Public Health England

Protecting and improving the nation's health

ERG/Eatwell plate/15/18

External reference group – eatwell plate

Paper for information: includes an update of the modelling exercise

Agenda item 4

This paper provides an update on the modelling exercise to date to support considerations around any update of the eatwell plate.

The reference group is invited to:

- note the update from PHE regarding the modelling work
- the ERG is asked to consider how PHE should look to develop a single revised eatwell plate model for further consumer testing.

Updating the eatwell plate

Background

1. The data presented in this paper does not represent the view of PHE on the outcome for the refreshed eatwell national model. Rather, it simply presents the results of the different modelling approaches that have been used which will help to inform such a decision.

2. The Scientific Advisory Committee on Nutrition published the draft 'Carbohydrates and Health' report[1] in last year, which draws conclusions that indicate a need to revise dietary reference values for sugars and fibre. Although the outcome is not concluded, it is appropriate to assess potential implications (should the conclusion remain unchanged) for the eatwell plate and associated healthy eating messaging in order to be able to respond in a timely manner when the final SACN publication is made available.

3. PHE has been conducting in-house and externally commissioned modelling work to inform the proportion of the food categories depicted within the eatwell plate. This paper provides a summary of the outcome of this work to date.

Modelling based on movement from current dietary intakes to potentially revised Dietary Reference Values using the National Diet and Nutrition Survey

4. PHE has concluded its modelling using the NDNS (rolling programme years 1-3) based on movement from current dietary intakes to potentially revised DRVs to inform the proportion of the food groups in the eatwell plate.

5. The proposed SACN definition of 'free sugar' was used and the existing survey data was amended to reflect this. There are many ways to achieve reductions in sugar; for the purposes of the current modelling three stages were taken to reduce the free sugar contribution to 5% of total energy per person per day:

    1. Foods high in free sugars (soft drinks, sugar confectionery and confectionery) were removed entirely
    2. Breakfast cereals and biscuits were substituted for an alternative in the same sub food group, which was lower in free sugars
    3. Consumption of certain foods high in free sugars (ice cream, puddings, buns, cakes, pastries, fruit pies, biscuits, yogurt and sugar) were halved, as a pragmatic approach

6. In order to adhere to the DRV for energy, commonly consumed fruit and vegetables, brown bread and low fat spread were added back into the NDNS dataset. In order to return energy back to the original levels, it was necessary to add an additional 100g of fruit and vegetables and 46g of brown bread with low fat polyunsaturated spread per day.

[1] Scientific Advisory Committee on Nutrition (2014) Draft SACN Carbohydrates and Health Report https://www.gov.uk/government/consultations/consultation-on-draft-sacn-carb ohydrates-and-health-report

7. The final percentage of energy derived from free sugar was 4.9% of total energy.

8. Adopting the approaches which were used to develop the original national plate model in 1994, the outcome of the current modelling produced the following percentages for the existing eatwell food groups, as illustrated graphically in figure 1.

eatwell food group	**Segment size %**
Starchy foods	28.5
Milk and dairy foods	10.9
Foods high in fat and/or sugar	5.9
Meat, fish, eggs, beans and other protein sources	18.5
Fruit and vegetables	36.3

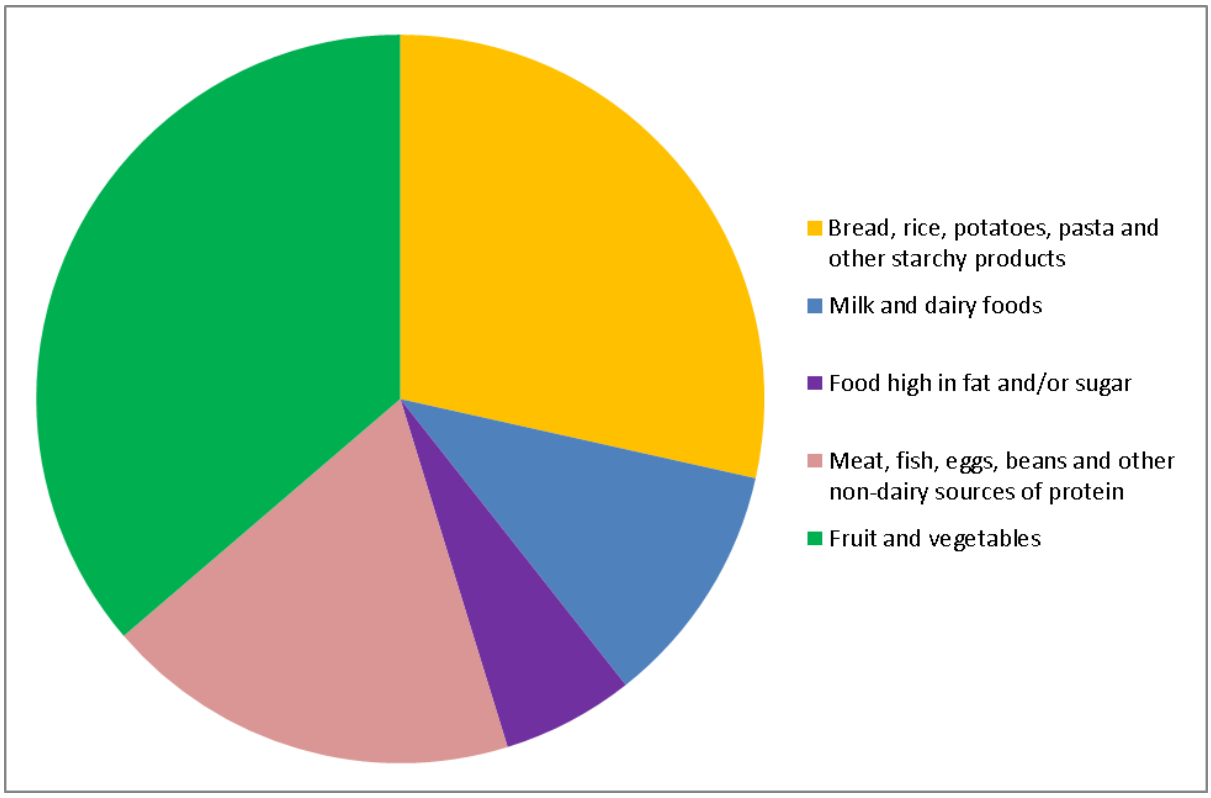

Figure 1. Illustration of the eatwell plate modelled from movement of the current dietary intakes to potentially revised Dietary Reference Values using the National Diet and Nutrition Survey.

Modelling of the National Diet and Nutrition Survey using Linear Programming

9. At the time of preparing the meeting papers for the external reference group the data from this modelling exercise was unavailable. The outcome of this work will be presented at the meeting.

Modelling of the Food Standards Scotland eatwell week

10. PHE and Food Standards Scotland have completed the data re-modelling of the FSA Scotland eatwell week (a week's worth of recipes based on commonly eaten foods to help consumers understand a healthy balanced diet).

11. This involved manipulating the existing data to design a menu based on 5% Non-Milk Extrinsic Sugars, which was considered to be sufficiently equivalent to free sugars and a fibre content equivalent to the SACN draft recommendation of 30g AOAC fibre.

12. Each food in the menu was disaggregated into component ingredients. The disaggregated ingredients were assigned to one of the five current eatwell plate food groups or a 6th miscellaneous group. The only exception to this, were foods such as cakes and biscuits, which were assigned in their totality to the 'foods and drinks high in fat and/or sugar' segment of the plate. In order to break down the composite foods into component ingredients it was necessary to have the corresponding recipe information; this obtained using the existing recipes underpinning the menus, but in some cases manufacturer information and information from McCance & Widdowson, The Composition of Foods, 7th edition was utilised.

13. The foods and ingredients were assigned to the food groups using the previous classification model for the Balance for Good Health. However, in the current analytical work all composite foods (with the exception of cakes and biscuits) were disaggregated.

14. The outcome of the modelling produced the following percentages for the current eatwell food groups, as illustrated graphically in figure 2. Note that the original FSS eatwell week contained a greater volume of fruit and vegetables, which is therefore reflected in this 5% NMES model.

eatwell food group	**Segment size %**
Starchy foods	29
Milk and dairy foods	10
Foods high in fat and/or sugar	6
Meat, fish, eggs, beans and other protein sources	12
Fruit and vegetables	43

15. The limitations to this approach include that this is based on a one week menu for one person so there is a very limited opportunity to consider a wider range of foods within each food group. The majority of foods are based on homemade recipes, which may not be representative of consumer habits in the UK.

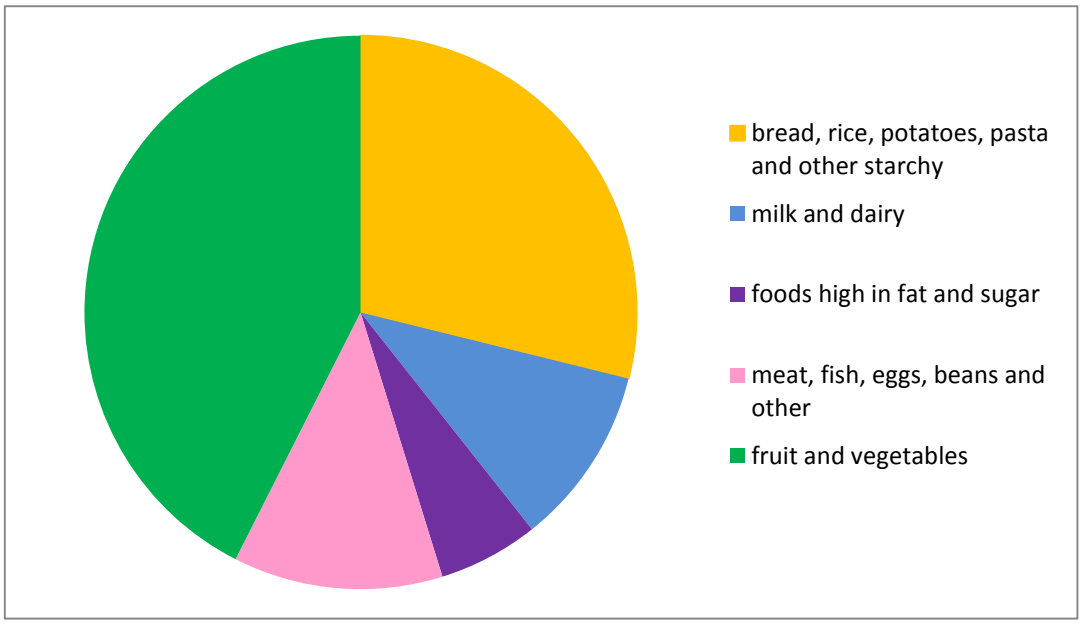

Figure 2. Illustration of the eatwell plate modelled from the Food Standards Scotland eatwell week example menu.

Modelling based on the PHE healthier and more sustainable catering example menus

16. PHE has concluded its data modelling based on the PHE healthier and more sustainable catering example menus.

17. These menus meet the Dietary Reference Values (DRVs) for energy and nutrients for the UK population. For the purposes of this analysis a mixed adults menu, based on more than 30g of fibre and less than 5 % free sugar, was used. The same procedure as detailed in paragraphs 12 & 13 was conducted.

18. Portion sizes previously assigned to the foods in this menu were used.

19. Because the PHE healthier and more sustainable catering example menus are cafeteria style menus that include a number of options, an assumed percentage uptake figure (i.e. relative popularity) was assigned to each option. This was based primarily on percentage uptake values used in previous menus[2].

20. The portion sizes previously assigned to the foods in the menu were used.

[2] Daniels L. (2007) Example Menus for Adults. Food Standards Agency. Available at: http://collections.europarchive.org/tna/20100927130941/http://food.gov.uk/multimedia/pdfs/adultmenus.pdf

21. The outcome of the modelling produced the following percentages for the current eatwell food groups, as illustrated graphically in figure 3.

eatwell food group	Segment size %
Starchy foods	24
Milk and dairy foods	21
Foods high in fat and/or sugar	5
Meat, fish, eggs, beans and other protein sources	11
Fruit and vegetables	39

22. The limitations to this approach include; that this is based on a 1 week menu, so there is a somewhat limited range of different types of food; assumptions were made on the uptakes of the different menu options; nearly all of the foods were based on homemade recipes with only a few foods based on an average of a manufactured product data, which may not be representative of consumer habits in the UK.

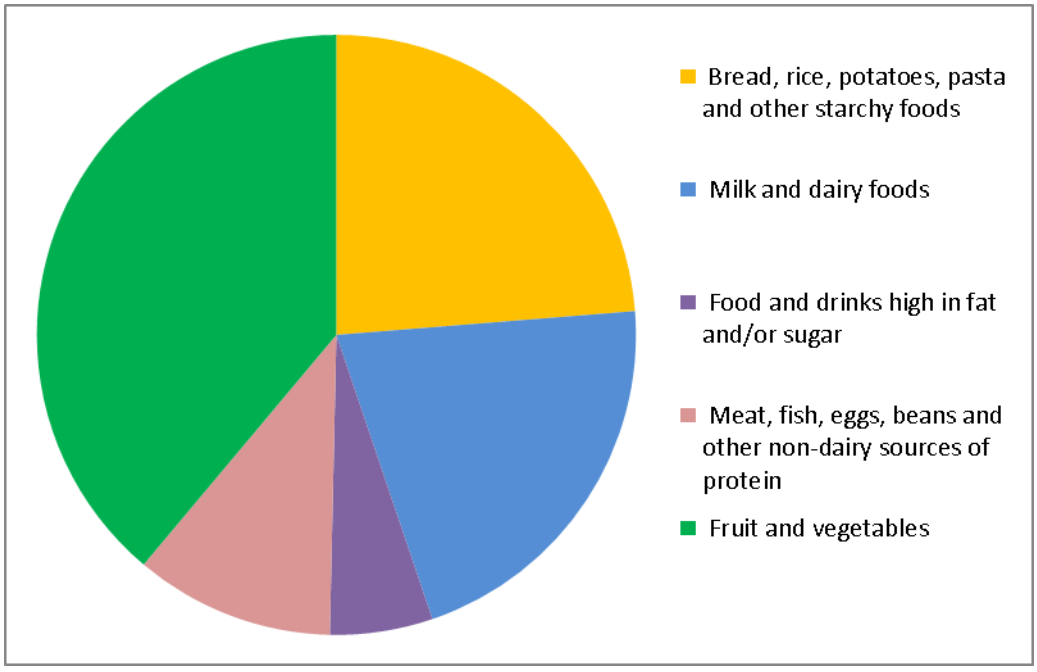

Figure 3. Illustration of the eatwell plate modelled from the PHE catering menus.

23. It is clear that different modelling approaches and assumptions provide different outcomes all of which achieve DRV's consistent with current healthy eating messages; there are many different combinations of foods that provide a healthy balanced diet.

24. In light of the feedback received so far, the ERG is asked to consider how PHE should look to develop a single revised eatwell plate model for further consumer testing.

Portion sizes

25. To deliver the various modelling approaches described in this paper, it was necessary to assign portion sizes to the foods and dishes. In effect, these are largely based on typically consumed volumes and relate to the MAFF Food Portion Sizes publication.

26. Given that the majority of these portions are based on typically consumed information (which is somewhat dated) and the wide variation in nutrient content of an individual food type eg cheese, sausages, cottage pie; the ERG is asked to consider how relevant this information would be in helping people to meet dietary recommendations.

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