Public Health England

Food Standards Agency
food.gov.uk

National Diet and Nutrition Survey

Results from Years 7 and 8 (combined) of the Rolling Programme (2014/2015 to 2015/2016)

A survey carried out on behalf of Public Health England and the Food Standards Agency

NatCen
Social Research that works for society

MRC Elsie Widdowson Laboratory

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-leading science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health and Social Care, and a distinct delivery organisation with operational autonomy. We provide government, local government, the NHS, Parliament, industry and the public with evidence-based professional, scientific and delivery expertise and support.

Public Health England
Wellington House
133-155 Waterloo Road
London SE1 8UG
Tel: 020 7654 8000
www.gov.uk/phe
Twitter: @PHE_uk
Facebook: www.facebook.com/PublicHealthEngland

Prepared by: Caireen Roberts, Toni Steer, Natalie Maplethorpe, Lorna Cox, Sarah Meadows, Sonja Nicholson, Polly Page, and Gillian Swan.
For queries relating to this document, please contact: phe.enquiries@phe.gov.uk

Published: March 2018
PHE publications
gateway number: 2017851

PHE supports the UN
Sustainable Development Goals

Authors' acknowledgements

We would like to thank everyone who contributed to the survey and the production of this report. In particular, we would like to thank:

Colleagues at NatCen: Beverley Bates, Steve Edwards, Lynne Gold, Coral Lawson and Keeva Rooney.

Members of the teams at MRC Elsie Widdowson Laboratory (formerly MRC Human Nutrition Research): Suzanna Abraham, Birdem Amoutzopoulos, Iain Bayes, Veronica Bell, Karen Chamberlain, Darren Cole, David Collins, Yvette Edwards, Sarah Elsey, Clare Evans, Sarah Gibbings, Kate Guberg, Anna Harvey, Lindi Holmes, Martha Hughes, Alison James, Dagmar Koller, Abhilash Krishnankutty, Rachael Mack, Tabasum Makhdoomi, Amanda Mckillion, Ann Prentice, Sumantra Ray, Edyta Telega, Kirsty Trigg, Jenny Winster, Stephen Young and Nida Ziauddeen.

Colleagues at Centers for Disease Control and Prevention laboratories for carrying out blood folate analyses.

Colleagues at Addenbrooke's for carrying out blood analyses.

Professor Elaine Gunter (Specimen Solutions, LLC) for an independent review of the laboratory procedures and analyses.

Members of the NDNS Project Board: Professor Julie Lovegrove and Professor Hilary Powers, representing the Scientific Advisory Committee on Nutrition.

Staff at Public Health England, in particular: Professor Louis Levy, Mark Bush, Natasha Powell, Bethany Knowles and Dr Alison Tedstone.

Staff at the Food Standards Agency: Dr Joseph Shavila, Dr Clifton Gay, Robin Clifford.

Staff at Food Standards Scotland: Anne Milne and Heather Peace.

Staff at the Food Standards Agency in Northern Ireland: Joanne Casey.

Staff at the Welsh Government: Dr Sarah Rowles and Dr Chris Roberts.

Notes to tables

1. The data used in the report have been weighted. The weighting strategy is described in appendix B.

2. The NDNS Rolling Programme (RP) requires weights to adjust for differences in sample selection and response. The weights adjust for:

- differential selection probabilities of addresses, households and individuals
- non-response to the individual questionnaire
- non-response to the nurse visit
- non-response to providing a blood sample

3. The data were analysed with the "survey"[1,2] package in the statistical software R (version 3.3.2).

4. The following conventions have been used in tables:

- – no observations (zero value)
- 0 non-zero values of less than 0.5% and thus rounded to zero
- [ ] unless stated otherwise data and bases for a variable with a cell size between 30-49 are presented in square brackets

5. Values for means, medians, percentiles, standard deviations and standard errors are shown to an appropriate number of decimal places. For reasons of space, standard error has been abbreviated to SE and standard deviation to SD.

6. The group to whom each table refers is stated at the upper left corner of the table.

7. The term 'significant' refers to statistical significance (at the 95% level) and is not intended to imply substantive importance.

[1] T. Lumley (2014) "survey: analysis of complex survey samples". R package version 3.0.
[2] T. Lumley (2004) Analysis of complex survey samples. Journal of Statistical Software 9(1): 1-19.

Contents

1 Introduction

1.1 Background

The National Diet and Nutrition Survey Rolling Programme (NDNS RP) is a continuous programme of fieldwork designed to assess the diet, nutrient intake and nutritional status of the general population aged 1.5 years and over living in private households in the UK. The core NDNS RP is jointly funded by Public Health England (PHE)[1] and the UK Food Standards Agency (FSA). The NDNS RP is carried out by a consortium comprising NatCen Social Research (NatCen) and the Medical Research Council Elsie Widdowson Laboratory (MRC EWL)[2] with fieldwork in Northern Ireland carried out by the Northern Ireland Statistics and Research Agency (NISRA).

The NDNS provides the only source of high quality, nationally representative UK data on the types and quantities of foods consumed by individuals, from which estimates of nutrient intake for the population are derived.[3] Results are used by Government to develop policy and monitor progress toward diet and nutrition objectives of UK Health Departments, for example work to tackle obesity and monitor progress towards a healthy, balanced diet as visually depicted in the Eatwell Guide.[4] The NDNS provides an important source of evidence underpinning the Scientific Advisory Committee on Nutrition's (SACN) work relating to national nutrition policy. The food consumption data are also used by the FSA to assess exposure to chemicals in food, as part of the risk assessment and communication process in response to a food emergency or to inform negotiations on setting regulatory limits for contaminants.

The NDNS programme began in 1992 as a series of cross-sectional surveys designed to be representative of the UK population, each covering a different age group: pre-school children (aged 1.5 to 4.5 years);[5] young people (aged 4 to 18 years);[6] adults (aged 19 to 64 years)[7] and older adults (aged 65 years and over).[8] Since 2008, the NDNS has run as a rolling programme (RP) covering adults and children aged 1.5 years and over. Methods used in the NDNS are kept under review to ensure they remain the best practical methods available.

1.2 Details in this report

This report presents an overview of food consumption, nutrient intake and nutritional status for the UK in Years 7 and 8 (combined) (2014/15-2015/16) of the NDNS RP.[9] The sample is drawn from all 4 UK countries, and is designed to be nationally representative. During this period, recruitment in both Wales[10] and Northern Ireland[11] was boosted to 200 participants per year in order to achieve country-specific, representative dietary health data.[12] Background information on the survey, including the sample and methodology, is provided in chapter 6 and further details can be found in the appendices.

Excel tables provide data for Years 7 and 8 (combined) and the previous paired years: Years 1 and 2 (combined) (2008/09-2009/10); Years 3 and 4 (combined) (2010/11-2011/12); Years 5 and 6 (combined) (2012/13-2013/14). Statistical comparisons have been performed for key foods and nutrients (listed below) to analyse differences over time in respect of the first 2 years of the RP (Years 1 and 2 (combined)) against the latest data (Years 7 and 8 (combined)) and against the interim paired years. No comparisons have been performed for Years 7 and 8 (combined) against the interim paired years:

- total energy intake (including energy from alcohol) and food energy intake (excluding energy from alcohol) (MJ/day and kcal/day)
- saturated fatty acids intake (g/day, % total energy and % food energy)
- free sugars intake (g/day, % total energy and % food energy)
- AOAC fibre intake (g/day)
- "5 A Day" fruit and vegetable portions (portions/day)[13] and % achieving "5 A Day" fruit and vegetable portions
- red and processed meat consumption (g/day)
- sugar-sweetened soft drinks consumption (g/day)

See chapter 6 of this report for more information on the statistical analysis.

The commentary in this report includes the following:

1.2.1 Free sugars and AOAC fibre intakes for all age groups (chapter 2)

In previous years, the NDNS RP reports included descriptive statistics for non-milk extrinsic sugars (NMES) intake (g/day, % total energy and % food energy) as well as non-starch polysaccharides (NSP) intake (g/day). In 2015, SACN published its report on Carbohydrates and Health, having been asked to examine the latest evidence on links between consumption of carbohydrates,
including sugars, starch and fibre and a range of health outcomes to ensure that the dietary reference values (DRVs) reflect the current evidence base.[14] In light of its findings, SACN recommended that the definition of free sugars and the AOAC definition of fibre should be adopted in the UK, replacing NMES and NSP respectively.

This report presents intakes of free sugars and AOAC fibre for all paired years of the NDNS RP.[15] Commentary is provided for all age groups. Further details of the methodology for determining free sugars and AOAC fibre values in the NDNS RP are provided in chapter 2.

1.2.2 Key foods consumed and nutrient intakes for adults aged 65 to 74 years and 75 years and over (chapter 3)

For the first time in the NDNS RP, results for food and nutrient intakes are presented for the 65 years and over age group split into those aged 65 to 74 years and those aged 75 years and over. Due to small cell sizes, results for blood analytes have not been split into these age groups, hence no commentary has been provided for these data.

1.2.3 Blood folate (chapter 4)

This report presents the latest results Years 5 and 6 (combined) (2012/13-2013/14) and Years 7 and 8 (combined) (2014/15-2015/16) alongside previous paired years for red blood cell folate, serum folate and unmetabolised (free) folic acid in serum.[16] Commentary is provided for all age groups including women of childbearing age (16 to 49 years).

1.2.4 Urinary iodine (chapter 5)

Urinary iodine measurement was introduced in Year 6 (2013/14) of the NDNS RP. Commentary in this report is based on three years data: Year 6 only and Years 7 and 8 (combined) for all age groups including women of childbearing age (16 to 49 years).

2 Free sugars and AOAC fibre intake

2.1 Introduction

2.1.1 Background to free sugars and AOAC fibre in NDNS RP

In 2015, the Scientific Advisory Committee on Nutrition (SACN) published its review of the latest evidence on carbohydrates and health.[14] As part of this review SACN recommended that free sugars and AOAC fibre, as defined in its report, should be adopted in the UK, replacing non-milk extrinsic sugars (NMES) and non-starch polysaccharides (NSP) on which previous government recommendations were based and which had been included in previous NDNS RP reports. This report provides the first UK population data on intakes of free sugars and AOAC fibre.

In order to use free sugars and AOAC fibre for nutrition monitoring it was necessary to populate the NDNS Nutrient Databank (see appendix A) with values for both nutrients so that intakes could be calculated. This required a programme of updates to the databank (see appendix AA).

The definition of free sugars as described by SACN includes all monosaccharides and disaccharides added to foods by the manufacturer, cook or consumer, plus sugars naturally present in honey, syrups and unsweetened fruit juices. Under this definition, lactose (milk sugar) when naturally present in milk and milk products and sugars contained within the cellular structure of foods (particularly fruits and vegetables) are excluded.[14] The definition described by SACN was expanded into a more detailed definition to enable the free sugar content of foods in the NDNS RP to be calculated.[17] Included in the definition of free sugars are:

- all monosaccharides and disaccharides added to foods by the manufacturer, cook or consumer, plus sugars naturally present in honey, syrups and unsweetened fruit juices
- fruit purees and pastes and vegetables in pureed and juice form

Excluded from the definition of free sugars are:

- lactose (milk sugar) when naturally present in milk and milk products
- sugars contained within the cellular structure of foods (particularly fruits and vegetables). This applies to sugars naturally present in fresh and processed (dried, stewed, canned and frozen) fruit and vegetables
- The definition of free sugars is similar to that for NMES. The main difference is that for NMES 50% of sugars in canned, stewed, dried or preserved fruits was taken as extrinsic (NMES) and 50% intrinsic.[18]

More detail on the methodology for updating the Nutrient Databank and the way in which the definition of free sugars has been operationalised for this report is provided in appendix AA.

SACN recommended that the average population intake of free sugars should not exceed 5% of total energy intake for adults and children aged 2 years and over. The previous dietary recommendation for NMES was set at no more than 10% of total energy intake.

In relation to fibre; AOAC fibre is the term used to describe fibre measured by the American Association of Analytical Chemists (AOAC) methods. AOAC fibre includes resistant starch and lignin in the estimation of total fibre as well as NSP.[19] To populate AOAC fibre values in the NDNS Nutrient Databank a combination of AOAC fibre analytical data from several UK nutrient analysis projects were used as well as NSP conversion factors. Further details on AOAC fibre and its estimation is provided in appendix AA.

The new recommendation, set out by SACN, for dietary fibre (using the AOAC methods) is:

- 30g/day for adults
- 25g/day for older children aged 11 to 16 years
- 20g/day for children aged 5 to 11 years
- 15g/day for children aged 2 to 5 years

The previous dietary reference value of 18g per day of NSP for adults equates to around 23-24g per day of dietary fibre if analysed using AOAC methods and therefore 30g/day represents an increase in the recommendation for dietary fibre.

2.1.2 Overview of chapter

This chapter presents the results for free sugars and AOAC fibre intakes for the standard NDNS RP age groups and includes sex-combined and sex-split results.[20] The following commentary is supported by accompanying Excel tables providing data for Years 7 and 8 (combined) and the previous paired years: Years 1 and 2 (combined) (2008/09-2009/10), Years 3 and 4 (combined) (2010/11-2011/12), Years 5 and 6 (combined) (2012/13-2013/14). Statistical comparisons have been performed to analyse differences over time in respect of the first 2 years of the RP (Years 1 and 2 (combined)) against the latest data (Years 7 and 8 (combined)) and against the interim paired years.

2.2 Free sugars

Table A provides a summary of free sugars intake in Years 7 and 8 (combined) (2014/15-2015/16). In all age groups, mean intake of free sugars exceeded the government recommendation of providing no more than 5% of daily total energy intake for those aged 2 years and over. In children, girls aged 11 to 18 years had the highest free sugar intake as a percentage of total energy (14.4% of total energy); whilst children aged 1.5 to 3 years had the

lowest intake (11.3%).[21] In adults, mean intake of free sugars as a percentage of total energy intake was 11.1% and 11.2% respectively for men and women aged 19 to 64 years and 12.1% and 10.4% respectively for men and women aged 65 years and over.

Table A Average daily intake of free sugars for NDNS RP UK Years 7 and 8 (combined) (2014/15-2015/16)

	NDNS age groups (years)								
	1.5-3	4-10		11-18		19-64		65+	
	sex-combined	Boys	Girls	Boys	Girls	Men	Women	Men	Women
Free sugars intake (g/day)	32.6	54.5	49.9	71.6	62.4	64.3	50.0	61.4	40.1
Free sugars intake (% total energy)	11.3	13.6	13.4	13.9	14.4	11.1	11.2	12.1	10.4
% with intakes below or equal to 5% total energy[a]	13	3	1	5	6	13	13	9	16
Bases (unweighted)	*250*	*276*	*238*	*270*	*272*	*450*	*632*	*141*	*194*

[a] SACN recommendation that free sugars provides no more than 5% of daily total energy intake for those aged 2 years and over

Boys and girls aged 4 to 10 years and 11 to 18 years and men aged 19 to 64 years all had a significantly lower intake of free sugars as a percentage of total energy intake in Years 7 and 8 (combined) compared with Years 1 and 2 (combined). [22]

The percentage meeting the recommendation of no more than 5% of daily total energy intake from free sugars was 13% for children aged 1.5 to 3 years, 2% of children aged 4 to 10 years and 5% of children 11 to 18 years. 13% of adults aged 19 to 64 years and 13% of adults aged 65 years and over met the recommendation.

Table 3.7

The main source of free sugars in children aged 1.5 to 3 years and 4 to 10 years was ‘cereal and cereal products’ (31% and 33% respectively), followed by ‘non-alcoholic beverages - soft drinks and fruit juice’ (21% and 22% respectively) and ‘sugar, preserves and confectionery’ (20% and 23% respectively). For children aged 11 to 18 years ‘non-alcoholic beverages ‘ provided the main source of free sugars (33%), followed by ‘cereal and cereal products’ (29%) and ‘sugar, preserves and confectionery’ (21%). Within the ‘non-alcoholic beverages’ group fruit juice contributed 12%, 11% and 10% to free sugar intake in children aged 1.5 to 3 years, 4 to 10 years and 11 to 18 years respectively. ‘Soft drinks, not low calorie’ provided 7%, 10% and 22% respectively in these age groups.

The main sources of free sugars in adults aged 19 to 64 years were ‘sugar, preserves and confectionery’ (25%),‘cereal and cereal products’ (24%) and ‘non-alcoholic beverages’ (21%).

Table 6.7

2.3 AOAC fibre

Table B provides a summary of AOAC fibre intake in Years 7 and 8 (combined). In all age groups, the mean intake of AOAC fibre was below the new recommendations set by SACN and adopted by Government.[23]

For children aged 1.5 to 3 years, 4 to 10 years and 11 to 18 years, mean intakes were 10.3g, 14.0g and 15.3g respectively. Children aged 4 to 10 years and 11 to 18 years had a mean intake of AOAC fibre which was significantly lower in Years 7 and 8 (combined) compared with Years 1 and 2 (combined).[24]

For adults aged 19 to 64 years and 65 years and over, mean intakes were 19.0g and 17.5g respectively. No significant differences were seen between paired Years 7 and 8 (combined) and Years 1 and 2 (combined).

Table B Average daily intake of AOAC fibre for NDNS RP UK Years 7 and 8 (combined) (2014/15-2015/16)

	NDNS age groups (years)								
	1.5-3	4-10		11-18		19-64		65+	
	sex-combined	Boys	Girls	Boys	Girls	Men	Women	Men	Women
AOAC fibre intake (g/day)	10.3	14.5	13.5	16.5	14.1	20.7	17.4	19.0	16.4
% meeting the AOAC fibre recommendation[a]	10	11	9	6	2	13	4	9	4
Bases (unweighted)	*250*	*276*	*238*	*270*	*272*	*450*	*632*	*141*	*194*

[a] SACN AOAC fibre recommendations: 30g/day for adults; 25g/day for older children aged 11-16 years; 20g/day for the 5-11 year age group; 15g/day for the 2-5 year age group

The percentage of children meeting the AOAC fibre recommendation was 10% of those aged 1.5 to 3 years and 4 to 10 years and 4% of those 11 to 18 years. 9% of adults aged 19 to 64 years and 7% of adults aged 65 years and over met the recommendation. ‘Cereals and cereal products’ were the main source of AOAC fibre ranging from 38% to 44% of intake across the age groups, followed by ‘vegetables and potatoes’ (21% to 32%) and ‘fruit’ (6% to 16%).

Tables 3.8 and 6.8

3 Food consumption and nutrient intakes for adults aged 65 to 74 years and 75 years and over

3.1 Introduction

This chapter presents key findings for food consumption and nutrient intakes for older people for Years 7 and 8 (combined) (2014/15 – 2015/16) of the NDNS RP. The 65 years and over age group has been split into 65 to 74 years and 75 years and over, so that these 2 age groups can be considered in more detail. Factors associated with ageing, such as poor dentition, reduced mobility, chronic disease, the use of medicines and other social factors may influence nutrient intake and nutritional status and therefore may increase nutritional vulnerabilities in this age group.[25] In the UK the proportion of the population aged 65 years and over continues to increase. Currently 18% (around 11.8 million) of the UK population are aged 65 years and over, of which those aged 75 years and over make up 8% of the UK population.[26]

The following commentary is supported by accompanying Excel tables providing data for Years 7 and 8 (combined) and the previous paired years: Years 1 and 2 (combined) (2008/09-2009/10), Years 3 and 4 (combined) (2010/11-2011/12), Years 5 and 6 (combined) (2012/13-2013/14).

As with the other age groups, statistical comparisons have been performed to analyse differences over time in respect of the first 2 years of the RP (Years 1 and 2 (combined)) against the latest data (Years 7 and 8 (combined)) and against the interim paired years. No statistical comparisons have been performed on differences between the two older adult age groups. More information on the statistical methods for the comparison of dietary intake can be found in chapter 6.

It is important to note that caution should be applied in drawing conclusions about some of the data because of small cell sizes in the split age groups for some paired years. The age distributions in the split older adult age groups may also influence the results. The 75 years and over age group may be particularly affected as differences in the proportion of very elderly adults (aged 85 years and over) in the sample between paired years may affect the reliability of comparisons over time.

3.2 Dental health

Some information on dental health is captured in the NDNS RP interview. Participants are classified as being edentate if they report having none of their own teeth. Dentate participants are those who report having any of their own teeth. In Years 7 and 8 (combined), 12% of adults aged 65 to 74 years and 32% aged 75 years and over were edentate.

Wearing dentures was associated with difficulty in chewing regardless of whether participants had no teeth or some teeth. In Years 7 and 8 (combined) the majority (96%) of edentate participants aged 65 years and over wore dentures while 36% of dentate participants wore dentures. The proportion who said they had difficulty chewing was similar for edentate and dentate participants who wore dentures (46% and 40% respectively). In contrast, only 12% of all adults aged 65 years and over who were dentate and did not wear dentures said they had difficulty chewing

.

3.3 Foods consumed

Table C provides a summary of the consumption of selected foods[27] for adults aged 65 to 74 years and 75 years and over in Years 7 and 8 (combined).

Table C Average daily intake of selected foods, for NDNS RP UK Years 7 and 8 (combined) (2014/15-2015/16)

Food	NDNS age group (years)			
	65-74		75+	
	Men	Women	Men	Women
"5 A Day" portions (portions/day)[a]	4.3	4.3	3.8	3.2
% achieving "5 A Day"	31	32	18	20
Oily fish g/day[b]	17	12	12	8
Red and processed meat g/day[c]	73	54	66	43
Sugar-sweetened soft drinks g/day[d]	41	51	43	23
Bases (unweighted)	*71*	*110*	*70*	*84*

[a] To calculate "5 A Day" portions of fruit and vegetables see appendix A.
[b] Oily fish included anchovies, carp, trout, mackerel, herring, jack fish, pilchards, salmon (including canned), sardines, sprats, swordfish, tuna (fresh only) and whitebait.
[c] Red and processed meat included beef, lamb, pork, sausages, burgers and kebabs, offal, processed red meat and other red meat.
[d] Sugar-sweetened soft drinks included carbonated and still, and concentrated soft drinks made-up.

- mean consumption of fruit and vegetables in Years 7 and 8 (combined) was 4.3 portions per day for adults aged 65 to 74 years and 3.4 portions per day for adults aged 75 years and over. Mean consumption for women aged 75 years and over was significantly lower in Years 7 and 8 (combined) than in Years 1 and 2 (combined) (3.2 portions and 4.0 portions respectively), but a significant difference

was not seen for men or for the those aged 65 to 74 years. Thirty-one per cent of men and 32% of women aged 65 to 74 years, 18% of men and 20% of women aged 75 years and over met the "5 A Day" recommendation. There were no significant differences in the proportion meeting the 5 A Day recommendation between Years 7 and 8 (combined) compared with Years 1 and 2 (combined) for any age-sex group

- the mean daily intake of oily fish is shown in table C and indicated that consumption of oily fish in both older age groups was below the recommended one portion (140g) per week. This was also the case for intakes in previous paired years
- mean consumption of red and processed meat for men aged 75 years and over (66g), women aged 65 to 74 years (54g) and 75 years and over (43g) met the current recommendation that adult average intakes should not exceed 70g per day.[28] However, mean consumption for men aged 65 to 74 years (73g) exceeded the recommendation. There were no significant differences between Years 7 and 8 (combined) and Years 1 and 2 (combined)

Tables 7.3, 7.5 and 7.7

3.4 Nutrient intakes

Table D provides a summary of the reported total energy intake for adults aged 65 to 74 years and 75 years and over in Years 7 and 8 (combined). It should be borne in mind that misreporting of food consumption (generally underreporting) occurs in the NDNS RP as in all dietary surveys. There is evidence that underreporting occurs in all age groups, including those aged 65 years and over.[29]

Table D Average daily total energy intake for NDNS RP UK Years 7 and 8 (combined) (2014/15-2015/16)

Total energy[a]	NDNS age groups (years)			
	65-74		75+	
	Men	Women	Men	Women
MJ	8.16	6.24	7.67	5.66
kcal	1940	1483	1824	1344
Bases (unweighted)	*71*	*110*	*70*	*84*

[a] SACN EAR recommendations: Men 65 to 74 years 9.8MJ (2342kcal)/day, men 75 years and over 9.6MJ (2294kcal)/day; women 65 to 74 years 8.0MJ (1912kcal)/day; women 75 years and over 7.7MJ (1840kcal)/day.

For women aged 75 years and over, total energy intake in Years 7 and 8 (combined) (5.66 MJ) was significantly lower than in Years 1 and 2 (combined) (6.34 MJ). Mean daily energy intake was below the estimated average requirement (EAR)[30] for all age-sex groups across all the paired years.

Table 2.1

Table E provides a summary of the intake of selected macronutrients for adults aged 65 to 74 years and 75 years and over in Years 7 and 8 (combined). The Dietary Reference Values (DRVs)[14,31] for key macronutrients are shown in table 3.1 and are referred to as 'recommendations' in the rest of this chapter. They indicate the average or the maximum contribution that these nutrients should make to the population average intakes.

Table E Average daily intake of selected macronutrients, for NDNS RP UK Years 7 and 8 (combined) (2014/15-2015/16)

Macronutrient	NDNS age groups (years)			
	65-74		75+	
	Men	Women	Men	Women
Total fat (% food energy)	33.7	34.5	36.4	35.6
Saturated fatty acids (% food energy)	12.6	13.5	14.4	14.8
Trans fatty acids (% food energy)	0.5	0.6	0.6	0.7
Free sugars (% total energy)	11.8	10.4	12.5	10.4
AOAC fibre intake (g/day)	19.5	17.4	18.3	15.1
Bases (unweighted)	*71*	*110*	*70*	*84*

- mean intake of total fat for men and women aged 65 to 74 years met the recommendation of no more than 35% food energy (33.7% and 34.5% respectively). However, total fat intakes exceeded the recommendation for men and women aged 75 years and over (36.4% and 35.6% respectively)
- mean intake of saturated fatty acids exceeded the recommendation (no more than 11% food energy) in all older age/sex groups; 13.1% for adults aged 65 to 74 years and 14.6% for adults aged 75 years and over. For men aged 65 to 74 years, mean intake was significantly lower in Years 7 and 8 (combined) (12.6%) compared with Years 1 and 2 (combined) (13.7%). No statistical differences were seen across the paired years for those aged 75 years and over
- mean intake of *trans* fatty acids provided 0.5-0.7% of food energy for all age/sex groups, and thus met the recommendation (no more than 2% food energy)
- mean intakes of free sugars provided 10.4%-12.5% of total energy intake and exceeded the recommendation of no more than 5% of total energy intake in all older age and sex groups (refer to section 1.2 and chapter 2). For men aged 65 to 74 years free sugars intake was significantly higher in Years 7 and 8 (combined) compared with Years 1 and 2 (combined) (11.8% and 9.7% respectively). Women aged 75 years and over had a significantly lower intake of free sugars in Years 7 and 8 (combined) compared with Years 1 and 2 (combined) (10.4% and 12.4% respectively)
- mean AOAC fibre intakes fell below the recommendation of 30g per day for all older age/sex groups. Men aged 65 to 74 years had a significantly lower intake of AOAC fibre in Years 7 and 8 (combined) (19.5g) compared with that in Years 1 and 2 (combined) (22.1g) Tables 3.3, 3.4, 3.5, 3.7 and 3.8

For the older age/sex groups, the main contributors to energy and macronutrient intake in Years 7 and 8 (combined) are little changed from those in previous paired years.

Tables 6.1 - 6.8

71% of men aged 65 to 74 years and 52% of men aged 75 years and over reported consuming alcohol during the four-day recording period. For women, 46% aged 65 to 74 years and 33% aged 75 years and over reported consuming alcohol during the four-day recording period.

Table 4.1

Table F provides a summary of the intakes of micronutrients for adults aged 65 to 74 years and 75 years and over in Years 7 and 8 (combined). Mean intake is compared with the Reference Nutrient Intake (RNI)[32] and an estimate is made of the proportion with intakes below the Lower Reference Nutrient Intake (LRNI).[33] Published UK RNIs and LRNIs[31,34] are shown in tables 5.1 and 5.2.

- mean daily intakes of most vitamins from food sources were close to or above the RNI for all the older age/sex groups. 10% of women aged 75 years and over had intakes below the LRNI for vitamin A and 13% for riboflavin
- mean intakes of vitamin D (excluding supplements) were below the RNI in all older age/sex groups: 35% of the RNI for adults aged 65 to 74 years and 28% of the RNI for adults aged 75 years and over. Inclusion of intakes from dietary supplements brought the mean intake up to 60% and 53% of the RNI for adults aged 65 to 74 years and adults aged 75 years and over respectively
- mean intakes of minerals were close to or above the RNI for all older age/sex groups with the exception of magnesium (range 76% to 95% of RNI), potassium (64% to 91% of RNI) and selenium (58% to 72% of RNI). For selenium, a substantial proportion of older adults in all age/sex groups had intakes below the LRNI; 34% of men and 57% of women aged 65 to 74 years and 39% of men and 76% of women aged 75 years and over
- a higher proportion of women aged 75 years and over had intakes below the LRNI compared to the other older adult age/sex groups for most micronutrients (although no statistical comparisons have been performed). For example, 12% of women aged 75 years and over had intakes below the LRNI for iron and zinc compared with 8% and 3% respectively in women aged 65 to 74 years

Tables 5.3 – 5.13

For the older age/sex groups, the main contributors to micronutrient intake in Years 7 and 8 (combined) are little changed from those in previous paired years.

Tables 6.9 – 6.20

Table F Average daily intake as a percentage of the Reference Nutrient Intake (RNI) from food sources only and proportion of participants with average daily intakes below the Lower Reference Nutrient Intake (LRNI) for selected micronutrients, for NDNS RP UK Years 7 and 8 (combined) (2014/15-2015/16)

Micronutrients	NDNS age groups (years)			
	65-74		75+	
	Men	Women	Men	Women
Vitamin A				
Mean % RNI	125	151	191	149
% with intake below the LRNI	6	7	5	10
Riboflavin				
Mean % RNI	135	139	141	120
% with intake below the LRNI	1	7	3	13
Folate				
Mean % RNI	139	109	119	97
% with intake below the LRNI	0	3	3	8
Vitamin D				
Mean % RNI	39	32	33	25
Iron				
Mean % RNI	126	102	117	89
% with intake below the LRNI	0	8	2	12
Calcium				
Mean % RNI	127	109	126	99
% with intake below the LRNI	0	11	4	10
Magnesium				
Mean % RNI	95	85	82	76
% with intake below the LRNI	6	11	22	27
Potassium				
Mean % RNI	91	77	81	64
% with intake below the LRNI	4	22	16	34
Iodine				
Mean % RNI	131	112	136	96
% with intake below the LRNI	2	6	4	9
Selenium				
Mean % RNI	72	68	60	58
% with intake below the LRNI	34	57	39	76
Zinc				
Mean % RNI	95	108	91	94
% with intake below the LRNI	5	3	8	12
Bases (unweighted)	*71*	*110*	*70*	*84*

4 Blood folate status

4.1 Introduction

Folate in the diet comes from naturally occurring folates in foods and folic acid from fortified foods such as some breakfast cereals and from dietary supplements. Folate is involved in single carbon transfer (methylation) reactions, including those necessary for the synthesis of purines, pyrimidines, glycine and methionine. It is needed for DNA synthesis and thus for the production and maintenance of new cells; this particularly affects situations of rapid cell turnover. When folate deficiency impairs formation and maturation of red blood cells, macrocytic anaemia results. Increased folic acid intake through supplementation has been shown to reduce the risk of pregnancies being affected by neural tube defects (NTDs) if taken in the periconceptional period.

Folate status is monitored by the measurement of folates in red blood cells (RBCs) and in serum. RBC folate is usually a better indicator of long-term status than plasma or serum folate because it reflects body stores at the time of RBC folate synthesis. It is indicative of average folate status over the 120-day lifespan of the RBCs, whereas serum folate concentrations respond rapidly to change in dietary intake. The serum folate assay measures several naturally-occurring folate forms and also folic acid. Folic acid is the synthetic form of folate used in supplements and as a food-fortificant. It is present in the blood until it is metabolised by the body to other folate forms.

This chapter presents results for RBC folate, serum folate and unmetabolised (“free”) folic acid for the standard NDNS RP age groups and includes sex-combined and sex-split results. Results for women of childbearing age (16 to 49 years) are also presented. The following commentary is supported by accompanying Excel tables providing data for Years 7 and 8 (combined) and the previous paired years: Years 1 and 2 (combined) (2008/09-2009/10), Years 3 and 4 (combined) (2010/11-2011/12), Years 5 and 6 (combined) (20012/13-2013/14).

The population distributions of both RBC folate and serum folate are heavily skewed, meaning that statistics such as arithmetic mean and standard deviations which assume a normal distribution cannot be used to describe the population robustly. For reporting purposes, geometric means have been calculated as a more valid indicator of the central value.[35] This parameter is presented in the accompanying Excel tables with the 2.5 and 97.5 percentiles which are more appropriate descriptive statistics of skewed data.[36]

Folate status is assessed with reference to thresholds indicating deficiency or insufficiency. The proportion of each age/sex group with folate concentrations below WHO clinical thresholds indicating folate deficiency[37] are presented. For RBC folate this is 305nmol/L, for serum folate 13nmol/L indicating possible deficiency and 7nmol/L indicating clinical deficiency.

Population folate concentration distributions are included in the Excel tables so that data can be interpreted against these concentrations if a consensus regarding new biochemical thresholds for the UK should emerge in the future. For the UK population the threshold indicating biochemical folate insufficiency (increased risk of raised homocysteine) is estimated to lie between 450nmol/L and 550nmol/L for RBC folate and between 10nmol/L and 15nmol/ for serum folate.[38]

The assay-appropriate concentration in maternal RBCs above which the risk of NTDs is minimised is 748nmol/L.[39] The proportion of women of child-bearing age (16 to 49 years) below this threshold is presented.

4.2 Blood folate concentrations

Statistical comparisons have not been carried out on blood folate concentrations across the paired years. Both red blood cell and serum folate mean concentrations appeared to be lower in Years 7 and 8 (combined) compared with previous paired years in all age /sex groups and in some groups the data suggested a downward trend through the paired years. The percentages with concentrations below clinical thresholds indicating folate deficiency and risk of anaemia also appeared generally higher in Years 7 and 8 (combined) compared with previous paired years.

Commentary has not been included on the 1.5 to 3 year age group due to small cell sizes in this age group.

4.2.1 Red blood cell (RBC) folate

The mean RBC folate concentrations in Years 7 and 8 (combined) are shown in table G. RBC folate concentration below the WHO clinical threshold indicating risk of anaemia (305nmol/L) was found in 15% of boys aged 11 to 18 years, 28% of girls aged 11 to 18 years, 11% of women aged 19 to 64 years, 14% of men aged 65 years and over, and 10% of women aged 65 years and over.

In Years 7 and 8 (combined), 16% of women of childbearing age (16 to 49 years) had a RBC folate concentration below the clinical threshold indicating risk of anaemia (305nmol/L). The proportion of women of childbearing age who had a RBC folate concentration below the threshold indicating elevated risk of NTDs (748nmol/L) was 91%.

In Years 7 and 8 (combined), the proportion with RBC folate concentrations indicating increased risk of biochemical folate insufficiency, as defined by the estimated range within which the threshold lies (450 to 550nmol/L) was between 72% and 86% of girls aged 11 to 18 years, 60% and 74% of women of childbearing age, 46% and 71% of boys aged 11 to 18 years, 41% and 59% of adults aged 19 to 64 years, 31% and 49% of adults aged 65 years and over and 26% and 52% of children aged 4 to 10 years.

Table 8.6

4.2.2 Serum folate

The mean serum folate concentration in Years 7 and 8 (combined) is shown in table G. Serum folate concentration below the WHO clinical threshold indicating possible deficiency (13nmol/L) was found in 16% of children aged 4 to 10 years, 49% of boys aged 11 to 18 years, 73% of girls aged 11 to 18 years, 46% of men aged 19 to 64 years, 45% of women aged 19 to 64 years, 38% of men aged 65 years and over and 27% of women aged 65 years and over. This includes 9% of boys aged 11 to 18 years, 12% of girls aged 11 to 18 years, 8% of men aged 19 to 64 years and 11% of women aged 19 to 64 years who had a serum folate concentration below the WHO clinical threshold for folate deficiency (7nmol/L).

For women of childbearing age in Years 7 and 8 (combined), 57% had a serum folate concentration below the clinical threshold indicating possible folate deficiency (13nmol/L). This includes 15% who had a serum folate concentration below the WHO clinical threshold for folate deficiency (7nmol/L).

In Years 7 and 8, the proportion of the population with serum folate concentration indicating increased risk of biochemical folate insufficiency, as defined by the estimated range within which the threshold lies (10-15nmol/L), was between 38% and 74% of children aged 11 to 18 years, 36% and 63% of women of childbearing age, 29% and 54% of adults aged 19 to 64 years, 21% and 43% of adults aged 65 years and over and 5% and 28% of children aged 4 to 10 years.

Table 8.7

Table G Blood folate concentrations and percentages below clinical thresholds, for NDNS RP UK Years 7 and 8 (combined) (2014/15-2015/16)

	NDNS age groups (years)[a]							
	4-10	11-18		19-64		16-49	65+	
	sex-combined	Boys	Girls	Men	Women	Women	Men	Women
Red blood cell folate								
Mean concentration (nmol/L)[b]	537	456	377	531	485	430	523	640
% with concentration below 305nmol/L	7	15	28	3	11	16	14	10
% with concentration below NTD threshold 748nmol/L						91		
Serum folate								
Mean concentration (nmol/L)[b]	21.9	12.2	10.8	13.9	14.6	12.7	14.9	21.3
% with concentration below 7nmol/L	0	9	12	8	11	15	6	6
% with concentration below 13nmol/L[c]	16	49	73	46	45	57	38	27
Bases (unweighted)								
Red blood cell folate	*111*	*93*	*86*	*220*	*293*	*208*	*63*	*91*
Serum folate	*102*	*95*	*82*	*225*	*300*	*213*	*63*	*90*

[a] Due to small cell sizes for those aged 1.5 to 3 years and 4 to 10 years, descriptive statistics have not been presented for those aged 1.5 to 3 years and descriptive statistics have only been presented for the sex-combined 4 to 10 years age group.
[b] The means in this table are geometric means.
[c] The percentage with serum folate below 13nmol/L includes those with serum folate below 7nmol/L.

5 Urinary iodine

5.1 Introduction

Lack of dietary iodine can lead to goitre (enlargement of the thyroid), hypothyroidism and impairment of mental function including retardation in infants and children. On a worldwide basis, iodine deficiency is the single most important preventable cause of brain damage.[40] Indicators to assess and monitor the iodine status of a population have been defined by the World Health Organization (WHO 2007);[40] these state that in children and adults, median urinary iodine concentrations of between 100µg/L and 199µg/L and fewer than 20% of the population below 50µg/L define a population which has no iodine deficiency.[41]

The WHO guidelines suggest that the normal range for pregnant and lactating women should reflect their additional need and the risk that these needs may not be met if population levels are too low.[40] Therefore, this group should have a median urinary iodine concentration of between 150µg/L and 249µg/L to reflect a population with no deficiency.

A spot urine sample was introduced in Year 6 (2013/14) of the NDNS RP for measurement of urinary iodine concentration. The median and other descriptive statistics for urinary iodine concentration are presented for males, females and sexes combined for the following age groups: children aged 4 to10 years, children aged 11 to 18 years, adults aged 19 to 64 years, adults aged 65 years and over, and women of childbearing age (16 to 49 years). The following commentary is supported by accompanying Excel tables providing data for Years 7 and 8 (combined) (2014/15-2015/16) and for Year 6.

5.2 Urinary iodine concentrations

Table H provides a summary of urinary iodine concentrations in Years 7 and 8 (combined). Median urinary iodine concentration met the WHO criteria for adequate iodine status in all age/sex groups (ie median urinary iodine concentration within 100-199µg/L and fewer than 20% of samples below 50µg/L).

Urinary iodine concentration below 50µg/L was found in 9% of children aged 4 to 10 years, 12% of children aged 11 to 18 years, 14% of adults aged 19-64 and 8% of adults aged 65 years and over. These proportions were similar to those in Year 6 for all age groups.

In the NDNS RP, pregnant and lactating women are excluded from the survey. Instead, results are presented for women of childbearing age, thus providing more information which may help to characterise the iodine status of this group.[42]

The median urinary iodine for women of childbearing age (16 to 49 years) in Year 7 and 8 (combined) was 102µg/L with 17% of the population below 50µg/L. While these values met the WHO criterion for adequate intake for the general population, they do not meet the criterion for iodine sufficiency in pregnant and lactating women (ie median urinary iodine concentration within 150-249µg/L).

Table 9.1 and figure 9.2a-c

Table H Urinary iodine concentrations and percentages below thresholds, for NDNS RP UK Years 7 and 8 (combined) (2014/15-2015/16)

	NDNS age groups (years)[a]							
	4-10	11-18		19-64		16-49	65+	
	sex-combined	Boys	Girls	Men	Women	Women	Men	Women
Median concentration (µg/L)	166	125	116	105	105	102	133	135
% with concentration below 50µg/L	9	10	15	12	16	17	7	9
Bases (unweighted)	*372*	*221*	*203*	*376*	*522*	*426*	*109*	*152*

[a] Due to small cell sizes for those aged 1.5 to 3 years and 4 to 10 years, descriptive statistics have not been presented for those aged 1.5 to 3 years and descriptive statistics have only been presented for the sex-combined 4 to 10 years age group.

6 Response rates for Years 7 and 8 (combined) and notes on statistical comparisons

An overview of the purpose, documents, methodologies, procedures for data collection and quality control are provided in the NDNS RP supporting technical appendices. They include a consideration of the methodological issues and limitations of self-reported measures of food intake such as time between diet and nutritional status assessment and days of the week recorded in the food diary, as well as misreporting, which is a limitation of all methods of measuring food intake currently used in dietary surveys. These should be borne in mind while interpreting these findings.

6.1 Response rates

In Years 7 and 8 (combined) (2014/15-2015/16), a random sample of 9,072 addresses from 316 postcode sectors, drawn from the Postcode Address File, was issued between April 2014 and March 2016.[43] Where there were multiple households at an address, a single household was selected at random. For each household, either one adult (aged 19 years and over) and one child (aged 1.5 to 18 years), or one child only were randomly selected to take part.[44]

Selected individuals were asked to complete a diary of food and drink consumption over four consecutive days (with the start date randomly allocated) and an interview was conducted to collect background information on dietary habits, socio-demographic status, lifestyle and physical activity. Participants also had their height and weight measured and those aged four years and over were asked to provide a spot urine sample. Participants who agreed to a nurse visit were asked to provide a blood sample to assess biochemical indices of nutritional status. Physical measurements including blood pressure and waist and hip circumferences were also taken by the nurse.

Response rates achieved for key components of the NDNS RP in Years 7 and 8 (combined) are shown in table I.

Table I Response rates achieved for Years 7 and 8 (combined) (2014/15-2015/16)		
Individual response	**N**	**%**
Completion of food and drink diary (3 or 4 days)	2723 (1417 adults, 1306 children)	53%
Of those completing a food and drink diary:		
Spot urine sample obtained	1159 adults, 804 children	82% of adults, 62% of children
Blood sample obtained[a]	704 adults, 329 children	50% of adults, 25% of children

[a] All individuals visited by a nurse were asked if they were willing to provide a blood sample.

6.2 Statistical comparisons

The data were weighted to minimise any bias in the observed results, which may be due to differences in the probability of households and individuals being selected to take part; and to attempt to reduce non-response bias.[45]

Statistical comparisons were performed for Years 7 and 8 (combined) versus Years 1 and 2 (combined), for Years 5 and 6 (combined) versus Years 1 and 2 (combined), and for Years 3 and 4 (combined) versus Years 1 and 2 (combined). No other comparisons between paired years have been performed. Comparisons were only performed where the goodness-of-fit statistic R-squared was above 5% (see appendix U for more details). Due to the skewed nature of the data, data for "5 A Day" fruit and vegetable portions[13] have been transformed to the natural logarithmic scale before statistical analysis was performed. For the following foods, the number of consumers is low so data were dichotomised (split into two) using the median as the cut-off value before statistical analysis was performed using logistic regression:

- red and processed meat consumption (g/day)
- sugar-sweetened soft drinks consumption (g/day)

Achieving "5 A Day" fruit and vegetable portions data were also analysed using logistic regression.

References

[1] From 1 April 2013, responsibility for the NDNS contract transferred from the Department of Health in England to the Department of Health's Executive Agency, Public Health England (PHE).
[2] In 2016, following restructuring and refocusing of its research interests MRC Human Nutrition Research was renamed the MRC Elsie Widdowson Laboratory (MRC EWL). This took effect from 01 September 2016.
[3] Ashwell M, Barlow S, Gibson S, Harris C (2006) National Diet and Nutrition Surveys: the British experience. Public Health Nutrition 9(4) 523-530.
[4] https://www.gov.uk/government/publications/the-eatwell-guide (accessed 07/02/2018)
[5] Gregory JR, Collins DL, Davies PSW, Hughes JM, Clarke PC. National Diet and Nutrition Survey: children aged 1 ½ to 4 ½ years. Volume 1: Report of the diet and nutrition survey London: HMSO, 1995.
Hinds K, Gregory JR. National Diet and Nutrition Survey: children aged 1½ to 4½ years. Volume 2: Report of dental survey. London: HMSO, 1995.
[6] Gregory JR, Lowe S, Bates CJ, Prentice A, Jackson LV, Smithers G, Wenlock R, Farron M. National Diet and Nutrition Survey: young people aged 4 to 18 years. Volume 1: Report of the diet and nutrition survey. London: TSO, 2000.
Walker A, Gregory J, Bradnock G, Nunn J, & White D. National Diet and Nutrition Survey: young people aged 4 to 18 years. Volume 2: Report of the oral health survey. London: TSO, 2000.
[7] Henderson L, Gregory J, Swan G. National Diet and Nutrition Survey: adults aged 19 to 64 years. Volume 1: Types and quantities of food consumed. London: TSO, 2002.
Henderson L, Gregory J, Irving K, Swan G. National Diet and Nutrition Survey: adults aged 19 to 64 years. Volume 2: Energy, protein, carbohydrate, fat and alcohol intake. London: TSO, 2002.
Henderson L, Irving K, Gregory J, Bates CJ, Prentice A, Perks J, Swan G, Farron M. National Diet and Nutrition Survey: adults aged 19 to 64 years. Volume 3: Vitamin and mineral intake and urinary analytes. London: TSO, 2003.
Rustin D, Hoare J, Henderson L, Gregory J, Bates CJ, Prentice A, Birch M. National Diet and Nutrition Survey: adults aged 19 to 64 years. Volume 4: Nutritional status (anthropometry and blood analytes), blood pressure and physical activity. London: TSO, 2004.
Hoare J, Henderson L, Bates CJ, Prentice A, Birch M, Swan G, Farron M. National Diet and Nutrition Survey: adults aged 19 to 64 years. Volume 5: Summary report. London: TSO, 2004.
[8] Finch S, Doyle W, Lowe C, Bates CJ, Prentice A, Smithers G, Clarke PC. National Diet and Nutrition Survey: people aged 65 years and over. Volume 1: Report of the diet and nutrition survey. London: TSO, 1998.
Steele JG, Sheiham A, Marcenes W, Walls AWG. National Diet and Nutrition Survey: people aged 65 years and over. Volume 2: Report of the oral health survey. London: TSO, 1998.
[9] Additional recruitment was undertaken in Wales (Years 5 to 9) and in Northern Ireland (Years 6 to 10) in order to achieve representative data for each country and to enable comparisons to be made with UK results.
[10] The Wales boost was funded by the Food Standards Agency (FSA) in Wales which previously shared policy responsibility for diet and nutrition of the population in Wales. This policy area is now solely the responsibility of the Welsh Government.
[11] The Northern Ireland boost has been co-funded by three funding partners: the Department of Health, Social Services and Public Safety (DHSSPS); the Food Safety Promotion Board (safefood) and FSA in NI. FSA in NI has responsibility for monitoring the diet of the population in Northern Ireland.
[12] Separate reports for Wales and for Northern Ireland Years 5 to 9 (combined) will be published late 2018.
[13] Department of Health 5 A Day programme http://www.nhs.uk/Livewell/5ADAY/Pages/5ADAYhome.aspx (accessed 07/02/18).
[14] SACN. Carbohydrates and Health. London: TSO, 2015. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/445503/SACN_Carbohydrates_and_Health.pdf (accessed 07/02/18)
[15] Results for NMES and NSP are not presented in this report but will be included in the dataset on the UK data archive.
[16] Blood folate results have not previously been published for Years 5 and 6. Results for Years 1 to 4 were republished in November 2017. https://www.gov.uk/government/statistics/national-diet-and-nutrition-survey-supplementary-report-blood-folate (accessed 07/02/18)
[17] Swan G, Powell N, Knowles B, Bush M, Levy L. A definition of free sugars for the UK. Public Health Nutrition in press.

[18] Buss, D. H., Lewis, J. and Smithers, G. (1994), Non-milk extrinsic sugars. Journal of Human Nutrition and Dietetics, 7: 87. doi:10.1111/j.1365-277X.1994.tb00411.x
[19] Public Health England 2015 Composition of foods integrated dataset (CoFID) https://www.gov.uk/government/publications/composition-of-foods-integrated-dataset-cofid (accessed 07/02/18).
[20] Dietary surveys are reliant on self-reported measures of food intake. Misreporting of food consumption, generally underreporting, in self-reported dietary methods is a well-documented issue. This is an important consideration when interpreting the findings from this survey.
[21] The recommendation that free sugars provides no more than 5% of daily total energy intake applies to those aged 2 years and over.
[22] A comparison of the new free sugar values with the previous NMES values across paired years shows a consistent increase in mean intakes of around 1-2g, which will have only a minimal impact on the percentage contributions to total energy intake.
[23] SACN AOAC fibre recommendations: 30g/day for adults; 25g/day for older children aged 11-16 years; 20g/day for the 5-11 year age group; 15g/day for the 2-5 year age group
[24] A comparison of the new AOAC fibre values with the previous NSP values across paired years shows a consistent increase in mean intakes of around 30% higher than NSP.
[25] http://hub.careinspectorate.com/media/92260/cwt-eatingwellsupportingolderpeopledementia.pdf (accessed 07/02/18)
[26] Office for National Statistics: Population Estimates for UK, England and Wales, Scotland and Northern Ireland: mid-2016. https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland (Accessed 07/02/18).
[27] Results for food consumption include vegetables, fruit, meat and fish after disaggregation (ie including the contribution from composite dishes, both homemade dishes and manufactured products, containing these ingredients but excluding other components of these dishes).
[28] The Department of Health has advised that people who eat a lot of red and processed meat a day (more than 90g cooked weight) cut down to 70g. http://www.nhs.uk/Livewell/Goodfood/Pages/meat.aspx (Accessed 07/02/18)
[29] An NDNS RP substudy found that reported energy intake (EI) in adults aged 65 years and over was about 29% lower than total energy expenditure (TEE). The substudy was carried out in Years 1 and 3 comparing EI estimates from the four-day diary with TEE measurements using the doubly labelled water (DLW) technique. (see Appendix X for more detail).
[30] Scientific Advisory Committee on Nutrition. Dietary Reference Values for Energy: [Online]. Available https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/339317/SACN_Dietary_Reference_Values_for_Energy.pdf (2011) (Accessed 07/02/18).
[31] Report on Health and Social Subjects 41 *Dietary Reference Values (DRVs) for Food Energy and Nutrients for the UK*, Report of the Panel on DRVs of the Committee on Medical Aspects of Food Policy (COMA) 1991. The Stationery Office. London.
[32] The RNI for a vitamin or mineral is the amount of the nutrient that is sufficient for 97.5% of people in the group. If the average intake of the group is at the RNI, then the risk of deficiency in the group is judged to be very small. However, if the average intake is lower than the RNI then it is more likely that some of the group will have an intake below their requirement.
[33] The adequacy of vitamin or mineral intake can be expressed as the proportion of individuals with intakes below the LRNI. The LRNI for a vitamin or mineral is set at the level of intake considered likely to be sufficient to meet the needs of only 2.5% of the population. An intake below the LRNI is only considered a problem if sustained over a period of time. As diet is recorded for only four days in the NDNS RP, estimated intake values may not represent intakes over the longer term for micronutrients that are not widely distributed in foods such as vitamin A. It should also be noted that DRVs for some micronutrients such as magnesium, potassium, selenium and zinc are based on very limited data so caution should be used when assessing adequacy of intake using the LRNI.
[34] Scientific Advisory Committee on Vitamin D and Health: [Online]. Available https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/537616/SACN_Vitamin_D_and_Health_report.pdf (2016) (Accessed 07/02/18)
[35] Geometric means are calculated using log transformed data and then back-transformed onto the original scale.
[36] In the NDNS RP supplementary report for blood folate results Years 1-4 (republished November 2017), arithmetric means are presented not geometric so direct comparisons cannot be made with this report.
[37] WHO. Serum and red blood cell folate concentrations for assessing folate in populations. Vitamins and Mineral Nutrition Information System. 2015; 01.1-7.

[38] Beverley Bates, Polly Page, Lorna Cox, Sonja Nicholson, Caireen Roberts, David Collins et al. National Diet and Nutrition Survey Rolling Programme Supplementary report: blood folate results for the UK as a whole, Scotland,
Northern Ireland (Years 1 to 4 combined) and Wales (Years 2 to 5 combined). Revised November 2017: https://www.gov.uk/government/statistics/national-diet-and-nutrition-survey-supplementary-report-blood-folate (Accessed 07/02/18)
[39] Tinker SC, Hamner H, Qi YP, Crider KS. U.S. Women of Childbearing Age Who Are at Possible Increased Risk of a Neural Tube Defect-Affected Pregnancy Due to Suboptimal Red Blood Cell Folate Concentrations, National Health and Nutrition Examination Survey, 2007–2010. National Health and Nutrition Examination Survey 2007 to 2012. Birth Defects Research (Part A) 103:517–526, 2015
[40] World Health Organization (WHO). Tables 4 and 5 in Assessment of iodine deficiency disorders and monitoring their elimination: http://whqlibdoc.who.int/publications/2007/9789241595827_eng.pdf (Accessed 07/02/18)
[41] Spot samples only allow for population level iodine concentration rather than individual iodine concentrations to be obtained.
[42] Sampling of pregnant women can be difficult because the number of pregnant women present in household-based surveys may be small. Assessing the median value in women of reproductive age or among adolescent girls is more feasible in a population-based survey, and may be helpful in interpreting the median population value.
[43] This includes additional recruitment in Wales and Northern Ireland to boost to 200 participants per year in order to achieve country-specific, representative dietary health data. In previous years, country-specific boosts were as follows: Wales (Year 2 to 6); Northern Ireland (Years 1 to 6) and Scotland (Years 1 to 4).
[44] In some core sample households (where up to one adult and one child could be selected), it was possible to end up with an adult participant only, either because the selected child was not able/did not wish to take part or because there was no resident child eligible for selection.
[45] Non-response bias occurs if those who respond to the survey (or elements of the survey) differ from those who do not respond. Data were weighted to reduce such bias.