the diary. It can be completed using a computer, smartphone or tablet – you just need an internet connection.

The diary needs to be completed on four days over a ten day period. To ensure we capture what people eat and drink on a variety of days we'd like you to complete the diary on both weekdays and weekend days – but don't worry as we'll let you know when you're due to complete it and you can then fill it out at a point in the day that is most convenient to you. At the very end we'll also ask you a few questions to find out what you think about the diary.

What if I do not have access to the internet?

If you're not able to access the internet then we'd still like to speak to you. Just let us know that you don't have access when we call you.

How did you select me?

We chose you from a list of people that have previously taken part in the Scottish Health Survey and who agreed to be contacted again about further health research. Just 1,000 people across Scotland are being invited to take part. We need as many as possible of the people chosen to take part to help out.

Is the information I provide online safe?

We take our responsibility to keep your personal information secure very seriously. We won't ask you to enter any personal details such as your name and address online. All the data we ask for is collected via an encrypted connection, similar to when you are shopping online.

What will happen to any information I give?

We will treat information you provide in strict confidence in accordance with the Data Protection Act 1998. Results from the study will not include any names or addresses. The information collected is used for statistical and research purposes and will only be used to inform future developments of INTAKE24.

In the future the FSS would like to use INTAKE24 to assess the nation's diet and ultimately contribute to policies aimed at helping improve the health of people living in Scotland. The information you provide will help us understand whether INTAKE24 is a good way of finding out about people's diets.

Who is carrying out the study?

Food Standards Scotland has asked the Human Nutrition Research Centre at Newcastle University and ScotGen Social Research to carry out this study on their behalf. Both Newcastle University and ScotGen are independent of government departments and political parties. For more information about Newcastle University Human Nutrition Research Centre visit <http://www.ncl.ac.uk/hnrc/> and for more details about ScotGen visit www.scotgen.org.uk

Where can I find out more?

Visit us at www.intake24.co.uk or phone us on 0800 526 397. For more information about Food Standards Scotland visit www.foodstandards.gov.scot

The study has been reviewed by Newcastle University Research Ethics Committee to protect your safety, rights, wellbeing and dignity.

Parent/Guardian

Address1

Address2

Address3

Address4

Address5

POSTCODE

Ref: P11672/serial/CL1

We'd like < Forename >'s food for thought

Dear Parent/Guardian of <Forename>

We are writing to ask for your child, < Forename >'s, help with an important study we are carrying out for Food Standards Scotland (FSS). The study involves trying out an online food diary, called INTAKE24.



What is INTAKE24?

It's an online questionnaire which asks people to record what they had to eat and drink the previous day. We'd like < Forename > to help us find out how well it works in practice and tell us whether they think it could be improved.



How did you get our details?

When your family took part in the Scottish Health Survey in <SYear> consent was provided for us to contact < Forename > about further health research. Participation is voluntary but we think they'll find it interesting and enjoyable.



What's involved?

We'd like < Forename > to complete INTAKE24 on four days – on each day they will be asked to enter the foods and drinks they consumed the previous day. We'll contact < Forename > soon to tell them a bit more about what's involved. If you don't want < Forename > to be contacted directly about the study then please let us know by calling us on the Freephone number below as soon as possible. Unless we hear from you, we'll call < Forename > in the next few days to see what they think about getting involved. We'll send them all the details if they are happy to take part.



Thank you

As a way of saying thanks, those who complete INTAKE24 on four days and the feedback questionnaire, will receive a £20 voucher that can be exchanged for cash at any Post Office branch.

We've answered some of the questions you may have on the back of this letter. If you would like more information, please call us free on 0800 526 397 or visit us at www.intake24.co.uk

We look forward to hearing < Forename >'s thoughts on INTAKE24.

Emma Fenn
Project Manager
ScotGen Social Research

Emma Foster
Principal Investigator
Newcastle University

FAQs

How can my child complete the online food diary?

After we've told them more about the study over the phone, we'll send them the information they need to log on and complete the diary. It can be completed using a computer, smartphone or tablet – they just need an internet connection.

The diary needs to be completed on four days over a ten day period. To ensure we capture what people eat and drink on a variety of days we'd like them to complete the diary on both weekdays and weekend days – but they don't need to worry as we'll let them know when they're due to complete it and they can then fill it out at a point in the day that is most convenient to them.

What if they do not have access to the internet?

If they're not able to access the internet then we'd still like to speak to them. They can just let us know they don't have access to the internet when we call them.

How did you select my child?

We chose your child from a list of families that have previously taken part in the Scottish Health Survey and where consent was provided for them to be contacted about further health research. Just 1,000 adults and children across Scotland are being invited to take part. We need as many as possible of the people chosen to take part to help out.

Is the information my child provides online safe?

We take our responsibility to keep everyone's personal information secure very seriously. We won't ask your child to enter any personal details such as their name and address online. All the data we ask for is collected via an encrypted connection, similar to when you are shopping online.

What will happen to any information my child gives?

We will treat information your child provides in strict confidence in accordance with the Data Protection Act 1998. Results from the study will not include any names or addresses. The information collected is used for statistical and research purposes and will only be used to inform future developments of INTAKE24.

In the future the FSS would like to use INTAKE24 to assess the nation's diet and ultimately contribute to policies aimed at helping improve the health of people living in Scotland. The information your child provides will help us understand whether INTAKE24 is a good way of finding out about people's diets.

Who is carrying out the study?

Food Standards Scotland has asked the Human Nutrition Research Centre at Newcastle University and ScotCen Social Research to carry out this study on their behalf. Both Newcastle University and ScotCen are independent of government departments and political parties. For more information about Newcastle University Human Nutrition Research Centre visit <http://www.ncl.ac.uk/hnrc/> and for more details about ScotCen visit www.scotcen.org.uk

Where can I find out more?

Visit us at www.intake24.co.uk or phone us on 0800 526 397. For more information about Food Standards Scotland visit www.foodstandards.gov.scot

The study has been reviewed by Newcastle University Research Ethics Committee to protect your safety, rights, wellbeing and dignity.

Parent/Guardian

Address1

Address2

Address3

Address4

Address5

POSTCODE

Ref: P11672/serial/CL1

We'd like < Forename >'s food for thought

Dear Parent/Guardian of <Forename>

We are writing to ask for your child, < Forename >'s, help with an important study we are carrying out for Food Standards Scotland (FSS). The study involves trying out an online food diary, called INTAKE24.



What is INTAKE24?

It's an online questionnaire which asks people to record what they had to eat and drink the previous day. We'd like < Forename > to help us find out how well it works in practice and tell us whether they think it could be improved.



How did you get our details?

When your family took part in the Scottish Health Survey in <SYear> consent was provided for us to contact your child about further health research. We would like to invite < Forename > to take part in this study. Participation is voluntary but we think they'll find it interesting and enjoyable.



What's involved?

We'd like < Forename > to complete INTAKE24 on four days – on each day they'll be asked to enter the foods and drinks they consumed the previous day. We'll contact you soon to tell you a bit more about what's involved. We'll then send you all the details that < Forename > needs to take part. We've included a leaflet for < Forename > - please do let them have a look at the leaflet to see what they think. If you don't want them to take part you can call us on the Freephone number below.



Thank you

As a way of saying thanks, those who complete INTAKE24 on four days and the feedback questionnaire, will receive a £20 voucher that can be exchanged for cash at any Post Office branch.

We've answered some of the questions you may have on the back of this letter. If you would like more information, please call us free on 0800 526 397 or visit us at www.intake24.co.uk

We look forward to hearing < Forename >'s thoughts on INTAKE24.

Emma Fenn
Project Manager
ScotCen Social Research

Emma Foster
Principal Investigator
Newcastle University

FAQs

How can my child complete the online food diary?

After we've told you more about the study over the phone, we'll send you the information your child needs to log on and complete the diary. It can be completed using a computer, smartphone or tablet – they just need an internet connection.

The diary needs to be completed on four days over a ten day period. To ensure we capture what people eat and drink on a variety of days we'd like your child to complete the diary on both weekdays and weekend days – but don't worry as we'll let you know when they're due to complete it and your child can then fill it out at a point in the day that is most convenient to them. You can help them if they get stuck with completing the diary. At the very end we'll also ask them a few questions to find out what they think about the diary.

What if we do not have access to the internet?

If they're not able to access the internet then we'd still like to speak to you. Just let us know that you don't have access to the internet when we call you.

How did you select my child?

We chose your child from a list of families that have previously taken part in the Scottish Health Survey and where consent was provided for them to be contacted about further health research. Just 1,000 adults and children across Scotland are being invited to take part. We need as many as possible of the people chosen to take part to help out.

Is the information my child provides online safe?

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What will happen to any information my child gives?

We will treat information your child provides in strict confidence in accordance with the Data Protection Act 1998. Results from the study will not include any names or addresses. The information collected is used for statistical and research purposes and will only be used to inform future developments of INTAKE24.

In the future the FSS would like to use INTAKE24 to assess the nation's diet and ultimately contribute to policies aimed at helping improve the health of people living in Scotland. The information your child provides will help us understand whether INTAKE24 is a good way of finding out about people's diets.

Who is carrying out the study?

Food Standards Scotland has asked the Human Nutrition Research Centre at Newcastle University and ScotCen Social Research to carry out this study on their behalf. Both Newcastle University and ScotCen are independent of government departments and political parties. For more information about Newcastle University Human Nutrition Research Centre visit <http://www.ncl.ac.uk/hnrc/> and for more details about ScotCen visit www.scotcen.org.uk

Where can I find out more?

Visit us at www.intake24.co.uk or phone us on 0800 526 397. For more information about Food Standards Scotland visit www.foodstandards.gov.scot

The study has been reviewed by Newcastle University Research Ethics Committee to protect your safety, rights, wellbeing and dignity.

Title Forename Surname
Address1
Address2
Address3
Address4
Address5
POSTCODE

Ref: P11672/serial/CL1

We'd like your food for thought

Dear <Forename>

We recently contacted you about taking part in an important study we are carrying out for Food Standards Scotland (FSS). The study involves trying out an online food diary called INTAKE24, and telling us if you think it could be improved. By participating in this study you'll be helping FSS find out if INTAKE24 is a good way of collecting crucial information about the nation's diet.

What's involved?

Taking part is easy – you just need to follow these steps:

- | | |
|---------------|--|
| Step 1 | Visit: https://intake24.co.uk/surveys/SHeS/login on the following days:
• Friday 24th July • Monday 27th July • Wednesday 29th July • Sunday 2nd August |
| Step 2 | Enter your username: <username> & password: food |
| Step 3 | Tell us what you had to eat and drink on the previous day and let us know what you think. |



How did you get my details?

When you took part in the Scottish Health Survey in <SYear> you agreed that we could contact you about further health research. Participation is voluntary and you can withdraw from the study at any time. All the information you provide will be held securely and we won't ask for any personal information online. We think you'll enjoy taking part and we look forward to hearing your thoughts.



Thank you

We appreciate people taking the time to help us. If you complete INTAKE24 on all four days and the feedback questionnaire, you will receive a £20 Post Office voucher as a thank you.

For more information please visit us at www.intake24.co.uk or call us free on 0800 526 397.

Emma Fenn
Project Manager
ScotCen Social Research

Emma Foster
Principal Investigator
Newcastle University