

## Key Findings: NDNS Report Years 9 to 11 (2016/17 to 2018/19) and time trend analysis for Years 1 to 11 (2008/09 to 2018/19).



The National Diet and Nutrition Survey (NDNS) Report of Years 9 to 11 (2016 to 2017 and 2018 to 2019) of the Rolling Programme has been published by Public Health England. The report presents key findings for foods, nutrients and blood analytes, selected on the basis of their importance to public health and government priorities for policy and monitoring.

The [full NDNS report is available here](#). This summary includes the following:

### Foods and drinks

- [Sugar sweetened beverages](#)
- [Red and processed meat](#)
- [Fruit and vegetables](#)
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### Macronutrient intakes

- [Free sugars](#)
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### Micronutrient intakes and status

- [Vitamin D](#)
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The authors concluded that the analyses presented in this report do not identify any new nutritional problems in the general population. The UK population overall continues to consume too much sugar and saturated fat and not enough fruit and vegetables or fibre. Consumption of sugar-sweetened soft drinks has fallen in most age groups. There is evidence of low blood levels for folate and vitamin D in most age groups, and for folate there has been a fall in blood levels over time. Low iron intakes, and to a lesser extent low haemoglobin and iron stores, were seen in girls aged 11-18 years and women aged 19-64 years.

## Foods and drinks

### Sugar-sweetened soft drinks

Sugar sweetened soft drinks (defined as soft drinks, not low calorie; concentrated, carbonated and still) are a major contributor to free sugars intakes; especially in children. In 2015 SACN recommended that the consumption of sugar-sweetened beverages (that is soft drinks) should be minimised by both children and adults.

#### *Years 9 to 11*

- In children, the highest mean consumption of sugar-sweetened soft drinks was seen in those aged 11-18 years (with the lowest seen in those aged 1.5-3 years).

Age (years)	Mean intake of sugar-sweetened drinks (g/day)
1.5-3	19
4-10	52
11-18	142
19-64	106
65 and over	34

### ***Time trends***

- Mean consumption of sugar-sweetened drinks was lower in Years 9 to 11 compared with Years 7 & 8 for all age groups, but was not significantly different in adolescent boys and older adults.
- Over the 11 years from 2008 (Years 2008/09 to 2018/19), the proportion of children consuming sugar-sweetened soft drinks fell by 32 percentage points for those aged 1.5-3 years, 44 percentage points for 4-10 year-olds, 25 percentage points for 11-18 year-olds and by 20 percentage points for adults aged 19-64 years.

## **Red and processed meat**

The Department of Health advises that individuals who currently eat more than 90g (cooked weight) of red and processed meat a day should reduce their intake to no more than 70g, as eating a lot of red and processed meat probably increases the risk of bowel (colorectal) cancer.

### ***Years 9 to 11***

- Mean consumption in all age or sex groups met the recommendation of no more than 70g per day.
- However, there is considerable variation in consumption within age groups in the UK population, such as in men aged 19-64 years, where intakes vary from 0 – 208g when comparing the 2.5<sup>th</sup> to the 97.5<sup>th</sup> percentile.

### ***Time trends***

- Median consumption of red and processed meat was significantly lower in Years 9 to 11 (2016 to 2019) than in Years 7 & 8 (2014 to 2016) for men aged 19 to 64 years and adults aged 65 years and over.
- Over the 11 years since 2008, there were reductions in mean consumption in all age groups of 13 g/day, 23 g/day and 19 g/day for those aged 11-18 years, 19-64 years and 65 years and over, respectively.

## **Fruit and vegetables**

Government recommends consuming at least 5 portions a day (one portion is equal to 80g, or 30g of dried fruit) of a variety of fruit and vegetables as part of healthy, balanced diet. The 5 A DAY campaign is based on advice from the World Health Organization (WHO), which recommends eating a minimum of 400g of fruit and vegetables a day to lower the risk of serious health problems, such as heart disease, stroke and some types of cancer.

### ***Years 9 to 11***

- The average number of portions consumed was 4.3 per day for adults, 4.5 per day for older adults (aged 65-74 years) and 3.9 per day for older adults aged 75 years and over. Intake in 11 to 18 year-olds remained low at 2.9 portions per day.

- Only 33% of adults, 40% of older adults aged 65-74 years, 27% of older adults aged 75 years and over, and 12% of 11 to 18 year-olds met the 5 A DAY recommendation.

### *Time trends*

- Mean fruit and vegetable consumption in 2016 to 2019 was unchanged compared with 2014 to 2016 in all age groups except for the 11-18 years age group, for whom there was an increase of 0.2 portions per day. The proportion of this age group meeting the 5 A DAY recommendation also increased from 8% to 12%.
- Over years 1 to 11 there was a 7 percentage point increase in the proportion of women aged 19-64 years meeting the 5 A DAY recommendation, but no change for other age groups.

## **Oily fish**

Government advice is to consume at least two portions (140g) of fish per week, one of which should be an oily fish (e.g. salmon, herring, sardines, mackerel). Oily fish contains long-chain omega 3 fatty acids (EPA and DHA) which can help to prevent heart disease.

### *Years 9 to 11*

- Mean consumption of oily fish was equivalent to 56g per week in adults aged 19-64 years and 86g per week in adults aged 65 years and over, well below the recommended one portion (140g) per week in all age groups.
- Mean consumption in children was less than 20g per week.
- Oily fish was not included in the comparison with Years 7 & 8 or Years 1 to 11 time trend analyses.

## **Macronutrient intakes**

### **Free sugars intake**

High levels of sugar consumption are associated with greater risk of tooth decay and the higher the proportion of sugar in the diet, the greater the risk of high energy intake, which can lead to weight gain. The recommendation is that free sugars should provide **no more than 5% of total energy** for those aged 2 years and over.

### *Years 9 to 11*

- Mean intakes of free sugars for Years 9 to 11 (2016 to 2019) exceeded the government recommendation for all age groups.
- Intakes were highest for girls aged 11-18 years (12.5% energy) and boys aged 4-10 years (12.4% energy), while children aged 1.5-3 years had the lowest mean intake (9.7%).

### *Time trends*

- Mean intakes of free sugars were lower in Years 9 to 11 compared with Years 7 & 8 and this was statistically significant for all children by age/sex groups, but not adults aged 19-64 years and men aged 65 years and over.
- Over Years 1 to 11 of the rolling programme (since 2008) there was a significant reduction in free sugars intake for adults and children (see table below), although this was larger for children aged 1.5-3 years (3.8 percentage points), 4-10 years (3.9 percentage points) and 11-18 years (percentage points) than in adults.

Free sugars intake (% of total energy) in all age groups for all paired years of the NDNS Rolling Programme	Years 1&2 (2008/09 - 2009/10)	Years 3&4 (2010/11 - 2011/12)	Years 5&6 (2012/13 - 2013/14)	Years 7&8 (2014/15- 2015/16)	Years 9-11 (2016/17- 2018/19)
<b>Children 1.5-3 years</b>	12.1	13.0	12.8	11.3	9.7*
<b>Children 4-10 years</b>	14.7	15.5	14.0	13.5	12.1*
<i>Boys 4-10 years</i>	14.8	15.7	14.4	13.6	12.4*
<i>Girls 4-10 years</i>	14.6	15.2	13.5	13.4	11.8*
<b>Children 11-18 years</b>	15.9	15.8	15.8	14.1	12.3*
<i>Boys 11-18 years</i>	16.2	16.3	16.0	13.9	12.1*
<i>Girls 11-18 years</i>	15.6	15.3	15.5	14.4	12.5*
<b>Adults 19-64 years</b>	11.8	11.7	12.1	11.1	9.9*
<i>Men 19-64 years</i>	12.0	12.3	12.5	11.1	9.9*
<i>Women 19-64 years</i>	11.6	11.2	11.6	11.2	9.9*
<b>Adults 65 years and over</b>	10.9	11.4	10.8	11.2	9.4*
<i>Men 65 years and over</i>	10.6	11.6	11.6	12.1	9.7*
<i>Women 65 years and over</i>	10.1	11.3	9.5	10.4	9.2
<b>Adults 65-74 years</b>	9.9	11.2	10.5	11.0	9.0*
<i>Men 65-74 years</i>	9.7	11.0	11.6	11.8	9.0*
<i>Women 65-74 years</i>	10.1	11.3	9.5	10.4	9.0
<b>Adults 75 years and over</b>	12.2	11.8	11.3	11.3	10.2
<i>Men 75 years and over</i>	11.8	12.3	[11.5]	12.5	10.9
<i>Women 75 years and over</i>	12.4	11.2	11.2	10.4	9.6

\*Statistically significant difference vs. years 7&8; Data and bases for a variable with a cell size between 30-49 are presented in square brackets.

## Saturated fatty acids intake

The government recommendation that the population average contribution of saturated fat should be reduced to **no more than 10% of total dietary energy** was confirmed by the Scientific Advisory Committee on Nutrition (SACN) in 2019 in their report [Saturated fats and health](#).

### Years 9 to 11

- Mean saturated fatty acids intake exceeded the government recommendation for all age groups to which the recommendation applies, including children aged 4-10 years (13.1%) and 11-18 years (12.6%), and adults aged 19-64 years (12.3%) and 65 years and over (13.3%).

### **Time trends**

- In men aged 19 -64 years, mean saturated fatty acids intake as a percentage of total energy increased significantly by 0.5 percentage points between Years 7 & 8 and Years 9 to 11, and the proportion of men in this age group meeting the recommendation fell significantly by 7 percentage points.
- Over Years 1 to 11, changes in saturated fatty acids intake as a percentage of total energy were close to zero in all age/sex groups.

### **Fibre**

The government recommendation is that the population average intake of fibre for adults should be 30g per day (with proportionally lower recommendations for children from the age of 2 years) and is based on SACN's 2015 report [Carbohydrates and health](#). There is strong evidence to indicate that diets high in fibre are associated with a lower risk of cardiovascular diseases (e.g. heart attack or stroke), type 2 diabetes and bowel cancer.

#### ***Years 9 to 11***

- For all age groups, mean intake of fibre was below the government recommendation (30 g/day), as shown in the table below.
- The percentage meeting the recommendation was lowest in adults aged over 75 years (3%) and highest in children aged 4-10 years (14%).

#### ***Time trends***

- No significant changes were seen between Years 7 & 8 and years 9 to 11, except for a 7 percentage point increase in boys aged 4-10 years (from 11% to 18%).
- Over the 11-year period of the rolling programme, no consistent pattern in changes to fibre intake was reported, except a small significant decrease in intakes for girls aged 4-10 years (0.1 g/day per year), and a significant average increase in fibre intake of 0.2 g/day per year for adults aged 19-64 years.

AOAC fibre intake (g/day) in all age groups for all paired years of the NDNS Rolling Programme	Years 1&2 (2008/09 - 2009/10)	Years 3&4 (2010/11 - 2011/12)	Years 5&6 (2012/13 - 2013/14)	Years 7&8 (2014/15- 2015/16)	Years 9-11 (2016/17- 2018/19)
<b>Children 1.5-3 years</b>	10.6	10.7	10.3	10.3	10.4
<b>Children 4-10 years</b>	14.9	14.7	14.1	14.0	14.3
<i>Boys 4-10 years</i>	15.4	15.0	15.1	14.5	15.1
<i>Girls 4-10 years</i>	14.5	14.4	13.1	13.5	13.5
<b>Children 11-18 years</b>	16.1	15.5	15.9	15.3	16.0
<i>Boys 11-18 years</i>	17.3	17.0	16.7	16.5	16.5
<i>Girls 11-18 years</i>	14.8	14.0	15.0	14.1	15.4*
<b>Adults 19-64 years</b>	18.5	18.0	18.4	19.0	19.7
<i>Men 19-64 years</i>	19.8	19.4	19.7	20.7	21.2
<i>Women 19-64 years</i>	17.3	16.7	17.0	17.4	18.1
<b>Adults 65 years and over</b>	18.1	18.8	18.0	17.5	18.7*
<i>Men 65 years and over</i>	19.9	19.8	19.0	19.0	20.1
<i>Women 65 years and over</i>	16.7	18.1	17.1	16.4	17.6
<b>Adults 65-74 years</b>	19.1	19.7	18.7	18.4	18.7
<i>Men 65-74 years</i>	22.1	21.2	19.8	19.5	21.0
<i>Women 65-74 years</i>	16.7	18.7	17.6	17.4	18.5
<b>Adults 75 years and over</b>	16.7	17.6	16.8	16.5	17.3
<i>Men 75 years and over</i>	16.5	18.1	[17.5]	18.3	18.6
<i>Women 75 years and over</i>	16.8	17.0	16.4	15.1	16.3

\*Statistically significant difference vs. years 7&8; Data and bases for a variable with a cell size between 30-49 are presented in square brackets.

## Micronutrient intakes and status

### Vitamin D

In 2016, the SACN report '[vitamin D and health](#)' set a Reference Nutrient Intake (RNI) of 10 µg/day for adults and children aged 5 years and over, and a safe 'intake' of 8.5-10 µg/day for infants aged 0-12 months and 10 µg/day for young children aged 1-4 years. These were developed to ensure that the majority of the UK population has enough vitamin D to maintain levels of 25-hydroxyvitamin D (25-OHD), the most widely used marker of status, above 25 nmol/L to protect musculoskeletal health.

### Years 9 to 11

- **Intakes:** Mean vitamin D intakes from all sources (including supplements) were below the recommendation for all age groups, except for women aged 65-74 years.
- **Status:** In Years 9 to 11, the proportion of older children and adults with low vitamin D status (% below 25 nmol/L) was 19% in children aged 11-18 years, 16% in adults aged 19-64 years and 13% in adults aged 65 years and over.

Vitamin D intake and status in years 9 to 11	Vitamin D intake from all sources (including supplements; µg/day)	% vitamin D supplement takers (%)	Mean 25-OHD concentration (nmol/L)	% below 25 nmol/L
<b>Children 1.5-3 years</b>	4.0	25	N/A	N/A
<b>Children 4-10 years</b>	3.7	21	60.0*	2
<i>Boys 4-10 years</i>	3.7	24	63.2	1
<i>Girls 4-10 years</i>	3.6	19	56.6	3
<b>Children 11-18 years</b>	2.9	9	43.6	19
<i>Boys 11-18 years</i>	3.0	8	45.2	21
<i>Girls 11-18 years</i>	2.9	11	42.1	17
<b>Adults 19-64 years</b>	5.4	17	48.4	16
<i>Men 19-64 years</i>	5.2	13	45.3	18
<i>Women 19-64 years</i>	5.5	20	51.3	15
<b>Adults 65 years and over</b>	7.9	32	55.6	13
<i>Men 65 years and over</i>	7.3	29	53.3	13
<i>Women 65 years and over</i>	8.3	35	57.2	13
<b>Adults 65-74 years</b>	9.1	34	N/A	N/A
<i>Men 65-74 years</i>	7.9	28	N/A	N/A
<i>Women 65-74 years</i>	10.1	40	N/A	N/A
<b>Adults 75 years and over</b>	6.0	28	N/A	N/A
<i>Men 75 years and over</i>	6.3	30	N/A	N/A
<i>Women 75 years and over</i>	5.7	27	N/A	N/A

\*Statistically significant difference vs. years 7&8; N/A, no value reported for age/sex group.

### Time trends in vitamin D status

- There was a significant increase (6.2 nmol/L) in children aged 4-10 years, but no significant changes in mean 25-OHD status in other age/sex groups between Years 9 to 11 and Years 7 & 8.
- Over the 11-year period of the programme, there was little change in mean 25-OHD concentration, except a significant increase for children aged 4-10 years (1 nmol/L per year) and women aged 65 years and over (2 nmol/L per year).

## Iodine

Iodine is required for the production of thyroid hormones, which in turn are required for normal fetal brain and neurological development. World Health Organization (WHO) indicators to define a population which has no iodine deficiency are a median urinary iodine concentration of between 100 µg/L and 199 µg/L and fewer than 20% of the population below 50 µg/L.

### Years 9 to 11

- **Intakes:** The proportion of people with iodine intakes below the Lower Reference Nutrient Intake (LRNI) – the amount considered sufficient for only a small percentage of the population with the lowest

requirements (2.5%) – was 4%, 7% and 24%, for children aged 1.5-3 years, 4-10 years and 11-18 years, and 10% and 6% for adults aged 19-64 years and 65 years and over, respectively.

- **Status:** For women of childbearing age, median urinary iodine concentration was below the WHO criteria for adequate iodine status (see above), but was met in all other age/sex groups. Median urinary iodine concentration for women of childbearing age was 98 µg/L and 21% of women had a spot urine sample concentration below 50 µg/L.

#### ***Time trends in iodine status***

- There were no statistically significant differences in median urinary iodine concentrations between Years 7 & 8 and Years 9 to 11 for any age group.
- Mean urinary iodine concentration was 9% lower in women of childbearing age in Years 9 to 11 compared to Years 7 & 8, but this difference was not statistically significant.
- Mean urinary iodine concentrations did not change significantly in the Years 1 to 11 time trend analysis for any age/sex group.

## **Iron**

Iron is important in making red blood cells, which carry oxygen around the body. A lack of iron can lead to iron deficiency anaemia. WHO sets thresholds both for haemoglobin and plasma ferritin to define iron deficiency and anaemia.

#### ***Years 9 to 11***

- **Intakes:** Mean intakes (percentage below the LRNI) for iron were 5.8 mg/day (11%), 7.9 mg/day (2%) and 9.1 mg/day (30%) for children aged 1.5-3 years, 4-10 years and 11-18 years, and 10.5 mg/day (14%) and 9.7 mg/day (3%) for adults aged 19-64 years and 65 years and over, respectively.
- **Status:** The proportion with haemoglobin and ferritin concentrations below the WHO threshold for iron deficiency and anaemia were 9% for girls aged 11-18 years and 5% for women aged 19-64 years.

#### ***Time trends***

- **Intakes:** There were no statistically significant differences in mean iron intakes between Years 7 & 8 and Years 9 to 11 for any age/sex group. Over the 11 Years of the rolling programme, the percentage with iron intakes below the LRNI increased by 7, 2 and 6 percentage points for children aged 1.5-3 years, 4-10 years and 11-18 years, and by 3 percentage points for adults aged 19-64 years and 65 years and over, respectively.

## **Folate**

Folate helps the body form healthy red blood cells and reduces the risk of birth defects called neural tube defects, such as spina bifida, in unborn babies. Serum and red blood cell (RBC) folate concentrations are used for assessing folate status in populations.

#### ***Years 9 to 11***

- **Intakes:** The percentage with mean folate intakes below the LRNI was 0%, 1% and 9% for children aged 1.5-3 years, 4-10 years and 11-18 years, and 4% and 8% for adults aged 19-64 years and women of childbearing age (aged 16-49 years), respectively.
- In women of childbearing age, 89% had an RBC folate concentration less than the threshold indicating increased risk of neural tube defects (748 nmol/L).
- For serum folate, more than half of children aged 11-18 years (53%), adults aged 19-64 years (52%) and women of childbearing age (16-49 years; 52%), and a third of adults aged 65 years and over



(34%), had serum folate concentrations below the threshold indicating possible deficiency (13 nmol/L).

- 13% of women of childbearing (16 to 49 years) were below the lower serum folate threshold for clinical deficiency (7 nmol/L).

#### Time trends

- **Intakes:** There were no significant differences in mean folate intakes between Years 9 to 11 and Years 7 & 8 for any age/sex group.
- **Status:** There was a statistically significant 16% decrease in mean RBC folate concentration in women aged 65 years and over between Years 7 & 8 and Years 9 to 11, although changes for other age/sex groups were not significant. Although mean serum folate concentration was 11% higher for women of childbearing age for Years 9 to 11, compared to Years 7 & 8, this difference was not significant.
- Over Years 1 to 11, RBC folate concentration significantly decreased by 2 to 3% per year; equivalent to between a 22 to 31% decrease in RBC folate concentration since 2008.
- Mean serum folate also significantly decreased by 2 to 4% per year in all age/sex groups, except for children aged 1.5-3 years and men and women (separately) aged 65 years and over.

#### Other micronutrient intakes

Proportion of males and females of different age groups in the UK with intakes of micronutrients (food sources only) below the lower reference nutrient intake (LRNI)\*

Nutrient	Age groups										
	1.5-3 y	4-10 y		11-18 y		19 to 64 y		65-74 y		75 y+	
	All	Boys	Girls	Boys	Girls	Men	Women	Men	Women	Men	Women
Vitamin A	9	9	13	18	18	12	8	14	6	7	6
Riboflavin	0	1	2	13	22	4	13	4	10	8	11
Calcium	1	1	1	14	16	4	9	5	9	5	4
Magnesium	11	1	2	11	49	2	25	0	6	4	4
Potassium	0	0	1	22	37	10	24	4	20	16	21
Selenium	0	1	2	24	41	26	46	32	56	63	52
Zinc	8	8	15	20	16	6	7	8	4	10	4

\*The LRNI is the amount of a nutrient that is enough for only a small number of people in the population who have low requirements (2.5%), i.e. the majority need more. Y, age in years.

*Some dietary reference values are based on limited evidence, and this may mean that population estimates of inadequacy may be inaccurate. The health impact of low intakes for some micronutrients remains uncertain (e.g. riboflavin, magnesium, selenium).*