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The *eatwell week*:
the application of eatwell plate advice to
weekly food intake.

Food Standards Agency in Scotland Project No. S14048

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Contents	Page
List of Tables & Figures	i
Executive Summary	ii
1. Introduction	
1.1 Diet & Health	1
1.2 Dietary Messaging in the UK	1
1.3 Putting food based dietary guidelines into practice	3
1.4 Aims & Objectives	3
2. Methods	
2.1 Basis of the <i>eatwell week menu</i>	5
2.2 Food choices for the <i>eatwell week menu</i>	8
2.3 Dietary Analysis of the <i>eatwell week menu</i>	10
2.4 Supplementary information to accompany the <i>eatwell week menu</i>	11
2.5 Format of the <i>eatwell week resource</i>	12
2.6 Testing the <i>eatwell week resource</i>	13
3. Results	
3.1 Dietary analysis	16
3.2 Focus group testing of the <i>eatwell week</i>	23
4. Revisions to the <i>eatwell week resource</i>	25
5. Discussion	
5.1 Constraints imposed by the Dietary Reference Values	27
5.2 Use of TNS data	29
5.3 Understanding of the purpose of the <i>eatwell week</i>	30
5.4 Addressing barriers to healthy eating	31
5.5 Limitations	32
5.6 Post-focus group version of the <i>eatwell week resource</i>	33
5.7 Usefulness to policymakers	34
6. Conclusions	35
7. Suggestions for Future Research	36
References	37
Appendices	
Appendix 1 Summary of TNS data on top meal choices	40
Appendix 2 Draft <i>eatwell week menu</i> for nutritional analysis	44
Appendix 3 <i>eatwell week</i> nutritional analysis	46
Appendix 4 Pre-focus group <i>eatwell week resource</i>	89
Appendix 5 Consumer focus group materials	116
Appendix 6 Ipsos MORI report- Testing the <i>eatwell week resource</i>	132
Appendix 7 Post-focus group <i>eatwell week resource</i>	175

List of Tables		Page
Table 1	Target energy, macronutrient & micronutrient content of the <i>eatwell week</i>	6
Table 2	Target and actual energy, macronutrient and micronutrient composition of the <i>eatwell week</i> menu	17
Table 3	Daily Energy and macronutrient content of the <i>eatwell week</i>	18
Table 4	Daily Micronutrient content of the <i>eatwell week</i>	19
Table 5	Target and actual energy, macronutrient and micronutrient composition of the <i>eatwell week</i> menu and <i>eatwell week</i> menu ± 500 kcal/d	21
Table 6	Proportionate decreases in energy and salt intakes from the <i>eatwell week</i>	22

List of Figures

Figure 1	The eatwell plate	1
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Executive Summary

Introduction

Diet has a vital role in the health of people of all ages and in the prevention of chronic disease. Public health approaches to encourage dietary change and the consumption of a healthy diet are numerous and most rely on the provision of information in verbal and written form. Throughout the United Kingdom (UK) the principal public health tool for communicating information about healthy eating is the *eatwell* plate.

However, evidence suggests that individuals may still have difficulty implementing non-quantitative healthy eating guidance. Additional communication tools/resources are required to assist consumers in making healthier choices. The development and provision of such resources would support Government policy to improve public awareness and implementation of healthy eating messages. This resource was designed to ensure a consistent overriding message to both organisations and individuals on how to achieve a healthy balanced diet.

The overall aim of the present project was to develop and test a resource, titled the *eatwell week*, to illustrate to consumers and health professionals what a healthy balanced diet looks like over the course of a week.

Methods

Data on meals and snacks commonly consumed by UK adults (+16 yrs) were obtained from Taylor Nelson Sofres (TNS). These data guided the development of a draft 7 day *eatwell week* menu. The menu was required to meet current UK Dietary References Values for energy macronutrients and key micronutrients; to comply with portion advice on fruit, vegetables and fish; meet the SACN recommendation on red meat consumption and not exceed the target for salt intake.

The menu was based on the energy requirements of an adult woman (around 2000 kcal/d), with information included within the resource on how to increase or decrease energy intake depending on gender and level of physical activity.

Energy intake, proportion of energy from macronutrients, and micronutrient intakes were averaged over the course of the *week*, rather than on a daily basis, demonstrating the healthy balanced diet in a way which allows flexibility and variety for consumers. The draft menu comprised three meals (breakfast, lunch and evening meal) plus additional foods ('snacks').

Analysis of the *eatwell week* was carried out in Excel and used the nutrient databank from year 1 of the National Diet and Nutrition Survey 2008-2011 rolling programme. It is not implied that the *eatwell week* recommends particular portion sizes; the *week* is designed to show **one example** of a healthy balanced diet over the course of a week. Once the macronutrient composition was achieved, the micronutrient content was checked against Reference Nutrient Intakes (RNI).

The resource was presented as a 26 page, A5 sized spiral bound laminated booklet. The booklet included 7 pages divided into 4 independent sections (one each for breakfast, lunch, evening meal and additional foods/snacks). This approach allowed meal options for each day to be interchangeable, increasing the flexibility of the *week*. The front of each section showed a picture of the suggested meal with text alongside detailing the contents of the meal. The reverse gave either the recipe ingredients, more general tips relevant to that particular meal or meal alternatives. Additional information and guidance was provided to assist users in implementing the *eatwell week*, including how to achieve macro- and micronutrient intakes if energy requirements were greater or less than those shown in the *week*.

An independent research agency, Ipsos MORI Scotland, was sub-contracted to test the draft resource with consumers and with health professionals who might use it in their work. The main aim of this work was to test the appeal and effectiveness of the resource, determine the clarity and understanding of the main messages, views on the format of the resource, plus usability and acceptability.

Testing was carried out with a range of consumers in different demographic groups, with different cooking habits, in different parts of the UK. Testing with health professionals included Community Dietitians, health promotion professionals, Practice Nurses, Occupational Health Nurses and Cardiac Rehabilitation Nurses. These data were used to inform revisions to the draft resource and to guide further development of the *eatwell week* resource.

Results

Mean energy provision was 2050 kcal, 102% of the target of 2000 kcal/d. Daily energy intake ranged from 1833–2129 kcal/d. The *eatwell week* achieved all micronutrient RNI with the exception of selenium. Mean salt intake was below the maximum recommended daily intake. The target for fruit and vegetables of 5-a-day (range 5-6.7 portions) was achieved on each day of the *eatwell week*. Mean daily content was 544g (range 434-720g) and included visible portions of fruit and vegetables and those contained in composite dishes.

Reactions to the style and presentation of the resource were positive. However, health professionals in particular felt it was unclear who the *eatwell week* was intended for and what purpose it served. The content of the *eatwell week* menu was considered realistic by consumers as it contained foods they recognised and already ate. A preconceived idea had been that there would be more fruit and vegetables and fewer ‘treats’. Women in particular felt there appeared to be too much food. Consumers found the recipes simple, although preparation time may be a barrier. Lack of cooking skills was not an apparent barrier. The message of balance was poorly understood as some consumers perceived all foods in the *eatwell week* as ‘healthy’. Consumers often lacked the knowledge to make informed substitutions in the ‘week’. Among both the general public and some health professionals, there was a general perception that there was too much carbohydrate included in *eatwell week*, which is at odds with FSA messages.

Focus group data guided revision and development of the resource. Changes included re-wording the supplementary information and presenting this more concisely, provision of alternatives/substitutions for the illustrated meals and tips on modifying recipes. Recipes were also included in the revised resource. No changes were made to the foods and drinks included.

Conclusions

This project has demonstrated that it is possible to develop a menu that incorporates foods that are popular and widely consumed by British adults, which meets dietary recommendations. The use of familiar foods was received positively by consumers and the provision of simple, easy to follow recipes, may encourage people to prepare meals from scratch. This has the potential to help overcome some of the barriers to healthy eating held by the general public and encourage improvements in dietary intakes. Further research to explore the perceptions of consumers and health professionals of healthy eating messages is required before launching the *eatwell resource* for the public and health professionals.

The *eatwell week* shows promise as a resource to facilitate implementation of the principles of the eatwell plate, and supports Government priorities and policies for health.

1. Introduction

1.1 Diet and Health

The diets of many populations, including Scotland and the UK as a whole, have changed significantly over the last few decades, with diets becoming richer in high-fat, high-energy foods, while lifestyles have become more sedentary. As a consequence, chronic non-communicable diseases related to overweight and obesity are now significant causes of disability and premature death.¹ The UK and Scotland have high morbidity and mortality rates from non-communicable diseases such as cardiovascular disease^{2,3} and there has been long standing commitment from successive UK governments to improve the diet of the population and many strategies/policies have been established.⁴⁻⁷

1.2 Dietary Messaging in the UK

The principal public health tool, for communicating information about healthy eating, supported by all four UK Governments, is the eatwell plate (Figure 1).⁸

Figure 1 The eatwell plate



Department of Health in association with the Welsh Assembly Government, the Scottish Government and the Food Standards Agency in Northern Ireland

The eatwell plate is a visual representation of how different foods contribute towards a healthy balanced diet.⁹ The plate model has been tested extensively with consumers and health professionals. The plate is divided into five segments which are based on the five food groups. Each segment shows a variety of foods:

- plenty of fruit and vegetables (at least five portions a day)
- plenty of bread, rice, potato, pasta and other starchy foods (choose wholegrain varieties when you can)
- some milk and dairy foods
- some meat, fish, eggs, beans and other non-dairy sources of protein
- just a small amount of food and drinks high in fat and/or sugar

Food-based dietary guidelines for the general public reflect recommendations for nutrient intake based on advice from the Committee on Medical Aspects of Food and Nutrition Policy (COMA) and the Scientific Advisory Committee on Nutrition (SACN).

The eatwell plate is an updated version of the Balance of Good Health (BOGH) which was launched in the UK in the mid-nineties.^{10,11} The plate design was chosen following qualitative research into consumer acceptability on the presentation of such nutritional information. The main purpose of the BOGH was to inform consumers about healthy eating via the presentation of a wide range of readily available, affordable and familiar foods, as one means of enabling them to select a varied, enjoyable and interesting diet.^{10,11} In 2007 the Food Standards Agency revised the BOGH and launched the **eatwell plate**. Revisions included the addition of a subtitle, improved images, changes to some food group titles and a change to food group colours.⁷

Other visual approaches to communicate food-based dietary guidelines include the food circle, pagoda and rainbow.^{12,13} The Food Pyramid was used until recently in the USA but this has now been changed to a plate (MyPlate) which was chosen because of its association with eating and frequent use in the market place to demonstrate a healthy meal to consumers.¹⁴

There is evidence from monitoring the Scottish diet that the population does not consume a healthy balanced diet. A review of the Scottish Diet Action Plan reported little improvement in food and nutrient intakes between 1996 and 2005.¹⁵ Recent analysis of Scottish household food and eating out data for 2001-2009 confirmed that little improvement has been made towards the achievement of the Scottish Dietary Targets.¹⁶ UK National Diet & Nutrition survey data (NDNS) showed that, while saturated fat intakes had fallen, they remained higher than the recommended level of 11% total energy.¹⁷ Only one third of adults achieved the 5-a-day target for fruit and vegetables; and oily fish consumption did not meet the recommended one portion per week.

1.3 Putting food based dietary guidelines into practice

The eatwell plate communicates the principle of a healthy balanced diet; however, consumers still appear to have difficulty putting this into practice. In order to move the eatwell plate and accompanying advice forward, the FSA in Scotland commissioned the design of an *eatwell week* to provide a detailed illustration of how a healthy balanced diet could look over the course of one week. The resource was intended to demonstrate to consumers, health professionals and policy makers how public health nutrition advice from the FSA in Scotland could be applied to weekly food intake and assist individuals in planning their own meals.

The *eatwell week* resource meets the requirement to achieve UK Dietary Reference Values (DRVs) and other dietary recommendations, and considers factors affecting food intake including access, affordability, cooking skills, food waste and food labels.

1.4 Aims and objectives

The overall aim of the present project was to develop and test an *eatwell week* resource, to illustrate to consumers and health professionals what a healthy balanced diet could look like over the course of a week.

The key objectives were to:

1. Use information on meals, drinks and snacks consumed in the UK to inform the design and development of the *eatwell week*
2. Develop an *eatwell week* as an example of how a healthy balanced diet could look over the course of one week. Specifically, the design of the *eatwell week* considered:
 - *Nutritional requirements*
 - *Existing eatwell plate advice*
 - *Commonly consumed meals*
 - *Use of processed foods*
 - *Sustainability*
 - *Accessibility*
3. Analyse the *eatwell week* to ensure key DRVs were met
4. Develop supplementary information to accompany the *eatwell week* and aid the exchange of nutritionally equivalent foods within the food groups
5. Test the *eatwell week* resource with consumers and health professionals to assess the main messages and the format, usability, clarity, understanding, relevance and acceptability

2. METHODS

2.1 Basis of the *eatwell week menu*

2.1.1 Design and nutritional composition of the menu

The *eatwell week* is based on current UK nutrient Dietary Reference Values.¹⁸ The *eatwell week* was designed to meet micronutrient intake requirements (where it is plausible that sufficient intakes can be obtained within one week) as well as recommendations for fibre (non-starch polysaccharide) and percentage energy from fat, saturated fat and non-milk extrinsic sugars (NMES).

The resource was required to:

- meet current UK Dietary References Values for energy and macronutrients¹⁸ (Table 1)
- meet key micronutrient recommendations, for vitamins such as folate and vitamin C and minerals such as iron and calcium
- comply with portion advice on fruit and vegetables (5-a-day) and fish (2 portions per week, one of which should be oily fish)
- meet the SACN recommendation on cooked red and processed meat consumption ($\leq 70\text{g/d}$)¹⁹
- not exceed the target for salt intake (6g/d)²⁰

Energy intake, proportion of energy from macronutrients, and micronutrient intakes were averaged over the course of the *week*, rather than on a daily basis. The achievement of nutritional criteria over the course of the week demonstrated the key principle of the *eatwell week* and allowed greater flexibility and variety for consumers. The *eatwell week* was intended to sit as close to the limits of the DRVs as possible, so that the change for the general population from their actual diets, which do not meet the DRVs, towards the *eatwell week* and a healthy balanced diet were not too great.

Table 1: Target energy, macronutrient and micronutrient composition of the *eatwell* week

Nutrient (unit)	Dietary Recommendation
Energy (kcal)*	~2000
Total Fat (% energy)**	35
Saturated Fat (% energy)**	11
Carbohydrate (% energy)**	50
NMES (% energy)**	≤11
NSP(fibre) (g)**	18
Protein (energy)***	15
Salt (g)#	6
Vitamin A (µg) ^a	700
Folate (µg) ^a	200
Vitamin C (mg) ^a	40
Iron (mg) ^b	14.8
Zinc (mg) ^a	9.5
Calcium (mg) ^a	700

* Target daily energy intake (discussed in the following section)

** Dietary Reference Values for adults

*** Protein intakes average 15% energy which exceeds the RNI. However, protein intakes should not exceed twice the RNI (45.0g for females aged 19-50 years)

Based on the SACN recommendation

^a RNI for males aged 19-50 years

^b RNI for females aged 19-50 years

Energy base of the eatwell week

Consideration was given to basing the energy content of the *eatwell week* on the mean of adult male and female estimated daily average requirements (~2250 kcal).

However, there was the potential that, for many women, this energy intake could result in weight gain. A decision was reached by the project reference¹ group that the *eatwell week* would be based on the estimated average requirement (EAR), of adult women with a physical activity level of 1.4 which is around 2000 kcal/d.¹⁸ This level of energy intake would satisfy the EARs for women aged 19-50 years (1940 kcal) and older women aged 51 years and over (1900 kcal).

Average energy intakes for women aged 19-64 years are currently reported as below the EAR for food energy at 1638 kcal.¹⁷ However given the rising prevalence of overweight and obesity this level of energy intake seems implausible as for many women as this level of intake would lead to weight loss. These data are likely to reflect under-reporting, which is widely recognised in dietary surveys. New draft Estimated Average Requirements (EARs) for energy for the UK population.²¹ calculate EARs for energy for women aged 19-49 of around 2000kcal. These calculations are for weight maintenance at a BMI of 22.5 kg/m², for those with a higher BMI, energy requirements will be greater.

Information was included within the resource on how to increase or decrease energy intake depending on gender and level of physical activity. For individuals with higher or lower energy requirements, calculations were completed to identify which foods could be included or excluded from the *eatwell week* whilst still maintaining micronutrient provision and the correct proportions of energy from macronutrients, without exceeding maximum salt intake recommendations. Calculations were carried out to illustrate the *eatwell week* \pm 500 kcal.

Energy provided at individual eating occasions

The *eatwell week* was not designed to exemplify meals which comprise a specific percentage of total daily energy intakes. Instead, a daily total energy intake of ~2000kcal was achieved by combining three meals and one or two snacks.

¹ Project Reference Group: CR Hankey, WS Leslie & MEJ Lean (University of Glasgow), F Comrie & H Peace (Food Standards Agency in Scotland)

As alcohol is not included in the eatwell plate, there is no allowance for alcohol in the *eatwell week*. Nutrient composition calculations were based on ~2000kcal from food energy only.

Micronutrient intakes

Once macronutrient composition was achieved, micronutrient content was checked against RNI. Where micronutrient RNI was different for males and females, it was important that the higher reference nutrient intake was achieved by the *week*. For example, the female RNI for iron was used, as females have a higher iron requirement than males, whereas for most micronutrients, male requirements are higher (Table 1).

2.2 Food choices for the *eatwell week menu*

2.2.1 Existing food consumption data

Data on meals and snacks commonly consumed by UK adults (16 yrs+) were obtained from Taylor Nelson Sofres (TNS) (Appendix 1). Cereal and toast were the most common breakfast food items; sandwiches and soups were the most popular lunchtime meals. Pasta was the most popular evening meal, followed by roast dinner. Differences were seen in the choices of snacks depending on the time of day consumed. The most popular morning snacks were biscuits and fruit, whereas crisps, nuts and snacks, confectionery and cheese were the most favoured afternoon and evening snacks. Overall, the most popular snack item was biscuits.

Selecting foods for the eatwell week menu

In order to achieve energy and nutrient intakes, all foods in the *eatwell week* must be consumed. However, the *eatwell week* was not designed to provide recommended portion sizes or serving frequencies, where there was no scientific evidence base. Portion weights/sizes used to achieve a daily energy intake of ~2000kcal/d were not made explicit in the *eatwell week*. The *eatwell week* only recommended that individuals consume:

- Five portions of a variety of fruit & vegetables each day
- Two portions of fish (one to be oily) each week
- No more than 70g red meat per day

TNS data guided the development of a draft 7 day *eatwell week* menu which was reviewed and revised by the project reference group. The menu used in the nutritional analysis comprised three main meals (breakfast, lunch and evening meal) plus one or more foods which could be consumed as snacks or as additions to meals. Two cooked breakfasts were included, which could be prepared when there was more time. The remaining breakfasts comprised toast with either wholegrain breakfast cereals or porridge (Appendix 2)

Lunches comprised mainly sandwiches and soups, reflecting the TNS data. A baked potato with filling and beans on toast with grated cheese were included to introduce some variety. Fish (canned tuna) was incorporated at one lunchtime occasion. A variety of evening meals were included. Red meat was included in the evening meal on two days and two portions of fish were incorporated – one white and one oily to meet current dietary targets.

Although types of fruit were suggested in the *eatwell week*, it was intended that users would choose which fruits to consume dependent on their preference, on cost and availability. Four commonly eaten fruits (apples, bananas, oranges and grapes) were used for the purpose of analysis.

Calculation of the fruit and vegetable content of the *eatwell week* included the fruit and vegetable content of recipe dishes as these can contain significant amounts of fruit and vegetables. In line with the 5-a-day criteria, fruit juice and pulses (including baked beans) were included in the calculation up to a maximum of one portion per day each. It was considered important that there were visible portions of fruit and vegetables in addition to those included in meals.

Serving amounts for the *eatwell week* were guided by The FSA Food Portion Size book,²² with consideration to what could be reasonably incorporated within nutritional guidelines. As noted earlier, this does not imply that the *eatwell week* recommends particular portion sizes, as the *week* menu is designed as a detailed illustration of how a healthy balanced diet might look over the course of a week

Use of recipes

Recipes for meals indicated as commonly consumed by TNS data and included in the *eatwell week* were, where possible, sourced from the eatwell website.⁸ The provision of recipes had a two-fold purpose; to provide healthier versions of meals/foods which may otherwise have been purchased as convenience meals, and to encourage consumers to cook meals from their raw ingredients.

Use of processed foods

There is no stipulation in the eatwell plate guidelines as to whether foods should be home-cooked and for many consumers convenience foods provide a practical solution to time constraints. As such, the *eatwell week* was designed to include one meal (lunch) consumed outside the home. Advice was also provided food labels and on checking the level of fat and/or sugar in those foods which do not use FSA front-of-pack labelling.

Sustainability criteria

The Food Standards Agency has taken steps to formalise a commitment towards sustainable development²³ and consideration was given to ensuring that the *eatwell week* demonstrated a healthy and sustainable diet. However, at this stage, the first step was to reduce food waste by using leftovers and minimising the number of different foods used in the week.

Accessibility criteria

The meals and snacks included in the eatwell plate were designed to be affordable for those on low incomes, so that the advice could be used by all. In light of increases in food prices and of the cost of living as a whole, it was essential that consumers were provided with the tools to eat healthily according to their budget. For example, four commonly consumed fruits were included in the *eatwell week* and more exotic varieties were avoided in order to be as accessible as possible.

2.3 Dietary Analysis of the *eatwell week* menu

2.3.1 Nutrient composition calculations

Analysis of the *eatwell week* menu was carried out in Microsoft Excel using the nutrient databank from year 1 of the National Diet and Nutrition Survey 2008-2011 rolling programme (NDNS).

The databank contains over 5000 foods and drinks, including recipes, data obtained from food manufacturers and nutritional information from food labels. Codes for the foods comprising the draft *eatwell week* were identified in the NDNS database, reviewed by the project reference group and a consensus reached on the codes to be used in the analysis. An Excel database was compiled comprising the agreed foods and codes with nutrient values for the 7 days of the menu (Appendix 3).

Analysis of recipes included adjustment for cooking losses of macronutrients and vitamins which were carried out in Excel using the equations available in McCance & Widdowson UK Food Composition Tables.²⁴ Serving sizes of recipes were adjusted to reflect logical servings i.e. half or quarter of the cooked weight of the recipe.

2.3.2 Iterations to the *eatwell week*

Analysis of the draft *eatwell week* was an iterative process with adjustments made to portion sizes and the inclusion/exclusion of foods in order to achieve the agreed macronutrient composition of the *eatwell week*. Initially, fat contribution to energy was too low and protein contribution was too high, and a number of iterations were required to correct this.

Consideration of additional or reduced energy requirements

Two-thousand kcal/d may be too much or too little to eat for some individuals depending on gender and level of physical activity. To provide advice to help consumers adapt the resource to their individual requirements, some portion sizes were increased or decreased and certain foods were added or removed to provide ± 500 kcal daily. Analysis of these revised *eatwell weeks* was undertaken. This was done by including/excluding whole food items and increasing/decreasing servings by sensible multiples (Appendix 3).

Additionally, to test the suitability of the menu design for children with regards to maximum recommended salt intake, calculations to decrease energy intake were carried out. This was assessed by a proportionate decrease in energy intakes, rather than the addition or subtraction of whole foods items or sensible multiples of serving sizes.

2.4 Supplementary information to accompany the *eatwell week* resource

Additional information and guidance was included to assist *eatwell week* users in using the *eatwell week* resource. These sections highlighted that the *eatwell week* was based on everyday foods, regularly eaten in the UK. Users were advised that the meals did not have to be eaten in the order shown in the booklet but could be mixed and matched. Possible substitutions/alternatives for some of the meals were given, plus information on how drinks which provide energy, (including alcohol) would fit in to the *week*.

A section addressing the variation in energy requirements depending on gender and activity levels was included and suggestions on how to increase or decrease the calorie content of the menu given, based on the ± 500 kcal iterations. To maximise flexibility, advice was given that the foods included in the *eatwell week* menu could be eaten at any point throughout the day. Advice was given to encourage consumers to only purchase foods they would use in the week and on using and freezing leftovers. Advice was also developed and included on:

- How shopping/planning/storing food effectively could make implementing the *eatwell week* easier
- Salt intake recommendations
- Fruit and vegetable recommendations
- Using food labels, in particular the FSA front-of-pack labelling system
- Making healthier choices when eating out was given in addition to advice on how to compensate for consuming too many high fat and/or sugar foods
- Avoiding waste
- Food safety; focussing on cooking, chilling, cleaning & cross contamination

The *eatwell week* was designed to be used by individuals with different cooking abilities and a wide range of reading and comprehension levels and was tested with consumers who had a range of reading and cooking abilities (see section on focus group testing).

2.5 Format of the *eatwell week* resource

The format of the resource, which included the revised menu on completion of the nutritional analysis, was an A5-sized booklet with a continuous spiral binding (Appendix 4). The booklet included 7 pages divided into 4 sections (one each for

breakfast, lunch, evening meal and snacks). This design allowed meal options for each day to be interchangeable, thus increasing the flexibility of the *week*.

The front of each section showed a picture of the suggested meal with text alongside detailing the contents of the meal. The reverse of each section gave either the recipe ingredients, more general tips relevant to that particular meal, or meal alternatives. To keep the resource as short as possible, the recipe methods were not included in the version which was tested in the focus groups, although recipes were provided separately. Household measures were used to describe the amount of each component of the meal wherever possible. The days of the week were named in the pre-focus group version of the resource.

Photography

Photographs of all eating occasions were included in the *eatwell week* resource. All meals photographed were prepared/cooked by the study research team using the recipes, ingredients and weights/amounts described in the *eatwell week* resource. Photography was carried out by NHS Greater Glasgow and Clyde Medical Illustration. Standardised procedures were used to ensure all pictures were clear and comparable. At this early stage in the resource development professional food photography was not possible or justified, due to financial constraints. The Food Standards Agency in Scotland is taking this forward separately.

2.6 Testing the *eatwell week* resource

Ipsos MORI Scotland, an independent market research agency, was sub-contracted to test the draft resource with consumers and with health professionals who might use it in their work. The main aim of this work was to test the appeal and effectiveness of the resource, determine the clarity and understanding of the main messages and to gather views on the format of the resource plus its usability and acceptability. These data were used to inform revisions to the draft resource and guided the development of the post-focus group version of the *eatwell week* resource. A full report of the focus group work can be found in Appendix 5, but a summary of the methodology is provided below.

Recruitment screening questionnaires and topic guides for use in focus group sessions were developed by Ipsos MORI (Appendix 6). These were reviewed and approved by the project reference group. All participants were paid for their participation in the focus group testing.

2.6.1 Consumer testing

Testing was carried out with a range of consumers in different demographic groups, with different cooking habits and in different parts of the UK (Dundee, Lewisham, Redditch and Salford). It was felt that there was little point in testing *eatwell week* with people who had little interest in such a resource as they were unlikely to use it, so potential participants were asked:

“Experts in nutrition are producing a menu of example meals and recipes that people can follow to ensure that they have a balanced diet over the course of a week. If you saw this somewhere, how interested would you be in trying it out?”

Only those who said they would be ‘very interested’ or ‘quite interested’ were recruited. Potential recruits were also asked:

“Taking part in this research would involve trying out the menu that I have just described in between the two group sessions. Are you willing to do this?”

Only those willing to try out the menu were recruited. People who were responsible for less than half of their household shopping, who prepared less than half of the evening meals in their household and people who typically ate fewer than four evening meals a week at home were also excluded. Participants were not given any other information about the *eatwell week* in advance of the first session.

Recruitment was undertaken by market research recruiters working on the street or door-to-door in the relevant locations using a screening questionnaire to ensure the quotas were achieved.

Four groups of consumers met twice. In the first session they were introduced to the resource, discussed their initial reactions and were invited to try out the resource. In the second session, two weeks later, they discussed their experiences of using the *eatwell week*.

There were nine participants in three of the locations; Dundee (5 men, 4 women), Salford (4 men, 5 women) and Redditch (5 men, 4 women). In Lewisham, eight participants (3 men, 5 women) attended the first session and seven (3 men, 4 women) attended the second session. Across the groups, there were 5 participants from minority ethnic groups.

Three in-depth interviews were undertaken with consumers with lower literacy levels. The interviews focused on participants' comprehension of the resource and, in particular, whether there were specific words or aspects of the text with which they had difficulty.

2.6.2 Testing with health professionals

One focus group comprised 6 health promotion professionals based in London. Four participants worked for Primary Care Trusts (PCTs) in a variety of roles relating to public health, health promotion and community development/community food initiatives and two were representatives from major health charities. Recruitment was undertaken by telephone by contacting PCTs and relevant charities to identify people in relevant roles.

A group of 6 other health professionals, who worked in various locations across the Scottish Central Belt, was recruited and met in Falkirk. The group comprised 2 Practice Nurses, 2 Cardiac Rehabilitation Nurses and 2 Occupational Health Nurses. This group met twice – once to be introduced to the resource and to discuss their initial reactions, and a fortnight later to discuss their experiences of using the resource with clients. Participants were recruited by telephone via their employers

Another group comprised 7 London based community Dietitians. The original plan had been to reconvene this group to discuss their experiences of using the resource with clients. However (as discussed in the findings), it was felt that the resource was not suitable for use with their clients so the second meeting was cancelled. Recruitment was undertaken primarily by telephone (also by email).

3. RESULTS

3.1 Dietary Analysis

3.1.1 Energy and Macronutrients

Mean energy provision was 2050 kcal, 102% of the target of 2000 kcal/d. Daily energy intake ranged from 1833– 2181 kcal/d (Table 2). Mean percentage food energy from fat was lower than the DRV at 34%, as was mean percentage energy from saturated fat (10%) and NMES (9%).

Saturated fat and total fat content varied throughout the week, but only exceeded the maximum DRV on one day of the week (+1.5%). Percentage energy from carbohydrate exceeded the DRV by around 4% on two days of the week (Table 3).

3.1.2 Micronutrients

Mean salt content was below the maximum recommended intake (Table2). As with other nutrients, salt content varied daily and exceeded the RNI by around 1g on 2 days of the week (Table4). Ensuring that salt intake did not exceed an average of 6g/d was the main limiting factor in the menu design.

The *eatwell week* menu achieved all other micronutrient intakes, apart from selenium (Table 2). For at least 8 micronutrients (iron, zinc, B12, B6, riboflavin, niacin and vitamin C) content varied by as much as 50% between days, depending on the foods suggested for each individual day (Table 4).

3.1.3 Fruit and Vegetables

The target for fruit and vegetables of 5-a-day (400g) was achieved on each day of the *eatwell week*. Mean daily content was 544g (range 434-720g) and included visible portions of fruit and vegetables and those contained in composite dishes (Table 3)

The SACN recommendation of no more than 70g of cooked red meat per day was achieved as was the dietary target for fish intake.

Full nutritional composition analysis can be found at Appendix 3.

Table 2: Target and actual mean energy, macronutrient and micronutrient composition of the *eatwell week* menu

Nutrient (unit)	Target	<i>eatwell week</i>
Energy (kcal)*	~2000	2050
Total Fat (% energy)**	35	33.5
Saturated Fat (% energy)**	11	9.8
Carbohydrate (% energy)**	50	51.0
NMES (% energy)**	≤11	8.7
NSP(fibre) (g)**	18	23.7
Protein (%energy)***	15	16
Salt (g)#	6	5.5
Vitamin A (µg) ^a	600	1022
Thiamin (mg) ^a	1.0	2.1
Riboflavin (mg) ^a	1.3	1.9
Niacin (mg) ^a	17	24.8
Vitamin C(mg) ^a	40	190
Vitamin B6 (mg) ^a	1.4	2.6
Vitamin B12 (µg) ^a	1.5	4.7
Folate (µg) ^a	200	361
Potassium (mg) ^a	3500	4199
Calcium (mg) ^a	700	924
Magnesium (mg) ^a	300	358
Phosphorous (mg) ^a	550	1445
Iron (mg) ^b	14.8	15.4
Zinc (mg) ^a	9.5	9.2
Selenium (µg) ^a	75	53.0

* Target daily energy intake

** Dietary Reference Values for adults

*** Protein intakes average 15% energy which exceeds the RNI. However, protein intakes should not exceed twice the RNI (45.0g for females aged 19-50 years)

Based on the SACN recommendation

^a RNI for males aged 19-50 years

^b RNI for females aged 19-50 years

Table 3: Daily Energy and macronutrient content of the *eatwell week*

	Kcal	Protein	Fat	Saturated Fats	Carbohydrate	NMES	Fibre	Fruit & veg.	
DRV/dietary target	2000	15% energy	35% energy	11% energy	50% energy	≤11%energy	24g	400g	5 portions
Saturday	2083.6	96.0	71.9g	19.3g	281.2	24.8g	28.5g	540.0g	6.0
<i>% energy</i>		<i>18.4</i>	<i>31.1</i>	<i>8.4</i>	<i>50.6</i>	<i>4.5</i>			
Sunday	1969.4	75.9g	81.0g	22.3g	249.6g	55.5g	20.7g	610.0g	5.8
<i>% energy</i>		<i>15.4</i>	<i>37.0</i>	<i>10.2</i>	<i>47.5</i>	<i>10.6</i>			
Monday	1833.1	59.9g	67.1g	21.8g	263.9g	35.5g	24.5g	720.0g	8.0
<i>% energy</i>		<i>13.1</i>	<i>32.9</i>	<i>10.7</i>	<i>54.0</i>	<i>7.3</i>			
Tuesday	2088.2	84.4g	73.1g	16.5g	291.9g	49.1g	21.9g	515.0g	6.5
<i>% energy</i>		<i>16.2</i>	<i>31.5</i>	<i>7.1</i>	<i>52.4</i>	<i>8.8</i>			
Wednesday	2064.1	83.2g	82.1g	28.6g	265.1g	73.9g	20.0g	434.0g	6.5
<i>% energy</i>		<i>16.1</i>	<i>35.8</i>	<i>12.5</i>	<i>48.2</i>	<i>13.4</i>			
Thursday	2181.1	85.3g	85.9g	23.9g	284.8g	24.9g	26.2g	545.0g	6.7
<i>% energy</i>		<i>15.6</i>	<i>35.5</i>	<i>9.9</i>	<i>49.0</i>	<i>4.3</i>			
Friday	2129.5	72.1g	73.2g	24.0g	315.6g	67.5g	23.9g	524g	5.9
<i>% energy</i>		<i>13.5</i>	<i>31.0</i>	<i>10.1</i>	<i>55.6</i>	<i>11.9</i>			

Table 4: Daily Micronutrient content of the *eatwell week*

	Vit. A	Thia	Ribo	Nia	Vit. C	Vit. B6	Vit B12	Folate	Na	Salt	K	Ca	Mg	P	Fe	Zn	Se
	(µg)	(mg)	(mg)	(mg)	(mg)	(mg)	(µg)	(µg)	(mg)	(g)	(mg)	(mg)	(mg)	(mg)	(mg)	(mg)	(µg)
RNI	600	1.0	1.3	17	40	1.4	1.5	200	1600	6	3500	700	300	550	14.8	7.0	75
Saturday	1071.1	1.6	1.6	17.6	264.7	2.6	7.0	372.5	2670.3	6.7	4700.1	1042.4	399.5	1707.7	20.7	14.1	51.7
Sunday	1107.0	2.1	1.2	23.7	252.1	2.3	1.6	327.2	2835.3	7.1	3739.5	612.4	301.3	1110.8	8.7	7.1	40.6
Monday	1015.9	1.4	0.8	12.9	109.8	1.8	1.7	229.5	1814.0	4.5	3311.8	721.8	347.8	1258.9	12.4	8.0	36.1
Tuesday	978.3	2.5	1.9	33.0	134.7	3.6	4.6	364.2	1371.6	3.4	5101.4	642.3	422.4	1399.7	13.7	8.0	83.7
Wednesday	1135.2	2.4	2.6	35.6	108.6	2.8	6.5	398.1	2077.1	5.2	4211.0	997.3	328.4	1481.7	17.1	7.7	58.7
Thursday	1188.3	2.1	3.0	24.1	230.4	2.0	6.8	415.1	2367.9	5.9	4314.7	1490.3	385.9	1715.7	16.9	12.1	49.3
Friday	655.0	2.5	2.6	26.4	232.1	3.2	4.8	420.3	2282.0	5.7	4015.9	962.4	317.9	1438.4	18.3	7.3	51.0

3.1.4 Consideration of additional or reduced energy requirements

In ± 500 kcal versions of the *eatwell week*, the proportion of energy from each macronutrient no longer met Dietary Reference Values; however this was due to increased contributions to energy from carbohydrate and protein, rather than from fat (Table 5). Healthy eating recommendations for fruit and vegetables, red meat and oily fish were still achieved in both altered versions. The +500 kcal *eatwell week* exceeded the 6g/d population salt target (but not the 7g target for males, which was calculated by adjusting for increased energy intake).²⁰

Adjustments to the menu to *increase* energy content included:

- Proportionately increasing servings of recipes
- Increasing the amount of pasta, rice and potatoes served with meals
- Increasing the amount of bread
- Increasing the amount of breakfast cereal and milk
- Adding more fruit and vegetables
- Adding more sandwich fillings

Here, the limiting factor was not exceeding the maximum recommended salt intake.

Adjustments to the menu to *decrease* energy content included:

- Changing to 1% milk and 60% fat spread
- Removing some dessert items
- Removing crisps, biscuits and confectionery
- Removing some bread (e.g. toast at breakfast, naan bread and garlic bread)

Here the limiting factor was maintaining micronutrient intake.

Full nutritional composition analysis of the *eatwell week* ± 500 kcal daily can be found at Appendix 3.

Table 5: Target and actual energy, macronutrient and micronutrient composition of the *eatwell week* menu and *eatwell week* menu ± 500 kcal/d

Nutrient (unit)	Target	<i>eatwell week</i>	<i>eatwell week</i>	
			+500 kcal	-500kcal
Energy (kcal)*	2000	2050	2457	1553
Total Fat (% energy)**	35	33.3	31.8	29.9
Saturated Fat (% energy)**	11	9.8	9.0	7.6
Carbohydrate (% energy)**	50	51.2	52.6	52.5
NMES (% energy)**	≤ 11	8.6	8.1	7.5
NSP(fibre) (g)**	18	23.9	29.2	20.2
Protein (% energy)***	15	15.6	15.6	17.6
Salt (g)#	6	5.6	6.2	4.1
Vitamin A (μg) ^a	600	1021.5	1285.9	964
Thiamin (mg) ^a	1.0	2.1	2.6	1.9
Riboflavin (mg) ^a	1.3	1.9	2.5	1.8
Niacin (mg) ^a	17	24.8	32.4	22.2
Vitamin C(mg) ^a	40	190.4	221.4	188
Vitamin B6 (mg) ^a	1.4	2.6	3.5	2.4
Vitamin B12 (μg) ^a	1.5	4.7	5.6	4.4
Folate (μg) ^a	200	357.2	431.3	325
Potassium (mg) ^a	3500	4219.6	5148.2	3854
Calcium (mg) ^a	700	930.4	1025.3	778
Magnesium (mg) ^a	300	359.6	444.4	304
Phosphorous (mg) ^a	550	1448.0	1692.2	1197
Iron (mg) ^b	14.8	15.4	19.6	13.2
Zinc (mg) ^a	9.5	9.2	11.1	7.7
Selenium (μg) ^a	75	54.2	68	47.5

* Target daily energy intake ** Dietary Reference Values for adults

*** Protein intakes average 15% energy which exceeds the RNI. However, protein intakes should not exceed twice the RNI (45.0g for females aged 19-50 years)

Based on the SACN recommendation

^a RNI for males aged 19-50 years; ^b RNI for females aged 19-50 years

3.1.5 Consideration of reduced energy requirements for children

Table 6 shows decreased energy intake and proportionately adjusted salt intake from the *eatwell week*. The table shows that the SACN salt targets for children younger than 7 years of age are lower than the proportionate level achieved in the *eatwell week* (lower than 5g/d),¹⁹ thus for use with younger children, certain salty foods would have to be excluded from the *week*.

Table 6: Proportionate decreases in energy and salt intakes from the *eatwell week*

Age (years)	EAR (kcal/d)	Salt intake from <i>eatwell week</i> (average g/d)*	Maximum recommended salt intake (g/d)
1-3	1165	3.1	2
4-6	1545	4.1	3
7-10	1780	4.8	5
11+	1845	5.0	6

* Based on average intake of 2050 kcal and 5.5g salt/d in *eatwell week* menu

3.2 Focus group testing of the *eatwell week*

3.2.1 Presentation and style

Initial reactions to the presentation of the resource were positive. Most appealing with both consumers and health professionals, were the split pages which did help convey the message that meals and snacks from different days were interchangeable. The inclusion of photographs increased engagement with the resource, and served as a useful guide in the preparation of meals. However, participants were drawn to these pages and often failed to read the introductory and supplementary text. This frequently left people with questions which were answered within the booklet, e.g. the purpose of the resource or its intended users. Health professionals, in particular, felt that it was unclear who the *eatwell week* was intended for and what purpose it served.

Testing with three adults from a low literacy class found that they struggled with words that could not be further simplified such as 'plate' and 'recipe'. The resource is therefore not likely to be suitable for individuals with literacy difficulties.

3.2.2 Content

Consumers reported that the *eatwell week* was realistic as it included, largely, foods that they recognised and that they already ate (although often in ready meal or takeaway format) as well as some 'treats'. There had been a preconception amongst consumers that it would contain *more* salad and vegetables, which is interesting, as the *week* exceeds the 5-a-day target.

Health professionals, mainly in London, felt that the meals were very European and thus not suitable for many of the ethnic and cultural groups that they dealt with.

Lack of cooking skills did not appear to be a significant barrier to using the *eatwell week*. Those, who usually didn't cook, or cooked very little, found the recipes easy to follow, 'do-able' and felt a sense of achievement having cooked from scratch. That the recipes did not have long, off-putting lists of ingredients was commented on positively. However advice on how to include pre-prepared foods or takeaways in the week was also requested.

Initial reactions from some (particularly women), as well as more considered reflection after trying the menu, were that there was simply too much food included in the *eatwell week*. Both consumers and health professionals, felt there was too much bread and carbohydrate included, despite the *week* achieving an average of 51% energy from carbohydrate, which is very close to the DRV.

3.2.3 Consumer behaviour

Those who reported following the *week* closely reported an increased sense of wellbeing. Having eaten breakfast, which previously many had not done, some participants claimed to have consumed fewer fatty and/or sugary snacks, particularly mid-morning. Even those who did not follow the week closely reported being influenced by the booklet when making decisions about what to eat while on the go or out socialising.

Lack of facilities to prepare lunch at work was frequently raised as a significant barrier and many wanted the inclusion of more 'packed lunch' or sandwich options to eat away from the home.

The message of balance, flexibility and adaptability was central to the *eatwell week*, however many consumers lacked the requisite food knowledge to be able to make sensible substitutions or adaptations to the meals which they did not want to eat. It was frequently reported that vegetables were removed from meals/recipes, or that the same meal was consumed on multiple occasions throughout the week.

Guidance on snacks was most frequently misinterpreted by consumers: despite guidance to the contrary, many participants thought they were to be consumed at the end of the day; where two snacks were shown, this was interpreted as an either/or choice (which, in the case of portions of fruit, it was not); some felt bound by the suggested fruits rather than substituting with fruits that they might prefer.

4. Revisions to the *eatwell week* resource

The draft *eatwell week* resource was revised in light of focus group data and a post-focus group version was developed (Appendix 7). No changes were made to the foods and drinks included. Specific revisions included the addition of a subtitle “*putting healthy eating into practice*” on the front cover to indicate the purpose of the *eatwell week* and introduce the concept of *healthy eating* as early as possible. In the introductory text, clear statements were made regarding who the week was for and the benefits of healthy eating on long-term health were emphasised. An additional split page was added which provided information on using the *week* on both sides of these sections. It was hoped this may overcome the problem of people overlooking the explanatory information as a result of being drawn immediately to the more interesting split pages.

Focus group participants had agreed that the resource would be more useful if full recipes were included. With the recipes added to the end of the resource, there was more scope within the split pages to provide healthy eating tips and other advice to support the *eatwell week*. The benefits of eating breakfast were highlighted and alternative options given for those who felt they cannot eat breakfast when they first get up. Specific tips were given on making the lunches shown easier to consume outside of the home.

The supplementary/additional information was re-worded, presented more concisely and in a question and answer format, which was one of the main suggestions from the focus group report. Supplementary information at the back of the resource was divided into the following questions:

- Will there be enough for me to eat?
- What if I need to eat more or less than shown?
- Why is there a lot of bread, pasta, potatoes and rice in the week?
- What about drinks?
- What about alcohol?

New information was provided on fish and meat (in light of the SACN Iron and Health report)¹⁹ and information on salt, meal plans & shopping, eating out, food labels and food safety was reworded to ensure clarity and brevity.

The fruit & vegetables section was removed to free-up space as it was agreed consumers were, in the main, aware of the 5-a-day message. More alternatives/substitutions to the illustrated meals were given to increase flexibility and encourage implementation of healthy eating beyond the *week*, i.e. instant oats as an alternative to porridge; left-over curry or Bolognese sauce as fillings for the baked potato; and a salmon and leek pasta dish instead of grilled salmon with potatoes and vegetables.

As the recipes were now included within the booklet, tips were added alongside them on how to modify the recipes to extend the use of the *eatwell week*, these included: changing the Bolognese sauce to chilli sauce (addition of red kidney beans and chilli flakes) and serving with boiled rice, use of other meats or meat substitutes (pulses, fish, prawns) in the curry recipe, and other fruits and spices suggested for the crumble recipe (Appendix 7).

Suggested meal alternatives and modifications to recipes were kept as close as possible to the original meal/recipes so that the nutritional composition of the menu was not significantly altered. The days of the week were not specifically named in the post-focus group resource, to allow more flexibility for consumers.

5. Discussion

The shift in dietary and lifestyle patterns of many populations, including the UK, has contributed to the rising prevalence of obesity.²⁵ Resources such as the eatwell plate and other international models aim to make healthy eating simpler to grasp, however recent data suggests that individuals may still have difficulty in understanding and applying the guidance set out by these models.¹¹⁻¹³ Recent dietary monitoring has confirmed that the UK population currently fails to achieve dietary recommendations.^{15,16} Provision of additional tools to help individuals interpret and put into practice healthy eating dietary advice is pertinent and supports the UK and Scottish Governments' public health policies.

5.1 Constraints imposed by Dietary Reference Values

Use of the NDNS nutrient databank ensured that analysis of the week was as accurate and current as possible in terms of nutrient content. The main limiting factor in the design of the menu was ensuring that salt intake did not exceed an average of **6g/d**. Average salt intake below the maximum recommended was achieved. Some 'standard' food options were selected, including standard mayonnaise, crisps and garlic bread, rather than lower fat options, to maintain total fat intake at the limit of the DRV (no more than 35% energy from fat). These options could be included in the *week* due to the small amount of foods high in fat and/or sugar overall.

Micronutrient content varied considerably between days and this was inevitable given the choices of meals, which were based on TNS data. Variations were the result of foods or food groups which were rich in particular micronutrients e.g. red meat (iron), citrus fruits (vitamin C) and did not result from the inclusion of specific micronutrient rich foods in order to address nutrient shortfalls. The use of any data reporting food or meal popularity, essential to ensure menu variety and acceptability would have resulted in similar micronutrient variations.

The *eatwell week* achieved all the relevant nutrient intake targets with the exception of selenium. However selenium intake does exceed the LRNI for both male and female adults (40µg/d). Specific foods i.e. Brazil nuts, could have been added to the menu to address this deficit; however it would not have been appropriate to include uncommonly consumed foods in the *eatwell week*.

Alternatively extra bread, an important source of selenium, could have been included; however this would have increased the salt content. No adverse effects have been identified from lower levels of selenium,¹⁸ so addressing the shortfall was considered to be outside the remit of the present project.

The low salt content of the *eatwell week* (mean 5.5g/d) was not raised as an issue in the focus groups, despite concerns that consumers might find the *eatwell week* bland. This may reflect an acceptance of the salt content of the *week*, though it is also possible that additional salt was added to meals by those who tested the week or that saltier foods were used in place of those shown in the *week*.

The *eatwell week* should lend itself to use within families. Proportionately decreasing energy intake would proportionately decrease salt intake and the *week* would be suitable for children above 7 years old. However the SACN salt targets for children younger than 7 years old are lower than the proportionate level achieved in the *eatwell week* (lower than 5g/d),²⁰ thus for use with younger children, certain salty foods would have to be excluded from the *week*. Additionally, these calculations were completed on the basis of proportionate decreases in energy intake and do not necessarily reflect a decrease in energy intake from removing whole food items or a reasonable decrease in serving amounts (e.g. half a serving of a main meal dish).

One solution could be to reduce further the salt content of the *week*, so that it is suitable for younger children and can be used by more families. It should be considered that following the *eatwell week* may, for many families, facilitate an improvement in dietary intake and a lowering of usual salt intake and there may be an opportunity to develop advice for families on choosing lower salt foods.

The *eatwell week* illustrated fruit and vegetable provision of 5-a-day. Currently, the national average intake of fruit and vegetables is reported at around 3 portions per day for both men and women.¹⁷ Following the *eatwell week* would result in an increase in fruit and vegetable consumption for many people. It was felt that including much more than 5 portions per day in the *eatwell week* would seem unachievable, and therefore off-putting, to potential users. Focus group feedback suggests this concern may have been well-founded as consumers reported being pleased that the week did not seem overly laden with fruit and vegetables.

Despite limiting the fruit and vegetable content to minimum target of 5-a-day this still did not seem to encourage consumption, of vegetables in particular, by some consumers. Consumer feedback revealed that if the vegetables illustrated as an accompaniment to a main meal or included in a recipe were disliked they were omitted rather than substituted with preferred options. This may reflect a general reluctance to consume fruit and vegetables and highlighted the difficulties encountered in this, and other initiatives to improve dietary intakes particularly of fruit and vegetables.²⁶

The dietary intakes achieved in the *eatwell week* are very similar to those achieved in work carried out to develop the Livewell diet which met current dietary recommendations and also the 2020 target for reductions in greenhouse gas emissions.²⁷ The Livewell sample menu is similar to the *eatwell week* with breakfasts mainly cereal based, soups and sandwiches for lunches and a similar mix of fish meat and pasta dishes for evening meals.

5.2 Use of TNS data

The use of the TNS data to guide the development of the *eatwell week* was important to ensure the appropriateness of the *eatwell week* sample menu for the UK population. It was hoped that including foods/meals that were familiar and commonly consumed in the UK would improve user acceptability of the resource. Feedback from consumer focus groups supported this decision as participants reported being encouraged and reassured to see foods in the *eatwell week* they recognised and already included in their diet. Food data, on which the Livewell menu was based, were derived from NDNS data and also unpublished food diary data,²⁷ and given the similarity of the menus, confirms the accuracy and acceptability of the foods indicated by TNS data.

It was thought that the energy base of ~2000 kcal/d level may have been too low for some users, in particular men. Conversely, there were reports in the focus groups, although mainly from women, that there was too much to eat. This may reflect the less than optimal dietary habits of those testing the resource. Some focus group participants reported not normally eating 3 meals per day, although it was unclear whether fewer or more than 3 meals were usually consumed.

Many individuals were likely to be consuming a diet that included high fat energy dense foods. The *eatwell week* was therefore likely to be considerably different from some consumers' usual dietary intake, as it may have included more bulky food than people were used to as a result of the lower energy density.

5.3 Understanding of the purpose of *eatwell week*

Certain misunderstandings were highlighted in the focus group feedback, particularly in relation to the role of carbohydrates within a healthy diet. Percentage energy from carbohydrate was close to the DRV on each day. However, consumers and some health professionals felt that there was a lot, perhaps even too much, bread (and other carbohydrate) included in the *eatwell week*. For the general public this is likely, in part, to reflect a lack of knowledge and understanding of the composition of a healthy diet. The promotion of low carbohydrate diets as a means of achieving weight loss may also have been incorrectly interpreted as general healthy eating advice by the public.

Inconsistent advice from health professionals has been cited by the public as a barrier to healthy eating.²⁷ Some health professionals did not appreciate that the *eatwell week* was an accurate representation of healthy eating guidelines. Research has shown that health professionals understand the principals of health eating and the requirement that carbohydrate provides around 50% of total energy intake.²⁹ However, the current project has highlighted that some health professionals may not recognise this in practice. This may highlight a difference between how the healthy balanced diet is promoted to consumers in general and how healthy eating guidelines are applied by health professionals for individuals. It is important that the *eatwell week* resource emphasises the role of carbohydrates in a healthy diet. The present work has also highlighted a need for ongoing nutrition training and education of health professionals particularly in relation to carbohydrates. The development of guidance notes to assist health professionals in the use of the *eatwell* resource may also be valuable.

5.4 Addressing barriers to healthy eating

The breakfasts and lunches included in the *eatwell week* consisted of easily prepared meals, with minimal difficulty and time required for preparation. However, despite the simplicity of the meals, barriers to consumption were reported. Lack of time to eat breakfast, or prepare a packed lunch, was raised as an issue, as was lack of facilities at work to prepare lunch. These comments suggest that breakfast is frequently skipped and that the benefits of eating breakfast were not recognised.³⁰

Lack of time has been frequently cited as a barrier to healthy eating.^{28,31} Reluctance to make time to prepare a packed lunch also suggests that for many there is a reliance on commercially pre-prepared sandwiches/foods. The *eatwell week* included a convenience/shop-bought lunch; however consumers wanted more advice on how to include convenience foods, again suggesting a reliance on these products. Many of the lunches illustrated in the week could be easily prepared and taken to work. However it was clear from the consumer feedback that more specific direction was required to highlight the ease with which these meals could be consumed out-with the home. The *eatwell week* was amended post-focus group testing to address these issues (Appendix 7).

It has been suggested that the shift towards convenience meals has eroded the cooking skills of many individuals, which could be a barrier to healthy eating.³² The evening meals included in the week were slightly more complex to prepare but required basic cooking skills only. Although the focus groups were set up to include those who did not cook often, this project did not find lack of cooking skills to be a significant barrier amongst participants. The simple recipes that accompanied the *eatwell week* seemed to help individuals overcome perceived difficulties with cooking, with those who usually cooked infrequently successfully following the recipes. Encouraging people to cook is an important factor in improving dietary habits. Feedback was unanimous that recipes should be an integral part of the resource rather than something that had to be sought out from another source and these were added to the post-focus group version.

The resource was developed to be illustrative and not prescriptive, but perhaps was too reliant on the assumption that consumers would have sufficient knowledge/ability to choose alternatives if what was illustrated was disliked; it was clear that some consumers lacked the requisite knowledge to adapt recipes. Clearer guidance was needed to encourage users to substitute food items for a preferred option rather than omitting foods completely. Messages on substitutions were added to the *week* following the focus group testing.

5.5 Limitations

The focus group testing revealed that concept of a balanced intake over the course of the week was not well understood. In some cases, certain foods/meals from the *eatwell week* were reported to have been consumed more frequently than illustrated, which would unbalance nutrient intake. The *eatwell week* resource will need to communicate more clearly that the foods should only be consumed as frequently as illustrated and that this is particularly important for the more energy dense, high fat and/or sugar foods. This information is essential to enable users to meet the *eatwell* plate guidance which at present is not met by the UK population.^{15,28}

Despite efforts to present the *eatwell week* as illustrative, it was still deemed too prescriptive by focus group participants. Consumers and health professionals felt that the provision of a greater number of specific alternatives to meals and recipes would enhance flexibility and continued use of the *eatwell week*. It is important that users can adapt and substitute meals to sustain use of the *eatwell week*. While being directed to specific alternatives could also be described as prescriptive it was clear that specific direction was required due to lack of knowledge/ability on the part of consumers. Sustained use of the *eatwell week* is an important goal, however, care had to be taken with the suggested alternatives/alterations to the meals and recipes to ensure that DRVs were still met and the scientific basis of the work was not undermined.

While the *eatwell week* suggests that vegetarians replace meat and poultry with vegetarian products, beans, pulses and additional fruit & vegetables, it does not aim to address the dietary requirements of those who exclude all animal products from their diet. Similarly the resource does not target those from ethnic backgrounds.

5.6 Post-focus group version of the resource

The present resource may not be suitable for adults with low levels of literacy. Alternative formats of the resource would need to be developed to target this sector of the population.

The aim of the supplementary information was to facilitate the implementation of the *eatwell week* and enable the continuation of healthy eating over the longer-term. Focus group feedback suggested that this information was not read closely, or at all, in some cases, by both the public and health professionals. Consumers were drawn to the split pages of the booklet and this may have contributed to the lack of attention given to the introductory/supplementary information. Despite being stated in the introduction, individuals in all groups commented that it was unclear who the resource was aimed at or what its purpose was.

Although attempts were made to keep the supplementary information brief by using bullet points, it was still felt that there was too much text which would discourage people from actually reading it. As this information is important for the implementation of the *eatwell week*, it must be presented more concisely.

Testing of the resource revealed that many viewed the resource from a weight management/loss perspective. It seemed that while there is awareness of the need for weight loss interventions to address the problem of overweight and obesity, there was a lack of awareness regarding the role of healthy eating in addressing obesity and in disease prevention. The benefits of the healthy balanced diet as a means to combat overweight and obesity need to be reinforced to both the public and, more importantly, some health professionals.

In order to maximise uptake and usage, the revised resource addressed the issues raised regarding the purpose of the resource, target audience, lack of attention to the supplementary information and emphasised the benefits of a healthy diet.

The style of the *eatwell week* resource, with its split pages, was popular with consumers and has been used in other recently published cookery books. However it was an expensive format to produce and this may jeopardise publication of the resource in this form. Research is also required to explore further the perceptions of health professionals and consumers with regard to healthy eating messages before the resource is ready to be used with the public/health professionals.

5.7 Usefulness to policymakers

The *eatwell week* resource is valuable beyond consumers and health professionals in demonstrating to policy makers what healthy eating actually looks like. Although this type of menu design is not necessarily new, the format, foods included and photography (while limited) highlight how few high fat/sugar/salt foods are included within the limits of the DRVS.

6. Conclusions

This project has demonstrated that it is possible to develop a menu that incorporates foods that are popular and widely consumed by British adults, which meets dietary recommendations and targets and is not dependent on key foods to meet nutrient targets. The main limiting factor in the menu design was ensuring that the recommendations on salt intake were not exceeded. Although mean salt intake is within these limits the menu is not suitable for younger children (<7yrs).

The use of popular, familiar foods addressed the barrier of acceptability and may also make changing dietary behaviour less daunting for consumers. The provision of simple, easy to follow recipes, may encourage consumers to prepare meals from scratch however barriers related to time and effort were still evident.

Consumer testing was a crucial element of the present project. Many healthy eating resources are available to the public and health professionals and it was important to garner the opinions of these groups to allow focussed objective revision of the resource to increase the acceptability and ultimately the uptake and effective implementation of the resource. The testing highlighted deficits in the knowledge of consumers and some health professionals, on the correct composition of a healthy diet. The role of healthy eating in obesity and disease prevention was also poorly recognised. The benefits of a healthy diet need to be emphasised to consumers and ongoing training and education of health professionals which includes information on what a healthy balanced diet actually looks like in practice, is needed.

The *eatwell week* shows promise as a resource to support implementation of the principles of the eatwell plate and supports Government priorities and policies for health. However further development is required before this resource can be made available to both health professionals and consumers

7. Suggestions for Future Research

Little progress has been made towards the achievement of the Scottish Dietary Targets, and work to facilitate their achievement is important and must continue. Further research is needed to establish whether or not the *eatwell week* can improve the food choices and nutrient intakes of consumers.

Cost is frequently cited as a barrier to healthy eating and research to determine the cost of implementing the *eatwell week* would be of value.

Health professionals who participated in focus group testing felt that the *eatwell* menu was not suitable for use with different cultural and ethnic groups. Further research could investigate how the menu could be adapted or the development of alternative menus to address ethnic and cultural needs explored.

Participants in the focus group testing of the *eatwell week* felt that the resource may be suitable for use in schools to help overcome the lack of food skills and nutritional knowledge displayed by many young people. Research should examine the current nutrition knowledge and cooking abilities of students in secondary schools to determine the potential role of the *eatwell week*, and also the capabilities of younger people with regard to implementing the resource in future.

It was also felt by some participants that a one-week menu was short. Consumers were unable to substitute meals, even though advice on this was provided. Further research could explore the development of four “seasonal” *eatwell weeks* which may encourage both sustained use of the resource and use of seasonal foods.

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