Dietary Intake in Scotland's CHildren (DISH): An assessment of diets in children and young people aged 2 to 15 years living in Scotland, 2024

Lindsay Jaacks, Geraldine McNeill, Ricki Runions and Cristina Stewart
The University of Edinburgh

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Abbreviations

CHI	Community Health Index
CI	Confidence interval
CURL	Community Health Index- Unique property reference number Residential Linkage
DISH	Dietary Intake in Scotland's CHildren
EAR	Estimated average requirement
eDRIS	Electronic Data Research and Innovation Service
FSS	Food Standards Scotland
HBSC	Health Behaviour in School-aged Children
HFSS	High in fat, sugar or salt
LRNI	Lower reference nutrient intake
MOI	Multiple occupancy indicator
NDB	UK Nutrient Databank
NDNS	National Diet and Nutrition Survey
PAF	Postcode Address File
PSU	Primary sampling unit
RNI	Reference nutrient intake
SACN	Scientific Advisory Committee on Nutrition
SHeS	Scottish Health Survey
SIMD	Scottish Index of Multiple Deprivation
UPRN	Unique property reference number

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Executive Summary

Background to survey

Poor diet is a leading contributor to poor health outcomes in Scotland. A Scotland where everyone eats well is a key public health priority. To achieve this vision, several policies have been adopted in recent years. These include:

- the Good Food Nation (Scotland) Act 2022,
- the Eating Out, Eating Well initiative,
- the Nutritional Requirements for Food and Drink in Schools (Scotland) Regulations 2020,
- the 2018 Soft Drinks Industry Levy and
- the forthcoming advertising restrictions on TV and online for products high in fat, sugar or salt (HFSS).

Despite these efforts, the limited information collected as part of the Scottish Health Survey suggests that poor diets in children and young people continue to be a significant public health challenge. Comprehensive information on the diet of Scottish children is scant, with the only comprehensive surveys designed to investigate this topic being carried out in 2006 and 2010. To fill this gap, a cross-sectional representative survey of children and young people aged 2 to 15 years living in Scotland was conducted in 2024. This survey is called Dietary Intake in Scotland's CHildren (DISH).

Survey methodology

Diet data were collected in DISH using an online platform called Intake24. Up to four 24-hour dietary recalls were collected from each child. Diets were reported by parents/guardians for children in pre-school or primary school. Children in secondary school had the opportunity to report their own diets. A majority (61%) of secondary school children completed the survey themselves, including additional questions on purchasing food and drink off school grounds during their lunch break, using food delivery apps and consumption of energy drinks. Parents/guardians also answered questions on food insecurity. Frequency of oily fish consumption was assessed using a survey question instead of Intake24. The final sample was 1,700 children and young people. Most (84%) participants completed two or more recalls; 32% completed four recalls.

Key findings

Adherence to the Scottish Dietary Goals

Most children and young people achieved the Scottish Dietary Goals for total fat, trans fat and total carbohydrate (see **Executive Summary Table 1**). However, overall and across all demographic groups, diets were too energy dense. 15% of children and young people met the energy density goal. Young people aged 11 to 15 years had significantly more energy-dense

diets than younger children: 181 kcal/100g versus 146 kcal/100g in children aged 2 to 4 years, both exceeding the goal of ≤125 kcal/100g. Intake of saturated fat was also higher than recommended, overall and across all demographic groups. 13% of children and young people met the saturated fat goal.

Intake of free sugars was 11% of energy overall, twice the recommended goal of ≤5%. On the other hand, fibre intake was too low. Overall, 8% of children and young people met the free sugars goal and 16% met the fibre goal. Consistent with observations for energy density, young people aged 11 to 15 years had significantly higher free sugars intake (12% of energy versus 9% of energy in children aged 2 to 4 years) and lower fibre intake relative to the age-specific recommendation (7% met the age-specific recommendation versus 32% of children aged 2 to 4 years).

In DISH, salt intake values do not fully take account of salt added during cooking and exclude salt added at the table by participants. The results for salt intake should therefore be interpreted with these caveats in mind. In contrast to other goals, the youngest children (those aged 2 to 4 years) had higher mean salt intake than recommended (3.3 g/day versus <2 g/day), whereas older children and young people had mean intakes below recommended levels (4.2 g/day versus <5 g/day for 5- to 10-year-olds and 4.6 g/day versus <6 g/day for 11- to 15-year-olds).

The current Scottish Dietary Goals do not specify different portion sizes for children for fruit and vegetables or red and red processed meat. We therefore reported mean intake of these food groups and not the proportion meeting the goals. On average, children of all ages consumed less than the fruit and vegetable goal for adults of ≥400 g/day, on average, consuming 272 g/day. In contrast, on average, children of all ages met the red and red processed meat goal for adults of ≤70 g/day, consuming, on average, 41 g/day.

Children and young people living in the least deprived areas were more than twice as likely to meet the fibre goal than those living in the most deprived areas (25% versus 11%, mean intake 17.0 g/day versus 14.8 g/day). Likewise, those living in the least deprived areas had significantly higher fruit and vegetable consumption compared to those living in the most deprived areas (305 g/day versus 229 g/day).

Finally, with regard to oily fish, less than one-fifth of children and young people of all ages consumed this food group at least once per week.

Executive Summary Table 1. Weighted mean intakes relative to the Scottish Dietary Goals in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

	Goal	**Met Goal Overall**	**Overall** (Mean)	**2-4y** (Mean)	**5-10y** (Mean)	**11-15y** (Mean)
Energy	≤125 kcal/100g	X	166	146	163	181
Total fat	≤35% of energy	✓	34%	33%	34%	34%
Saturated fat	≤10% of energy	X	13%	13%	13%	13%
Trans fat	<1% of energy	✓	0.5%	0.5%	0.5%	0.5%
Free sugars	≤5% of energy	X	11%	9%	10%	12%
Total carbohydrate	45-55% of energy	✓	51%	52%	51%	51%
Fibre	≥15 g/day for 2-4y ≥20 g/day for 5-10y ≥25 g/day for 11-15y	X	15.7	13.8	15.9	16.5
Salt[1]	<2 g/day for 2-3y <3 g/day for 4-6y <5 g/day for 7-10y <6 g/day for 11-15y	X	4.2	3.3	4.2	4.6
Fruit and vegetables[2]	≥400 g/day in adults	X	272	279	274	265
Red and red processed meat	≤70 g/day in adults	✓	41	28	40	48
Oily fish[3]	A portion at least once per week	X	16%	17%	17%	15%

[1] Values do not fully take account of salt added during cooking and exclude salt added at the table by participants.
[2] Allows for up to 40 g beans and 75 g fruit juice or smoothie in children aged 2 to 10 years and up to 80 g beans and 150 g fruit juice or smoothie in young people aged 11 to 15 years.
[3] Values are from a food frequency question and reflect the percentage reporting consuming oily fish at least once per week.

Nutrient Intake

- On average, overall, intake of protein and micro-nutrients was at or above the Reference Nutrient Intake (RNI) except for zinc, which was below the RNI (see **Executive Summary Table 2**).
- However, in females 11 to 15 years old, vitamin A, folate, iron, calcium, magnesium, potassium, iodine and selenium intake were, on average, below the RNI.
- Likewise, in males 11 to 15 years old, vitamin A, iron, calcium, magnesium, potassium and selenium intake were, on average, below the RNI.

Executive Summary Table 2. Summary of weighted mean nutrient intake relative to the age- and sex-specific RNI in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

Nutrient	Overall	Females			Males		
		2-4y	5-10y	11-15y	2-4y	5-10y	11-15y
Protein	>RNI	>RNI	>RNI	>RNI	>RNI	>RNI	>RNI
Vitamin A	>RNI	>RNI	>RNI	Below	>RNI	>RNI	Below
Riboflavin	>RNI	>RNI	>RNI	>RNI	>RNI	>RNI	>RNI
Folate	>RNI	>RNI	>RNI	Below	>RNI	>RNI	>RNI
Vitamin B_{12}	>RNI	>RNI	>RNI	>RNI	>RNI	>RNI	>RNI
Vitamin C	>RNI	>RNI	>RNI	>RNI	>RNI	>RNI	>RNI
Iron	>RNI	>RNI	>RNI	Below	>RNI	>RNI	Below
Calcium	>RNI	>RNI	>RNI	Below	>RNI	>RNI	Below
Magnesium	>RNI	>RNI	>RNI	Below	>RNI	>RNI	Below
Potassium	>RNI	>RNI	>RNI	Below	>RNI	>RNI	Below
Iodine	>RNI	>RNI	>RNI	Below	>RNI	>RNI	>RNI
Selenium	>RNI	>RNI	>RNI	Below	>RNI	>RNI	Below
Zinc	Below	Below	Below	Below	Below	>RNI	Below

- The percentage of participants below the Lower Reference Nutrient Intake (LRNI) was less than 10% for all nutrients in 2- to 4-year-olds and 5- to 10-year-olds (see **Executive Summary Table 3**). However, this percentage was at or above 10% in 11- to 15-year-olds for vitamin A, riboflavin, iron, calcium, magnesium, potassium, iodine, selenium and zinc.

Executive Summary Table 3. Weighted percentage of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024, with a nutrient intake below the LRNI (unweighted sample size 1,700).

Nutrient	Overall	2-4y	5-10y	11-15y
Vitamin A	10%	5%	9%	13%
Riboflavin	6%	0%	1%	16%
Folate	3%	0%	1%	7%
Vitamin B_{12}	1%	0%	0%	2%
Vitamin C	0%	0%	0%	1%
Iron	11%	1%	2%	28%
Calcium	4%	0%	1%	10%
Magnesium	19%	0%	2%	32%
Potassium	7%	0%	1%	17%
Iodine	8%	4%	3%	15%
Selenium	9%	0%	0%	24%
Zinc	10%	4%	6%	17%

Contribution of Food Groups to Nutrient Intake

- The most commonly consumed food groups across up to 4 days of recalls were:
    - Fruit (consumed by 80%),
    - Pasta, rice, pizza and other miscellaneous cereals (consumed by 77%),
    - White bread (consumed by 71%),
    - Biscuits (consumed by 68%),
    - Vegetables (not raw) (consumed by 65%) and
    - Crisps and savoury snacks (consumed by 65%).
- Biscuits, Buns, cakes, pastries and fruit pies, Yogurt, fromage frais and other dairy desserts, Chocolate confectionery, Fruit juice, and Soft drinks were major sources of free sugars.
- Pasta, rice, pizza and other miscellaneous cereals, Sandwiches, Fruit, vegetables, Breakfast cereals and Bread were major sources of fibre.
- Milk and milk products and Meat and meat products were major sources of saturated fat.
- Pasta, rice, pizza and other miscellaneous cereals, Sandwiches, Meat and meat products, Crisps and savoury snacks, and Bread were major sources of sodium.
- Bread and Breakfast cereals were major sources of iron.
- Animal-source foods such as Meat and meat products, Fish and fish dishes, and Milk and milk products were major sources of selenium.

Discretionary and Additional Food and Drink Consumption

- The Scottish Government's consultation on proposed regulations to restrict the promotion of HFSS products includes detail on the foods that would be subject to restriction. The list of foods includes 'discretionary' foods and drinks: confectionery, sweet biscuits, crisps and savoury snacks, cakes, sweet pastries, sugary drinks, puddings, ice cream and dairy desserts. The consultation also proposes 'additional' categories captured by existing promotional restrictions in England: breakfast cereals, sweetened yogurt and fromage frais, pizza, ready meals, and roast potatoes, chips and similar potato products. We evaluated consumption of these food groups in DISH.
- Based on up to 4 days of recalls, Breakfast cereals were consumed by a majority of children and young people (70%). Crisps and savoury snacks were consumed by 65%, Cakes, pastries and puddings by 61%, and Sweet biscuits by 58% (see **Executive Summary Table 4**).
- Discretionary foods contributed 21% of energy intake and additional foods contributed 16% of energy intake. Cakes, pastries and puddings and Crisps and savoury snacks were the top contributors to discretionary foods whereas Breakfast cereals were the top contributor to additional foods.
- Discretionary foods contributed 41% of free sugars intake and additional foods contributed 17% of free sugars intake. The contribution of Sugar-containing soft drinks increased significantly with age, from 3% to 13% among females and 4% to 15% among males. In contrast, the contribution of Yoghurts and dairy desserts significantly decreased with age, from 9% to 3% among females and from 10% to 3% among males.

- The differences in consumption of discretionary and additional foods between children and young people living in the most versus least deprived areas were small, with two exceptions.
    - First, children and young people living in the most deprived areas were significantly less like to consume Cakes, pastries and puddings than those living in the least deprived areas (consumed by 47% versus 69%).
    - Second, the percentage contribution of Sugar-containing soft drinks to free sugars among children and young people living in the most deprived areas was more than double that of those living in the least deprived areas (12% versus 5%).

Executive Summary Table 4. Weighted percentage contribution to energy and nutrients of discretionary and additional foods in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

	% Consumers	% Energy	% Total fat	% Saturated fat	% Free sugars
Discretionary foods					
Sweet biscuits	58%	4%	4%	5%	9%
Cakes, pastries and puddings	61%	6%	6%	7%	10%
Crisps and savoury snacks	65%	5%	7%	2%	0%
Confectionery	50%	4%	4%	5%	11%
Ice creams and ice lollies	22%	1%	1%	2%	3%
Sugar-containing soft drinks	39%	1%	0%	0%	8%
Total discretionary foods		21%	22%	21%	41%
Additional foods					
Breakfast cereals	70%	6%	2%	2%	9%
Roast potatoes and chips	55%	3%	4%	2%	0%
Pizza	30%	4%	4%	4%	2%
Yoghurts and dairy desserts	47%	2%	2%	4%	6%
Ready meals	8%	1%	1%	1%	0%
Total additional foods		16%	13%	13%	17%

Food and Drink Behaviours in Secondary School Pupils

About half of young people in secondary school reported buying food or drink off school grounds during their lunch break at least once in a usual school week (54% overall, 55% of females and 54% of males). Most who reported purchasing food or drink off school grounds did so 1-2 days a week, not every day.

The majority of young people in secondary school reported never drinking energy drinks (74% overall, 70% of females and 79% of males). 10% of young people reported drinking energy drinks weekly.

Food Insecurity

Overall, a lack of money or other resources in the previous 12 months resulted in 22% of parents/guardians reporting being worried about running out of food, 17% having smaller meals than usual or skipping meals, 7% running out of food and 7% eating less to leave more

for their child/children (see **Executive Summary Table 5**). There were significant differences in food insecurity by quintile of Scottish Index of Multiple Deprivation (SIMD). Nearly half (44%) of parents/guardians living in the most deprived areas reported worrying about running out of food versus 6% of those in the least deprived areas. Nearly one-fifth (17%) of parents/guardians living in the most deprived areas reported running out of food versus 1% of those in the least deprived areas.

Executive Summary Table 5. Weighted percentage of household food insecurity, by Scottish Index of Multiple Deprivation, in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

In the previous 12 months…	Overall	Scottish Index of Multiple Deprivation quintile				
		1st (Most Deprived)	2nd	3rd	4th	5th (Least Deprived)
Worried about running out of food	22%	44%	30%	16%	13%	6%
Had smaller meals than usual or skipped meals	17%	38%	21%	14%	9%	4%
Ran out of food	7%	17%	8%	3%	3%	1%
Ate less to leave more for your child / children	7%	17%	8%	3%	3%	1%

Conclusions

Findings of this cross-sectional representative survey of children and young people living in Scotland confirm that poor diets continue to be a significant challenge, especially for young people aged 11 to 15 years. The findings also highlight the critical need to address food insecurity for households with children and young people, particularly those in the most deprived areas of Scotland where nearly half of parents/guardians reported worrying about running out of food.

Continued efforts are needed to ensure everyone in Scotland eats well. These measures should focus on reducing intake of free sugars, saturated fat and salt. Action is also needed to increase intake of fibre. Trade-offs exist. For example, breakfast cereals contribute to high free sugars intakes but also are a major source of fibre and iron. Meat and meat products contribute to high saturated fat and sodium intakes but also are a major source of selenium. Opportunities to address these trade-offs exist in reformulation by the food and drink sector, as well as broader shifts of diets in children and young people, particularly to include more vegetables, fruits and whole grains.

Chapter 1. Introduction

1.1. Background

Poor diet is a leading contributor to poor health outcomes in Scotland including dental caries, obesity, type 2 diabetes, hypertension, cardiovascular disease and some cancers.[1] The latest Scottish Health Survey (SHeS) reported that in 2023 17% of children were at risk of obesity.[2] Data from the Child Health Surveillance Programme show high levels of socioeconomic inequality, particularly in the proportion of children entering primary school at risk of obesity. While the proportion has remained relatively stable or declined slightly in children in the least deprived areas (7.2% in 2011/12 to 6.4% in 2023/24), it has increased in children in the most deprived areas (11.9% in 2011/12 to 14.0% in 2023/24).[3] Other evidence of poor diet in Scottish children comes from dental surveys, which show that while dental health has improved over the past 20 years, in 2023, 18% of primary 7 children had obvious decay experience.[4]

A Scotland where everyone eats well is a key public health priority, highlighted in A Healthier Future: Scotland's Diet and Healthy Weight Delivery Plan (2018). To achieve this vision, several policy interventions have been adopted in recent years. Many of these policies aim to improve the food environment, recognising that the environments in which children and young people live, learn and play shape their health and wellbeing.[5,6] Current food environments in Scotland do not support healthy food choices.[7] Proposed regulations such as restricting the promotions of food and drink high in fat, sugar or salt (HFSS) aim to transform the food environment and make it easier for people to consume a healthy diet.

The Good Food Nation (Scotland) Act 2022 requires that Scottish Ministers, health boards, local authorities and other specified public authorities prepare and publish good food plans. With regards to children and young people, universal free school meals are provided for children in primary 1 to 5 in Scotland, and, in 2021, new Nutritional Requirements for Food and Drink in Schools (Scotland) Regulations 2020 took effect.

Several UK-wide measures have also been taken to protect children from unhealthy foods. In 2018, the Soft Drinks Industry Levy came into force and may have contributed to a reduction in the number of children and young people having a tooth removed due to tooth decay by 12%.[8] Further to this, from 1 October 2025, a 9pm TV watershed for advertising HFSS products and a restriction of paid-for HFSS advertising online will be introduced simultaneously. The TV watershed will include on-demand programme services.

Despite these efforts, information on children and young people's consumption of select foods collected as part of SHeS suggest that poor diets continue to be a significant challenge. Comprehensive information on the diet of Scottish children is scant, with the only comprehensive surveys designed to investigate this topic being carried out in 2006 and 2010.[9,10]

To fill this gap, a cross-sectional representative survey of children and young people living in Scotland aged 2 to 15 years was conducted in 2024: the Dietary Intake in Scotland's CHildren

(DISH) survey. Diet data were collected from up to four 24-hour dietary recalls per child using an online platform called Intake24.

1.2. Aims

The aims of this report on the analysis of the DISH survey were:

1. To assess how the dietary intake of Scottish children and young people compares to the Scottish Dietary Goals, overall and by sex, age group and Scottish Index of Multiple Deprivation quintiles (SIMD quintiles).

2. To assess how the micro-nutrient intake of Scottish children and young people compares with the UK Reference Nutrient Intakes (RNIs) and Lower Reference Nutrient Intakes (LRNI), overall and by sex, age group and SIMD.

3. To assess consumption of food groups and the contribution of food groups to energy and nutrient intake among Scottish children and young people, overall and by sex, age group, and SIMD.

4. To assess consumption of discretionary and additional foods of policy relevance[1] and their contribution to energy, total fat, saturated fat and free sugars intake among Scottish children and young people, overall and by sex, age group and SIMD.

Among young people in secondary school, two further aims were:

5. To assess how frequently they purchase food or drink off school grounds during their lunch break, and to establish the main motivators for doing so, overall and by sex.

6. To assess how frequently they purchase energy drinks, and to establish the main motivators for doing so, overall and by sex.

Parents/guardians were also asked a series of four questions relating to household food insecurity which are reported overall and by sex, age group and SIMD.

[1] The Scottish Government's consultation on proposed regulations to restrict the promotion of HFSS products includes detail on the foods that would be subject to restriction. The list of foods includes 'discretionary' foods and drinks: confectionery, sweet biscuits, crisps and savoury snacks, cakes, sweet pastries, sugary drinks, puddings, ice cream and dairy desserts. The consultation also proposes 'additional' categories captured by existing promotional restrictions in England: breakfast cereals, sweetened yogurt and fromage frais, pizza, ready meals, and roast potatoes, chips and similar potato products.

1.3. Format of this report

Chapter 2 details the methodology used in the DISH survey and the statistical analyses underlying results presented in this report. Chapter 3 summarises characteristics of DISH survey participants. Chapters 4 to 9 correspond to each of the six aims presented in **Section 1.2**. At the end of Chapters 4 to 7, key messages are provided in a blue box. Chapter 10 summarises key messages of the survey, discusses the results relative to other diet surveys, and provides recommendations for future research and policy. Throughout the report, pink boxes are used to call out important information to aid the interpretation of results.

Chapter 2. Methodology

2.1. Survey sample

2.1.1. Power calculations and sample size

The target sample size was 1,700 children and young people aged 2 to 15 years at the time of survey initiation who completed at least one dietary recall. This is comparable to the adult sample size for the 2018 Intake24 Pilot (1,363 completing at least one online dietary recall)[11] and the 2010 Survey of Diet in children in Scotland (1,657 completing a food frequency questionnaire).[10]

PASS 2019 software (NCSS, Kaysville, UT, USA) was used to estimate the required sample size to achieve confidence interval widths of 0.10, 0.20 and 0.30 for the proportion meeting a given Scottish Dietary Goal, using the Exact (Clopper-Pearson) formula for two-sided confidence intervals (CI) and assuming a confidence level of 95%.[12,13] The most conservative estimates (for a proportion meeting a given goal of 50%) indicate that a sample size of 47 is needed to estimate a 95% CI with a width of 0.30, 104 for a width of 0.20 and 402 for a width of 0.10. A width of 0.10 is typically considered a narrow CI, and so the proportion will be estimated relatively precisely. A width of 0.50 or more is typically considered a wide CI, and so there will be relatively greater uncertainty regarding the estimated proportion.

2.1.2. Sampling frame

The Royal Mail's small user Postcode Address File (PAF) was used as the sampling frame for the address selection. This is in line with the large population-based household surveys run by the Scottish Government. 112,967 addresses were drawn from the PAF (**Table 1**) by the Office of the Chief Statistician, Scottish Government using methodology similar to SHeS. Some addresses have one entry in the sampling frame but contain multiple dwelling units. The PAF identifies these addresses using the Multiple Occupancy Indicator (MOI). All addresses within primary sampling units (PSU, local authorities) were then ordered by six-fold urban-rural classification, SIMD (2020) rank and postcode, and finally systematic random sampling was used to select the required number of addresses for each PSU for the survey. Proportions of children aged 2 to 15 years by local authority were based on National Records of Scotland's mid-2021 population estimates which were the most recent available at the time of sampling.

Table 1. Addresses sampled (n=112,967) from the Royal Mail's small user Postcode Address File by primary sampling unit (local authority).

Primary sampling unit (local authority)	**Target sample proportion**[1] %	**Addresses sampled** % (n)
Aberdeen City	3.9%	3.9% (4,406)
Aberdeenshire	5.4%	5.4% (6,079)
Angus	2.1%	2.1% (2,328)
Argyll and Bute	1.4%	1.4% (1,555)
City of Edinburgh	8.6%	8.6% (9,684)
Clackmannanshire	1.0%	1.0% (1,107)
Dumfries and Galloway	2.5%	2.5% (2,853)
Dundee City	2.6%	2.6% (2,919)
East Ayrshire	2.3%	2.3% (2,564)
East Dunbartonshire	2.2%	2.2% (2,444)
East Lothian	2.2%	2.2% (2,468)
East Renfrewshire	2.2%	2.2% (2,500)
Falkirk	3.0%	3.0% (3,422)
Fife	7.0%	7.0% (7,927)
Glasgow City	10.8%	10.8% (12,182)
Highland	4.2%	4.2% (4,754)
Inverclyde	1.3%	1.3% (1,522)
Midlothian	2.0%	2.0% (2,246)
Moray	1.7%	1.7% (1,976)
Na h-Eileanan Siar	0.5%	0.5% (510)
North Ayrshire	2.4%	2.4% (2,723)
North Lanarkshire	6.8%	6.8% (7,630)
Orkney Islands	0.4%	0.4% (441)
Perth and Kinross	2.7%	2.7% (3,016)
Renfrewshire	3.3%	3.3% (3,678)
Scottish Borders	2.1%	2.1% (2,343)
Shetland Islands	0.5%	0.5% (517)
South Ayrshire	1.9%	1.9% (2,158)
South Lanarkshire	6.1%	6.1% (6,864)
Stirling	1.7%	1.7% (1,875)
West Dunbartonshire	1.7%	1.7% (1,894)
West Lothian	3.9%	3.9% (4,382)

[1] Based on National Records of Scotland's mid-2021 population estimates which were the most recent available at the time of sampling.

The Community Health Index (CHI)-Unique Property Reference Number (UPRN) Residential Linkage (CURL) file was then used by the Electronic Data Research and Innovation Service (eDRIS) to flag which addresses sampled from PAF were eligible for this survey, i.e., had a child aged 2 to 15 years. eDRIS is the Public Health Scotland contact point for organisations wishing to use administrative datasets for research purposes. CURL links the CHI and UPRN, thus enabling the linkage of PAF (address) and CHI (household occupancy) data. The CURL file used for this survey covered addresses that were recorded on CHI up to mid-September 2023. 81% of PAF addresses could be matched to a CHI address by UPRN using CURL. A total of 19,527 (17%) matched addresses had a child aged 2 to 15 years. Letters were sent to these addresses.

In households with more than one child aged 2 and 15 years old, one child was initially randomly selected to participate by the survey software upon starting the survey. To top up the sample, we further invited 400 siblings to participate. These siblings were randomly selected, stratified by SIMD, from households where the index child (meaning, the initially randomly selected child) had completed at least one dietary recall and they had agreed to be contacted for other children aged 2 to 15 years in their household to participate. Only one sibling per household was invited to complete the survey.

2.1.3. Recruitment

Letters (n=19,527) were sent in two batches, the first batch in January 2024 and the second in June 2024. Letters containing an invitation (**Annexe 1**) and Participant Information Sheets (**Annexe 2**) were sent to the parent/guardian in a purple envelope to attract the attention of potential participants. Pilot testing suggested that addressing the letters to the 'Parent or guardian of [name of child]' would increase survey engagement. However, we were not able to include the name of the child as this information was not received from eDRIS. Letters were therefore addressed to 'Parent/Guardian'. Letters briefly introduced the study, the importance of participating, what participants would be asked to do and the incentive. An additional 400 siblings were invited to participate via email invitations in July 2024, as described in the previous section.

To promote awareness of the study, we used social media, asking parents to 'look for the purple envelope' as this means they have been selected to help us understand what children and young people across Scotland are eating. The study was also highlighted in a Scotland-wide STV news segment featuring a family receiving the envelope and completing the survey.

2.1.4. Response rate

In total, 126 letters (0.6% of all letters sent) were returned unopened (**Table 2**). The most frequent reasons for a letter being returned were (as noted verbatim on the Royal Mail return sticker): the addressee was no longer at the address (42%) and the address was incomplete (23%).

Table 2. Reason letters were returned to sender as noted verbatim on the Royal Mail return sticker (n=126).

	% (n)
Addressee no longer at address	42% (53)
Address incomplete	23% (29)
No reason given	13% (16)
Addressee unknown	10% (13)
Address inaccessible	8% (10)
Refused	2% (3)
No such address	2% (2)

Three participants were outside the eligible age range at the time of survey completion and were removed. Thus, the total number of eligible households was 19,398.

A total of 1,700 participants completed at least one valid recall (see **Section 2.6** for details on data cleaning). The response rate was therefore 8.8%. This response rate is comparable to other letter-based surveys in Scotland. For example, in Phase 1 of SHeS 2021, potential participants were contacted by letter and asked to take part in an interview conducted over the phone. The response rate for this phase of SHeS 2021 was 9.7% (productive households as a percent of eligible households).[14]

Households in the most deprived areas had the lowest response rate (**Table 3**).

Table 3. Response rate by Scottish Index of Multiple Deprivation.

	Scottish Index of Multiple Deprivation quintile				
	1st (Most Deprived)	2nd	3rd	4th	5th (Least Deprived)
Number of addresses	4,014	3,789	3,459	4,207	4,058
Number of participants that completed at least one recall	272	330	347	380	371
Unweighted percentage	6.8%	8.7%	10.0%	9.0%	9.1%

A total of 180 participants were siblings of the index child. Survey weights were adjusted for this subset of cases where more than one child in a household was surveyed as described in **Section 2.8**.

2.2. Data collection

2.2.1. Pilot

A pilot study was conducted in order to:

- Ensure all study documents (e.g., invitation letter and Participant Information Sheets) were easy to understand.
- Refine instructions to ensure they were understood in the same way by all participants.
- Ensure the survey and Intake24 were working in the same way across all platform types (e.g., smartphone versus computer versus tablet) and with those using assisted technology (e.g., screen readers).

Face-to-face testing was conducted with six participants and live beta testing was conducted with ten participants. A follow-up interview with live beta testing participants was used to gather feedback on the process. Information from the pilot study was used to update study documents, the survey and Intake24. Changes included, for example:

- Using 'food diary' instead of 'Intake24' to describe the 24-hour dietary recall process.
- Updating Intake24 materials to say 'your child' instead of 'you' to clarify that we were interested in the food and drink consumed by the child not the parent/guardian reporting on behalf of the child.
- Prefacing the food insecurity questions with an explanation for why we collected that information and emphasising that the questions could be skipped if the participant did not feel comfortable answering them.

In addition, following advice from an expert in disordered eating during adolescence, we removed automated dietary feedback following completion of Intake24.

2.2.2. Mode of survey completion

Data collection occurred between 30 January and 19 August 2024. 56% of recalls were completed in February (**Table 4**).

Table 4. Month of the year represented in the dietary data (unweighted sample size 1,700 participants and 4,592 dietary recalls).

	unweighted % (unweighted n)
January	8.6% (394)
February	56% (2,559)
March	11% (484)
April	0.7% (31)
May	0.1% (5)
June	3.4% (157)
July	17% (774)
August	4.1% (188)

The survey was conducted in English. Scotland's Census 2022 found that 94% of people in Scotland aged 3 years and over speak, read and write English.[15] Participants received a unique URL in their letter which led them to complete a survey, after which they were directed to complete their first dietary recall using Intake24. The majority of participants completed the survey including the dietary recall on their smartphone (**Table 5**).

Table 5. Device survey was completed on (unweighted sample size 1,700).

	unweighted % (unweighted n)
Smartphone	87% (1,476)
Computer	13% (215)
Tablet	<1% (9)

2.2.3. Survey

Before beginning their first dietary recall, participants completed a brief (median time to complete: 5 minutes) online survey (**Annexe 3**). Food frequency questions were asked for foods that are Scottish Dietary Goals but may not be consumed every day by most people (meat and fish) or because specific information was requested given policy relevance (toddler milks).

The parent/guardian was asked to answer all questions on this brief online survey, including the food frequency questions, on the child's behalf except a series of questions on purchasing food and drink off school grounds during lunch break, the use of food delivery apps and energy drinks for which secondary school pupils were given the opportunity to answer directly. Only participants who selected 'Yes' to the question, 'Your child may be able to complete the next sections about their food and drink intake themselves. Will they be completing the next section?' were asked these additional questions.

2.2.4. 24-hour dietary recalls

Up to four 24-hour dietary recalls were collected within a 2-week period using Intake24[2] (UK Database, System Version 3, 2019, Cambridge University). Intake24 was developed by Newcastle University, originally with funding from Food Standards Scotland (FSS) and is licenced under the Open Government Licence. The version of Intake24 used for the DISH survey was provided and adapted by the University of Cambridge, based on the original, with technical advisory input from Newcastle University.

At the start of Intake24, participants are prompted to watch a brief video (<5 minutes) explaining how to complete their recall which was developed specifically for the DISH survey. Intake24 is based on the multiple pass method, which guides participants through the previous 24 hours, asking them to recall all food- and drink-consumption occasions. For children in pre-school or primary school, the recall was completed by the parent/guardian with the child's help where appropriate. Children in secondary school had the opportunity to complete the recalls

[2] The link is to the current version of Intake24 which is not the version used in the DISH survey.

themselves; 61% of participants in secondary school reported completing the recall themselves (**Table 6**).

Table 6. Who completed the 24-hour dietary recalls for participants in secondary school (unweighted sample size 469).

	unweighted % (unweighted n)
Second school pupil themselves	61% (284)
Parent/guardian of secondary school pupil	39% (185)

Following completion of their first recall, participants received an invitation to complete their second recall on a randomly selected day within 2 to 6 days of their first recall. This invitation was sent via email. If the requested dietary recall was not completed after 24 hours, a follow up message was sent via email. Additional reminders were sent following a 48-hour time period until the 2-week period since the completion of their first recall had lapsed. The same procedures were followed for the third and fourth recalls. Participants were able to opt out from receiving messages at any time by contacting the study team via email or through the free phone number provided. Up to a maximum of four reminders were sent to each participant, or until the 2-week period had lapsed. 84% of participants completed 2 or more recalls (**Table 7**).

Table 7. Number of 24-hour dietary recalls completed (unweighted sample size 1,700).

	unweighted % (unweighted n)
1 recall	16% (271)
2 recalls	30% (517)
3 recalls	21% (361)
4 recalls	32% (551)

Tuesday and Thursday were over-represented in the dietary data whereas Friday and Saturday were under-represented (**Table 8**). This may in part reflect the date of postage because all letters within a given batch were posted on the same day. However, as noted above, the invitation to complete their second recall was sent on a randomly selected day within 2 to 6 days of their first recall which may have helped even out the spread across days of the week.

Table 8. Day of week represented in the dietary data (unweighted sample size 1,700 participants and 4,592 dietary recalls). Values reported in this table are for the day the recall referred to, not the day the recall was completed.

	unweighted % (unweighted n)
Monday	10% (479)
Tuesday	23% (1,043)
Wednesday	15% (673)
Thursday	20% (905)
Friday	9% (409)
Saturday	7% (321)
Sunday	17% (762)

2.3. Incentive

Participants were given £10 for completing one recall and an additional £10 for completing a second recall (£20 total incentive). The incentive was provided as an Amazon shopping voucher or equivalent and emailed to participants unless they expressed a preference for the voucher to be sent via post. Participants who completed all four recalls were entered into a prize draw to win one of three £100 vouchers.

2.4. Nutrient databank

Each food and drink product in Intake24 is linked to a food composition code from the UK Nutrient Databank (NDB) which provides the nutrient values associated with that food.[16] The NDB is updated regularly with new food codes and revision of existing food codes. NDB version UK_V3_2023 underpins the version of Intake24 used for this study. Conversion factors for grams of macronutrients to calories and sodium to salt are presented in **Table 9**.

Table 9. Conversion factors used for energy and nutrients.

Total carbohydrate	3.75 kcal per g
Free sugars	3.75 kcal per g
Total fat	9 kcal per g
Saturated fat	9 kcal per g
Trans fat	9 kcal per g
Protein	4 kcal per g
Alcohol	7 kcal per g
Sodium	2.498 g salt per g sodium

Values for free sugars and AOAC fibre were used directly from the NDB. The NDB's method for calculating these variables is provided elsewhere.[17] Values for fruit and vegetable consumption and red and red processed meat consumption used to assess adherence to the Scottish Dietary Goals were from disaggregated fruit and vegetable (Beans, Fruit juice, Smoothie, Dried fruit, Fresh fruit, Tomatoes, Tomato puree, Brassicaceae, Yellow, red and dark green leafy vegetables and Other vegetables) and red and red processed meat (Beef,

Lamb, Pork, Processed red meat, Other red meat, Burgers, Sausages and Offal) variables in the NDB.[18]

2.5. Ethics approval

The protocol and study materials were reviewed and approved by the Human Ethical Review Committee at the University of Edinburgh (study number: HERC_2022_086, approved 11 August 2022).

2.6. Data cleaning

The following cleaning was performed on the dietary recall data:

- Breastmilk and vitamin and mineral supplements were excluded from the analysis and so all values reflect intakes from food and drink only.
- 521 reported items (0.7% of the 78,263 items reported) were missing food codes. Of these, 21 were supplements or breastmilk and anyway excluded from the analysis. Of the 500 remaining items missing food codes, 376 items were further missing a description of the food or the portion size and so could not be included in the analysis. The remaining 124 items were manually matched to the most appropriate food code in the NDB.
- Recalls completed in <2 minutes were evaluated by two independent reviewers. In the case of fewer than five recalls [exact number suppressed to prevent identifiability], recalls were deemed improbable and so they were excluded from the analysis.
- Recalls with <5 items were evaluated by two independent reviewers. In the case of fewer than five recalls [exact number suppressed to prevent identifiability], recalls were deemed improbable and so they were excluded from the analysis.
- Recalls with energy intake <400 kcal or >4,000 kcal were evaluated by two independent reviewers. Six were removed because the energy intake was deemed improbable by both reviewers. In the case of fewer than five participants [exact number suppressed to prevent identifiability], both their recalls were deemed improbable and so they were excluded from the analysis.
- Dairy-free items were removed from 'Milk and milk products' and assigned a new category of 'Dairy-free'.

2.7. Usual dietary intake adjustment

The 24-hour dietary recall is considered one of the most accurate (least biased) methods of assessing diet.[19] However, because it only assesses a short period of time, one or even up to four recalls may not capture an individual's usual, or long-run, dietary intake. What we eat varies day to day, and many foods are not consumed on a daily basis. To overcome this limitation, statistical models have been developed to estimate usual intake from 24-hour dietary recall information. In order to be consistent with the National Diet and Nutrition Survey (NDNS), we applied the multiple source method (a statistical model) to estimate individual usual intake of nutrients as well as food groups.[20,21] The multiple source method is based on a shrinkage technique applied to residuals of two regression models: one model for the probability of consumption and one for the amount consumed on consumption days.[20–22] Using

the multiple source method allowed us to include all participants in all analyses, regardless of the number of recalls completed.

Food groups were included in usual intake adjustment if they were consumed by at least 15% of participants. We assumed all participants were habitual consumers of all included food groups. Energy density and the percent contribution of food groups to energy and nutrient intake could not be adjusted for usual intake because they rely on food item-level information and the multiple source method is applied to day-level intake. All other estimates were adjusted for usual intake.

2.8. Survey weights

All results are survey-weighted unless otherwise indicated. Survey weights were derived such that the achieved sample matches the Scottish population distribution in terms of age, sex and SIMD based on 2021 mid-year population estimates from the National Records of Scotland. Weights were proportional to the number of children in the household, and were adjusted for the subset of cases where more than one child in a household was surveyed. In the 11 instances where participants reported 'Prefer not to say' for sex, we calculated the mean survey weight of females and males for their respective age group and SIMD quintile. After deriving the weights for these 11 participants, the full set of weights were re-scaled.

The effective sample size is a metric used to assess the effect of the sample design on the precision of survey estimates. It measures the size of an unweighted simple random sample that would achieve the same precision (standard error) as the sample design used by the survey. Sample designs such as that used in the DISH survey, in which households are sampled rather than individual children, tend to have lower effective sample sizes. The effective sample size for the DISH survey was 1,338. The efficiency of a sample is given by the ratio of the effective sample size to the actual sample size. The DISH survey sample has an efficiency of 79%. This is comparable to the efficiency of the NDNS individual sample (81%) reported for Years 1 and 2 (combined) of the Rolling Programme (2008/2009—2009/10).[23]

2.9. Statistical testing for differences between demographic groups

Differences by age group (2-4y, 5-10y, 11-15y), sex, age group and sex, and SIMD quintile were tested using Wilcoxon rank-sum tests for complex survey samples for continuous outcomes and chi-squared tests with Rao and Scott's second-order correction for binary outcomes. Only statistically significant differences (p-value<0.05) were highlighted in the text of this report. A total of 11 participants (0.6%) reported 'Prefer not to say' for sex and were excluded from any analyses by sex.

Demographic characteristics were compared to Scotland's Census 2022 or mid-2022 population estimates, depending on which had the most comparable estimates.

2.10. Code and data availability

All R script files are available on GitHub. Data, including both raw and usual intake-adjusted dietary intake, will be made available on the UK Data Archive.

Chapter 3. Characteristics of Participants

A total of 1,700 children and young people aged 2 to 15 years participated in this study. 20% were 2 to 4 years old, 43% were 5 to 10 years old, and 37% were 11 to 15 years old (**Table 10**). These proportions are comparable to the mid-2022 population estimates which found among 2- to 15-year-olds living in Scotland that 19% were 2 to 4 years old, 43% were 5 to 10 years old, and 38% were 11 to 15 years old.[24]

48% were female and 51% were male. These proportions are comparable to the mid-2022 population estimates which found among 2- to 15-year-olds living in Scotland that 49% were female and 51% were male.[24]

87% were white, 4.6% had an Asian or Asian British ethnic background, 4.4% had a Mixed or multiple ethnic groups background, 2.6% had a Black, Black British, Caribbean or African ethnic background, and 0.7% reported an 'Other' ethnic background **Table 10**). While not directly comparable, these proportions are higher than Scotland's Census 2022 which found that 7.1% of people of all age groups in Scotland had a minority ethnic background.[25]

17% of households were single-parent households (**Table 10**). This proportion is slightly lower than Scotland's Census 2022 which found that 21% of households with children[3] were single-parent households.[15] 24% of households had three or more children under the age of 18 years.

[3] Scotland's Census 2022 defines dependent children as those living with their parent(s) and under 16 years old, or aged 16 to 18 years in full-time education. This is therefore not directly comparable to our participant sample of children and young people aged 2 to 15 years.

Table 10. Characteristics of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024.

	Overall (n=1,700)[1]	**Female** (n=815)	**Male** (n=874)
Age, years	9 (5, 12)	9 (5, 13)	8 (5, 11)
Age group			
2-4y	20% (413)	19% (187)	20% (225)
5-10y	43% (698)	39% (309)	48% (388)
11-15y	37% (589)	42% (319)	32% (261)
Ethnicity			
White	87% (1,497)	86% (717)	88% (774)
Asian or Asian British	4.6% (79)	5.2% (43)	3.9% (35)
Mixed or multiple ethnic groups	4.4% (73)	4.5% (36)	4.3% (37)
Black, Black British, Caribbean or African	2.6% (28)	3.1% (14)	2.1% (14)
Other	0.7% (11)	0.1% (<5[2])	1.3% (10)
Prefer not to say	0.7% (12)	0.7% (<5[2])	0.3% (<5[2])
Scottish Index of Multiple Deprivation quintile			
1st (Most Deprived)	22% (272)	20% (124)	23% (147)
2nd	19% (330)	20% (159)	19% (170)
3rd	18% (347)	19% (169)	18% (173)
4th	21% (380)	21% (184)	20% (195)
5th (Least Deprived)	20% (371)	20% (179)	20% (189)
Stage of education			
Pre-school	20% (426)	20% (196)	21% (229)
Primary school	50% (805)	45% (352)	55% (451)
Secondary school	30% (469)	36% (267)	24% (194)
Number of adults in household			
1	17% (275)	17% (126)	18% (146)
2	75% (1,298)	73% (615)	77% (675)
3 or more	7.7% (127)	9.9% (74)	5.7% (53)
Number of children in household			
1	28% (647)	29% (318)	26% (325)
2	48% (791)	46% (374)	49% (411)
3 or more	24% (262)	24% (123)	25% (138)

Values are weighted percentage (unweighted n) or weighted median (weighted interquartile range).

[1] Includes 11 participants who reported 'Prefer not to say' for sex.

[2] Exact number suppressed to prevent identifiability.

Chapter 4. Achievement of Scottish Dietary Goals

4.1. Background

The Scottish Dietary Goals describe, in nutritional terms, the diet that will improve and support the health of the Scottish population.[26] They provide the basis of a healthy balanced diet to reduce diet-related conditions and are used for scientific monitoring purposes, underpinning diet and health policy in Scotland.

FSS are currently undertaking work to review and update the Scottish Dietary Goals to ensure they reflect current scientific evidence on diets and align with the policy landscape in Scotland. The Goals were last updated in 2016[26] to take account of new recommendations from the Scientific Advisory Committee on Nutrition (SACN) on sugar and fibre.[27,28]

For this report, several changes were made to the definitions of the Scottish Dietary Goals, as summarised in **Table 11**.

Table 11. Definition of achieving Scottish Dietary Goals in children and young people aged 2 to 15 years living in Scotland.

	Current Scottish Dietary Goal[26]	Definition for DISH survey
Energy	Energy density of the diet to be ≤125 kcal/100g	Energy density of food and milk consumed to be ≤125 kcal/100g[1]
Total fat	Total fat intake to be ≤35% of food energy	Total fat intake to be ≤35% of energy excluding ethanol[2]
Saturated fat	Saturated fat intake to be ≤11% of food energy	Saturated fat intake to be ≤10% of energy excluding ethanol[3]
Trans fat	Trans fat intake to be <1% of food energy	Trans fat intake to be <1% of energy excluding ethanol
Free sugars	Free sugars intake to be ≤5% of total energy	Free sugars intake to be ≤5% of energy excluding ethanol
Total carbohydrate	Total carbohydrate intake to be ~50% of total energy	Total carbohydrate intake to be 45-55% of energy excluding ethanol
Fibre	Fibre intake to be ≥30 g/day in adults and in line with SACN recommendations in children: ≥15 g/day for 2-4y ≥20 g/day for 5-10y ≥25 g/day for 11-15y	Fibre intake to be: ≥15 g/day for 2-4y ≥20 g/day for 5-10y ≥25 g/day for 11-15y
Salt	Salt intake to be <6 g/day in adults	Salt intake to be: <2 g/day for 2-3y <3 g/day for 4-6y <5 g/day for 7-10y <6 g/day for 11-15y
Fruit and vegetables	Fruit and vegetable consumption to be >400 g/day in adults	Fruit and vegetable consumption to be >400 g/day in adults[4]
Red and red processed meat[5]	Red and red processed meat consumption to be ≤70 g/day in adults	Red and red processed meat consumption to be ≤70 g/day in adults
Oily fish	A portion (140 g in adults) of oily fish consumed at least once per week	A portion of oily fish consumed at least once per week[6]

[1] In order to be consistent with previous monitoring of the Scottish Dietary Goals based on secondary analysis of purchase data from the Scottish subsample of the UK Living Costs and Food Survey,[29] the calculation of energy density excludes the following non-milk drinks: Fruit juice, Smoothies 100% fruit and/or juice, Soft drinks not low calorie concentrated, Soft drinks not low calorie carbonated, Soft drinks not low calorie RTD (ready-to-drink) still, Soft drinks low calorie concentrated, Soft drinks low calorie carbonated, Soft drinks low calorie RTD still, Coffee, Tea, Herbal tea (made-up weight), Bottled water still or carbonated and Tap water only.

[2] All macronutrients in the DISH survey have been reported based on energy intake excluding ethanol, according to the latest SACN guidance.[30]

[3] A cut-point of 10% was used for saturated fat instead of 11%, according to the latest SACN guidance.[30]

[4] Allows for up to 40 g beans and 75 g fruit juice or smoothie in children aged 2 to 10 years and up to 80 g beans and 150 g fruit juice or smoothie in young people aged 11 to 15 years.

[5] No specific goal for children, 70 g/day is adult-specific and provided for comparison.

[6] Adherence to the oily fish Scottish Dietary Goal calculated based on a food frequency question asked during the survey.

4.2. Overall achievement

The mean, median, standard deviation, standard error, 25th percentile and 75th percentile for all Scottish Dietary Goals overall and by demographic group are provided in **Annexe Tables 1** (Excel). The overall weighted mean for all Goals is presented in **Table 12**. On average, overall, children and young people were meeting the Scottish Dietary Goals for total fat, trans fat and total carbohydrate as well as the adult goal for red and red processed meat. However, on average, overall, children and young people did not meet any of the other goals. Diets were too energy dense, too high in saturated fat, free sugars and salt, and too low in fibre, fruit and vegetables and oily fish.

Table 12. Weighted mean intakes relative to the Scottish Dietary Goals in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

	Goal	**Met Goal Overall**	**Overall** (Mean)	**2-4y** (Mean)	**5-10y** (Mean)	**11-15y** (Mean)
Energy	≤125 kcal/100g	X	166	146	163	181
Total fat	≤35% of energy	✓	34%	33%	34%	34%
Saturated fat	≤10% of energy	X	13%	13%	13%	13%
Trans fat	<1% of energy	✓	0.5%	0.5%	0.5%	0.5%
Free sugars	≤5% of energy	X	11%	9%	10%	12%
Total carbohydrate	45-55% of energy	✓	51%	52%	51%	51%
Fibre	≥15 g/day for 2-4y ≥20 g/day for 5-10y ≥25 g/day for 11-15y	X	15.7	13.8	15.9	16.5
Salt[1]	<2 g/day for 2-3y <3 g/day for 4-6y <5 g/day for 7-10y <6 g/day for 11-15y	X	4.2	3.3	4.2	4.6
Fruit and vegetables[2]	≥400 g/day in adults	X	272	279	274	265
Red and red processed meat	≤70 g/day in adults	✓	41	28	40	48
Oily fish[3]	A portion at least once per week	X	16%	17%	17%	15%

[1] Values do not fully take account of salt added during cooking and exclude salt added at the table by participants.
[2] Allows for up to 40 g beans and 75 g fruit juice or smoothie in children aged 2 to 10 years and up to 80 g beans and 150 g fruit juice or smoothie in young people aged 11 to 15 years.
[3] Values are from a food frequency question and reflect the percentage reporting consuming oily fish at least once per week.

4.3. Energy density

On average, energy density was above the goal of 125 kcal/100g, overall and across all demographic groups (**Table 13**). The energy density of diets increased significantly with age. There was not a significant difference in energy density by sex or SIMD.

Table 13. Energy density of diets of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

	Weighted mean, kcal/100g	Weighted percent meeting goal
Goal	≤125	
Overall	166	15%
Sex		
Females	167	14%
Males	166	15%
Age group		
2-4y	146***	27%***
5-10y	163***	16%***
11-15y	181***	7%***
Age and sex group		
Females, 2-4y	145***	30%***
Females, 5-10y	164***	14%***
Females, 11-15y	180***	7%***
Males, 2-4y	147***	24%***
Males, 5-10y	162***	16%***
Males, 11-15y	183***	8%***
Scottish Index of Multiple Deprivation quintile		
1st (Most Deprived)	170	11%
2nd	168	15%
3rd	165	15%
4th	165	16%
5th (Least Deprived)	165	16%

***p<0.001

4.4. Total fat

On average, total fat intake met the goal of ≤35% of energy, overall and across all demographic groups (**Table 14**). There was not a nutritionally meaningful difference in total fat intake by sex, age or SIMD.

Older children have higher energy requirements and so consume more food. Therefore, higher absolute intakes (i.e., grams) in older children are not commented on in the text of this report because this result is expected.

Table 14. Total fat intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

	Weighted mean, g/day	Weighted mean, % of energy excluding ethanol	Weighted percent meeting goal
Goal		≤35%	
Overall	60	34%	61%
Sex			
Females	57***	34%	59%
Males	53***	33%	63%
Age group			
2-4y	47***	33%**	67%
5-10y	60***	34%**	60%
11-15y	66***	34%**	59%
Age and sex group			
Females, 2-4y	46***	33%**	69%
Females, 5-10y	57***	34%**	59%
Females, 11-15y	61***	34%**	55%
Males, 2-4y	49***	33%**	65%
Males, 5-10y	63***	34%**	61%
Males, 11-15y	72***	34%**	65%
Scottish Index of Multiple Deprivation quintile			
1st (Most Deprived)	60	34%	62%
2nd	59	33%	63%
3rd	59	33%	62%
4th	61	34%	55%
5th (Least Deprived)	61	34%	63%

***p<0.001
**p<0.01

4.5. Saturated fat

On average, saturated fat intake was above the goal of ≦10% of energy, overall and across all demographic groups (**Table 15**). There was not a nutritionally meaningful difference in saturated fat intake by sex, age or SIMD.

Table 15. Saturated fat intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

	Weighted mean, g/day	Weighted mean, % of energy excluding ethanol	Weighted percent meeting goal
Goal		≤10%	
Overall	23	13%	13%
Sex			
Females	21***	13%	13%
Males	24***	13%	12%
Age group			
2-4y	19***	13%**	13%
5-10y	23***	13%**	12%
11-15y	24***	13%**	14%
Age and sex group			
Females, 2-4y	18***	13%**	16%
Females, 5-10y	21***	13%**	11%
Females, 11-15y	22***	13%**	15%
Males, 2-4y	20***	13%**	10%
Males, 5-10y	24***	13%**	12%
Males, 11-15y	27***	13%**	13%
Scottish Index of Multiple Deprivation quintile			
1st (Most Deprived)	22	12%**	16%
2nd	22	13%**	13%
3rd	22	13%**	11%
4th	23	13%**	9%
5th (Least Deprived)	23	13%**	14%

***p<0.001
**p<0.01

4.6. Trans fat

On average, trans fat intake met the goal of <1% of energy, overall and across all demographic groups (**Table 16**). There was not a nutritionally meaningful difference in trans fat intake by sex, age or SIMD.

Table 16. Trans fat intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

	Weighted mean, g/day	Weighted mean, % of energy excluding ethanol	Weighted percent meeting goal
Goal		<1%	
Overall	0.9	0.5%	99%
Sex			
Females	0.8***	0.5%	99%
Males	0.9***	0.5%	99%
Age group			
2-4y	0.7***	0.5%*	100%
5-10y	0.9***	0.5%*	99%
11-15y	0.9***	0.5%*	99%
Age and sex group			
Females, 2-4y	0.7***	0.5%**	100%
Females, 5-10y	0.8***	0.5%**	100%
Females, 11-15y	0.9***	0.5%**	99%
Males, 2-4y	0.8***	0.5%**	99%
Males, 5-10y	0.9***	0.5%**	99%
Males, 11-15y	1.0***	0.5%**	100%
Scottish Index of Multiple Deprivation quintile			
1st (Most Deprived)	0.8	0.5%*	99%
2nd	0.9	0.5%*	100%
3rd	0.9	0.5%*	99%
4th	0.9	0.5%*	99%
5th (Least Deprived)	0.9	0.5%*	100%

***p<0.001
**p<0.01
*p<0.05

4.7. Free sugars

On average, free sugars intake was above the goal of ≤5% of energy, overall and across all demographic groups (**Table 17**). Young people aged 11 to 15 years were about half as likely to meet the goal for free sugars as children aged 2 to 4 years (6% versus 14%, respectively). There was not a nutritionally meaningful difference in free sugars intake by sex or SIMD.

Table 17. Free sugars intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

	Weighted mean, g/day	Weighted mean, % of energy excluding ethanol	Weighted percent meeting goal
Goal		≤5%	
Overall	46	11%	8%
Sex			
Females	43**	11%	7%*
Males	49**	11%	10%*
Age group			
2-4y	33***	9%***	14%***
5-10y	45***	10%***	8%***
11-15y	55***	12%***	6%***
Age and sex group			
Females, 2-4y	31***	9%***	12%***
Females, 5-10y	42***	10%***	8%***
Females, 11-15y	50***	12%***	4%***
Males, 2-4y	34***	9%***	16%***
Males, 5-10y	47***	10%***	8%***
Males, 11-15y	61***	12%***	8%***
Scottish Index of Multiple Deprivation quintile			
1st (Most Deprived)	47	11%	9%
2nd	47	11%	8%
3rd	46	11%	7%
4th	45	11%	6%
5th (Least Deprived)	45	10%	11%

***p<0.001
**p<0.01
*p<0.05

4.8. Total carbohydrate

On average, total carbohydrate intake met the goal of ~50% of energy, overall and across all demographic groups (**Table 18**). There was not a nutritionally meaningful difference in total carbohydrate intake by sex, age or SIMD.

Table 18. Total carbohydrate intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

	Weighted mean, g/day	Weighted mean, % of energy excluding ethanol	Weighted percent meeting goal
Goal		~50%	
Overall	215	51%	68%
Sex			
Females	201***	51%	68%
Males	228***	51%	68%
Age group			
2-4y	175***	52%*	67%
5-10y	217***	51%*	68%
11-15y	234***	51%*	68%
Age and sex group			
Females, 2-4y	168***	52%	68%
Females, 5-10y	202***	51%	69%
Females, 11-15y	216***	51%	66%
Males, 2-4y	181***	51%	65%
Males, 5-10y	229***	51%	67%
Males, 11-15y	256***	51%	70%
Scottish Index of Multiple Deprivation quintile			
1st (Most Deprived)	216	51%	64%
2nd	214	51%	67%
3rd	216	51%	68%
4th	211	50%	67%
5th (Least Deprived)	218	51%	74%

***p<0.001
**p<0.01
*p<0.05

4.9. Fibre

On average, fibre intakes were below the age-specific goal, overall and across all demographic groups (**Table 19**). Grams of fibre consumed per day was significantly higher among males versus females and those living in SIMD 5 (Least Deprived) versus SIMD 1 (Most Deprived). Young people aged 11 to 15 years were significantly less likely to achieve the fibre goal (7%) compared to younger children (17% of children aged 5 to 10 years met the goal and 32% of children aged 2 to 4 years).

Table 19. Fibre intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

	Weighted mean, g/day	Weighted percent meeting goal
Goal	≥15 g/day for 2-4y ≥20 g/day for 5-10y ≥25 g/day for 11-15y	
Overall	15.7	16%
Sex		
Females	14.8***	12%***
Males	16.6***	21%***
Age group		
2-4y	13.8***	32%***
5-10y	15.9***	17%***
11-15y	16.5***	7%***
Age and sex group		
Females, 2-4y	13.5***	32%***
Females, 5-10y	14.7***	11%***
Females, 11-15y	15.4***	4%***
Males, 2-4y	14.1***	33%***
Males, 5-10y	16.7***	21%***
Males, 11-15y	17.8***	12%***
Scottish Index of Multiple Deprivation quintile		
1st (Most Deprived)	14.8**	11%***
2nd	15.1**	12%***
3rd	15.6**	17%***
4th	16.0**	17%***
5th (Least Deprived)	17.0**	25%***

***p<0.001
**p<0.01

4.10. Salt

Urine collected over a 24-hour period is the best method to measure salt intake. However, in the DISH survey, salt intake was estimated using dietary recalls. Salt intake values reported here do not fully take account of salt added during cooking and exclude salt added at the table by participants. In addition, salt values of packaged foods and foods consumed out of the home are not brand-specific or up-to-date and so may be mismeasured. As a result of these limitations, it is expected that salt intakes will be underestimated.[31] This should be considered when interpreting the findings for salt.

On average, estimated salt intake was below the goal, overall and across all demographic groups except children aged 2 to 4 years (**Table 20**). Grams of salt consumed per day were significantly higher in males versus females and males were significantly less likely to meet the salt goal (54% met the goal versus 67% of females). Children aged 2 to 4 years were significantly less likely to meet the goal for salt intake (17%) versus children aged 5 to 10 years (60%) and young people aged 11 to 15 years (85%). There was not a significant difference in salt intake by SIMD.

Table 20. Estimated salt intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

	Weighted mean, g/day	Weighted percent meeting goal
Goal	<2 g/day for 2-3y <3 g/day for 4-6y <5 g/day for 7-10y <6 g/day for 11-15y	
Overall	4.2	61%
Sex		
Females	4.0***	67%***
Males	4.4***	54%***
Age group		
2-4y	3.3***	17%***
5-10y	4.2***	60%***
11-15y	4.6***	85%***
Age and sex group		
Females, 2-4y	3.1***	17%***
Females, 5-10y	4.0***	64%***
Females, 11-15y	4.3***	92%***
Males, 2-4y	3.4***	16%***
Males, 5-10y	4.3***	57%***
Males, 11-15y	5.0***	75%***
Scottish Index of Multiple Deprivation quintile		
1st (Most Deprived)	4.3	55%
2nd	4.2	61%
3rd	4.1	63%
4th	4.1	62%
5th (Least Deprived)	4.2	62%

***p<0.001

4.11. Fruit and vegetables

Fruit and vegetable intake includes fruits and vegetables consumed as stand-alone items (e.g., an apple or carrot stick) as well as fruits and vegetables consumed in mixed dishes (e.g., an apple pie or tomato sauce on a pizza).

On average, fruit and vegetable consumption was below the goal for adults of 400 g/day, overall and across all demographic groups (**Table 21**). Those living in SIMD 5 (Least Deprived) had significantly higher fruit and vegetable consumption compared to those in SIMD 1 (Most Deprived). There was not a nutritionally meaningful difference in fruit and vegetable consumption by sex or age.

Table 21. Fruit and vegetable consumption of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).[1]

	Weighted mean, g/day
Goal	≥400 g/day in adults
Overall	272
Sex	
Females	262**
Males	281**
Age group	
2-4y	279
5-10y	274
11-15y	265
Age and sex group	
Females, 2-4y	269**
Females, 5-10y	261**
Females, 11-15y	261**
Males, 2-4y	288**
Males, 5-10y	284**
Males, 11-15y	270**
Scottish Index of Multiple Deprivation quintile	
1st (Most Deprived)	229***
2nd	265***
3rd	276***
4th	286***
5th (Least Deprived)	305***

[1] Allows for up to 40 g beans and 75 g fruit juice or smoothie in children aged 2 to 10 years and up to 80 g beans and 150 g fruit juice or smoothie in young people aged 11 to 15 years.
***p<0.001
**p<0.01

Fresh fruit was the largest contributor to total fruit and vegetable consumption, followed by fruit juice/smoothies and vegetables (**Table 22**).

Table 22. Weighted mean fresh fruit, dried fruit, fruit juice/smoothie, beans and vegetable consumption (g/day) of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).[1]

	Fresh fruit	Dried fruit	Fruit juice/ smoothie	Beans	Vegetables
Overall	127	2.2	90	7.9	85
Sex					
Females	126.8**	2.2***	89.5	7.9*	84.9
Males	118.9**	1.8***	82.2	8.0*	84.1
Age group					
2-4y	154.1***	3.6***	89.4	8.1***	71.5***
5-10y	142.2***	2.0***	86.2	7.7***	80.0***
11-15y	94.1***	1.6***	93.6	8.1***	97.8***
Age and sex group					
Females, 2-4y	147.2***	3.1***	79.0	8.9***	69.8***
Females, 5-10y	134.8***	1.6***	80.3	7.2***	77.0***
Females, 11-15y	91.2***	1.4***	85.4	8.4***	97.2***
Males, 2-4y	160.4***	4.0***	98.7	7.3***	73.0***
Males, 5-10y	147.9***	2.4***	90.6	8.1***	82.4***
Males, 11-15y	97.6***	2.0***	104.0	7.6***	98.5***
Scottish Index of Multiple Deprivation quintile					
1st (Most Deprived)	103.4***	1.3***	89.8	6.2*	75.0***
2nd	123.0***	1.8***	93.2	7.9*	80.8***
3rd	130.0***	2.4***	84.3	7.8*	82.8***
4th	135.6***	2.4***	92.6	9.6*	90.5***
5th (Least Deprived)	143.8***	3.0***	87.4	8.2*	95.5***

[1] Values for beans and fruit juice/smoothie are not capped in these estimates.
***p<0.001
**p<0.01
*p<0.05

The current Scottish Dietary Goals do not specify different portion sizes for children for fruit and vegetables. To explore portions of fruit and vegetables, we used the Scottish Government's school meal guidance,[32] as follows:

- One portion of fruit and vegetables is 40 g for 2-10y and 80 g for 11-16y
- One portion of dried fruit is 15 g for 2-10y and 30 g for 11-16y
- Beans are capped at one portion (40 g for 2-10y and 80 g for 11-16y)
- Fruit juice is not allowed in the Scottish Government's school meal guidance but has been included and capped at one portion (75 g for 2-10y and 150 g for 11-16y).

Based on portions of fruit and vegetables, on average, children 2 to 4 years and 5 to 10 years consumed the recommended ≥5 portions/day (**Table 23**). However, young people 11 to 15 years were well below the goal. Those living in SIMD 5 (Least Deprived) had significantly higher fruit and vegetable consumption compared to those in SIMD 1 (Most Deprived), a difference of about one portion per day.

Table 23. Portions of fruit and vegetables consumed by children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

	Weighted mean, portions/day
Goal	≥5 portions/day
Overall	5.2
Sex	
Females	4.8***
Males	5.6***
Age group	
2-4y	6.6***
5-10y	6.4***
11-15y	3.0***
Age and sex group	
Females, 2-4y	6.4***
Females, 5-10y	6.1***
Females, 11-15y	2.9***
Males, 2-4y	6.9***
Males, 5-10y	6.7***
Males, 11-15y	3.0***
Scottish Index of Multiple Deprivation quintile	
1st (Most Deprived)	4.5***
2nd	5.1***
3rd	5.2***
4th	5.6***
5th (Least Deprived)	5.7***

***p<0.001
**p<0.01

We also looked at the most frequently reported stand-alone vegetables and fruits (i.e., not including vegetables and fruits in mixed dishes such as tomatoes in pizza). The most frequently reported stand-alone vegetables were cucumber (16% of reported vegetables), carrots (14%), tomatoes (11%), and broccoli and peas (each 10%) (**Table 24**).[4]

Table 24. Most frequently reported stand-alone vegetables (i.e., not including tomatoes in pizza) of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

	Cucumber	Carrots	Tomatoes	Broccoli	Peas
Overall	15.9% (679)	14.4% (616)	11.1% (475)	9.5% (408)	10.3% (442)
Sex					
Females	16.6% (341)	13.7% (282)	11.9% (245)	9.8% (202)	10.0% (205)
Males	15.4% (335)	15.0% (327)	10.2% (223)	9.3% (202)	10.6% (232)
Age group					
2-4y	18.2% (208)	14.8% (169)	7.7% (88)	10.0% (114)	13.1% (149)
5-10y	17.0% (310)	15.3% (280)	11.5% (210)	9.3% (170)	10.0% (182)
11-15y	12.3% (161)	12.7% (167)	13.5% (177)	9.5% (124)	8.5% (111)
Age and sex group					
Females, 2-4y	19.2% (102)	12.4% (66)	8.8% (47)	9.8% (52)	13.0% (69)
Females, 5-10y	18.0% (133)	15.7% (116)	12.0% (89)	10.4% (77)	10.0% (74)
Females, 11-15y	13.5% (106)	12.8% (100)	13.9% (109)	9.3% (73)	7.9% (62)
Males, 2-4y	17.5% (106)	17.0% (103)	6.8% (41)	10.2% (62)	12.7% (77)
Males, 5-10y	16.4% (177)	14.9% (161)	11.2% (121)	8.5% (92)	9.9% (107)
Males, 11-15y	10.5% (52)	12.7% (63)	12.3% (61)	9.7% (48)	9.7% (48)
Scottish Index of Multiple Deprivation quintile					
1st (Most Deprived)	14.4% (59)	16.1% (66)	10.5% (43)	11.7% (48)	10.9% (45)
2nd	15.7% (104)	15.4% (102)	9.7% (64)	9.4% (62)	10.9% (72)
3rd	14.2% (127)	13.0% (116)	11.3% (101)	9.9% (88)	11.8% (105)
4th	17.8% (191)	14.5% (156)	11.9% (128)	9.2% (99)	9.8% (105)
5th (Least Deprived)	198 (16%)	176 (14%)	139 (11%)	111 (9%)	115 (9%)

Values are unweighted % (unweighted n).

[4] The most frequently reported vegetables are determined at the item level, and a participant may have consumed multiple of the same or varying vegetables. Presented results are the overall frequency of reported items.

The most frequently reported stand-alone fruits were apples (21% of reported fruits), bananas (19%), grapes (11%) and strawberries (10%) (**Table 25**).[5]

Table 25. Most frequently reported stand-alone fruits (i.e., not including apples in a pie) of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

	Apples	Bananas	Grapes	Strawberries
Overall	21.1% (1,488)	19.3% (1,362)	11.4% (804)	10.1% (708)
Sex				
Females	20.2% (658)	17.4% (567)	11.9% (387)	10.9% (356)
Males	22.1% (827)	21.0% (788)	10.9% (409)	9.4% (351)
Age group				
2-4y	17.3% (399)	21.8% (504)	10.5% (242)	10.3% (238)
5-10y	24.4% (775)	17.3% (550)	11.7% (372)	10.4% (330)
11-15y	20.3% (314)	19.9% (308)	12.3% (190)	9.0% (140)
Age and sex group				
Females, 2-4y	16.3% (163)	21.0% (210)	11.5% (115)	10.7% (107)
Females, 5-10y	24.1% (327)	15.3% (208)	11.8% (160)	11.5% (156)
Females, 11-15y	18.7% (168)	16.6% (149)	12.5% (112)	10.4% (93)
Males, 2-4y	18.0% (235)	22.4% (292)	9.7% (127)	10.1% (131)
Males, 5-10y	24.6% (448)	18.7% (340)	11.6% (212)	9.6% (174)
Males, 11-15y	23.1% (144)	25.0% (156)	11.2% (70)	7.4% (46)
Scottish Index of Multiple Deprivation quintile				
1st (Most Deprived)	23.7% (189)	25.8% (205)	11.2% (89)	10.3% (82)
2nd	22.6% (288)	22.2% (282)	14.8% (188)	9.7% (123)
3rd	19.4% (290)	18.6% (279)	11.5% (173)	11.3% (169)
4th	20.2% (339)	17.8% (299)	10.0% (167)	9.9% (166)
5th (Least Deprived)	21.3% (382)	16.5% (297)	10.4% (187)	9.3% (168)

Values are unweighted % (unweighted n).

[5] The most frequently reported fruits are determined at the item level, and a participant may have consumed multiple of the same or varying fruits. Presented results are the overall frequency of reported items.

4.12. Red and red processed meat

On average, red and red processed meat consumption was 41 g/day as compared to the maximum intake recommended for adults of 70 g/day (**Table 26**). Grams of red and red processed meat consumed per day were significantly higher in males versus females. There was not a significant difference in red and red processed meat consumption by SIMD.

Table 26. Red and red processed meat consumption of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

	Weighted mean, g/day
Goal[1]	≤70 g/day in adults
Overall	41
Sex	
Females	37***
Males	44***
Age group	
2-4y	28***
5-10y	40***
11-15y	48***
Age and sex group	
Females, 2-4y	26***
Females, 5-10y	38***
Females, 11-15y	41***
Males, 2-4y	31***
Males, 5-10y	41***
Males, 11-15y	57***
Scottish Index of Multiple Deprivation quintile	
1st (Most Deprived)	43
2nd	41
3rd	39
4th	41
5th (Least Deprived)	39

***p<0.001

4.13. Oily fish

Because the Scottish Dietary Goal for oily fish is a weekly goal, oily fish was assessed using a food frequency question instead of up to four 24-hour dietary recalls. The question asked how often the child eats oily fish (e.g., fresh, frozen or canned salmon, herring, kippers, mackerel, sardines, trout or pilchards. Does NOT include tuna). We therefore do not have portions of oily fish, only frequency of consumption.

The majority of children and young people reported never consuming oily fish, overall and across all demographic groups except those living in SIMD 5 (Least Deprived) who were significantly less likely to report never consuming oily fish (**Table 27**).

Table 27. Oily fish consumption of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).[1]

	Times per week				At least once per week
	>1	1	<1	Never	
Overall	3%	14%	23%	60%	16%
Sex					
Females	3%	13%	21%	60%	16%
Males	2%	14%	24%	59%	16%
Age group					
2-4y	2%	15%	20%	61%	17%
5-10y	3%	14%	22%	60%	17%
11-15y	3%	12%	24%	59%	15%
Age and sex group					
Females, 2-4y	3%	16%	18%	60%	19%
Females, 5-10y	3%	14%	22%	60%	17%
Females, 11-15y	3%	11%	21%	61%	14%
Males, 2-4y	2%	14%	23%	60%	16%
Males, 5-10y	2%	14%	22%	60%	17%
Males, 11-15y	2%	13%	27%	58%	15%
Scottish Index of Multiple Deprivation quintile					
1st (Most Deprived)	3%	10%	19%	63%	13%***
2nd	2%	8%	15%	74%	10%***
3rd	2%	16%	21%	60%	19%***
4th	4%	16%	25%	54%	20%***
5th (Least Deprived)	2%	17%	32%	48%	19%***

[1] Fewer than five participants (exact number suppressed to prevent identifiability) reported consuming oily fish every day or 4-6 times a week and were combined with those reporting 2-3 times a week to create the category >1 time per week.
***p<0.001

4.14. Key messages: Scottish Dietary Goals

- Most children and young people achieved the Scottish Dietary Goals for total fat, trans fat and total carbohydrate.
- Overall and across all demographic groups, diets were too energy dense. Only 15% of children and young people met the energy density goal (mean 166 kcal/100g as compared to the goal of ≤125 kcal/100g).
- Overall and across all demographic groups, saturated fat intake was too high. Only 13% of children and young people met the saturated fat goal (mean 13% of energy as compared to the goal of ≤10% of energy).
- Overall and across all demographic groups, free sugars intake was too high. Only 8% of children and young people met the free sugars goal (mean 11% of energy as compared to the goal of ≤5% of energy).
- Overall and across all demographic groups, fibre intake was too low. While 32% of children aged 2 to 4 years met the goal (mean 13.8 g/day as compared to the goal of ≥15 g/day), only 7% of young people 11 to 15 years met the goal (mean 16.5 g/day as compared to the goal of ≥25 g/day).
- Young people 11 to 15 years tended to have less healthy diets than the younger age groups, with higher energy density, a greater percentage of calories from free sugars, lower fibre intake, and fewer portions of fruit and vegetables.
- Only 16% of children and young people consumed oily fish at least once a week.
- There were few differences in adherence to the Scottish Dietary Goals by SIMD. The two exceptions were fibre and fruit and vegetables. Children and young people living in the least deprived areas were more than twice as likely to meet the fibre goal than those living in the most deprived areas (25% versus 11%, mean intake 17.0 g/day versus 14.8 g/day). Those living in the least deprived areas also had significantly higher fruit and vegetable consumption compared to those living in the most deprived areas, a difference of about one portion per day (5.7 portions/day versus 4.5 portions/day; 305 g/day versus 229 g/day).

Chapter 5. Energy and Nutrient Intake

5.1. Background

Recommended intakes for nutrients have existed in the UK for more than 50 years. The latest full report of dietary reference values for energy and nutrients was published in 1991[33] with an update to energy values published by SACN in 2011[34] and fibre in 2015.[28] The purpose of dietary reference values is to provide a benchmark against which current dietary intakes can be assessed to determine if the population or certain groups within the population are getting enough to cover their needs. The recommendations were set at the upper end of the range in order to err on the side of caution and minimise the risk of undernutrition.

For energy, estimated average requirement (EAR) is used to assess adequacy. This is the estimated average energy needed for healthy people. Carbohydrates including free sugars and fibre, and fat including saturated fat and trans fat, were presented in **Chapter 4**. This chapter presents energy, protein, vitamin and mineral intake.

For vitamins and minerals, the RNI and LRNI are used.

- The RNI is the nutrient intake that is adequate for 97.5% of the population. It is therefore considerably higher than what most people need. Those consuming the RNI for a given nutrient are unlikely to be deficient in that nutrient.
- The LRNI is the intake that is adequate for 2.5% of the population. Most people will need to consume more than the LRNI to cover their nutrient requirement. Those consuming habitually lower than the LRNI are likely to be or become deficient in that nutrient.

A couple of points regarding the methodology for this chapter with regards to the RNI and LRNI:

- For each participant, we calculated whether their usual intake-adjusted nutrient intake was above or below the LRNI for their respective age and sex group. The weighted percentage of participants below the LRNI was reported, overall and by demographic group. When the percentage of participants below the LRNI was >10%, it was called out in the text and tables.
- In addition, for each participant, we calculated their usual intake-adjusted nutrient intake as a percentage of the RNI for their respective age and sex group. For example, in the hypothetical case of a 7-year-old male with a usual intake-adjusted protein intake of 53.1 g, their intake as % RNI would be (53.1 g/28.3 g [*the RNI for their age and sex group*])*100 or 188%. The weighted mean nutrient intake as % RNI has been reported, overall and by demographic group.
- All participants were included in these calculations regardless of the number of recalls completed and all nutrient values are adjusted for usual intake.

The mean, median, standard deviation, standard error, 25th percentile (Q1), 75th percentile (Q3), and intake relative to the EAR, RNI, and/or LRNI for energy, protein, vitamins, and minerals overall and by demographic group are provided in **Annexe Tables 2** (Excel). The intakes presented represent intakes from food and drink excluding supplements. Supplement use is reported in **Section 5.6**.

A method called doubly labelled water is a tool used to assess the degree of under-reporting in diet surveys. The method generally works by drinking water enriched in two naturally occurring stable isotopes (^{2}H and ^{18}O) and tracking the excretion of these isotopes from the body through analyses of samples of urine collected over 1 to 2 weeks. Based on this excretion, a mean daily rate of CO_2 production is calculated, and, from this, a daily estimate of energy expenditure. This serves as a proxy for energy intake.

Doubly labelled water was not used in the DISH survey. However, the most recent doubly labelled water sub-study of NDNS (2019/20 and 2020/22) found that energy intake reported using Intake24 was, on average, 20% lower than doubly labelled water in children aged 4 to 10 years, with little difference by sex.[35] In young people aged 11 to 15 years, energy intake was under-reported using Intake24 by 32% in males and 26% in females.[35]

The doubly labelled water method cannot tell us what foods and drinks are under-reported, only that under-reporting is likely and could be quite substantial. Results throughout this chapter should be interpreted in light of this limitation.

5.2. Energy

Energy intake in children aged 2 to 10 years was at the EAR but energy intake in young people aged 11 to 15 years was below the EAR (**Table 28**). This may reflect under-reporting in this age group rather than consumption below recommended intake. There was not a significant difference in energy intake by SIMD.

Table 28. Energy intake (kcal/day) of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

	Weighted mean, kcal/day	Weighted mean, as % EAR
Overall	1,587	92%
Sex		
Females	1,488***	88%***
Males	1,681***	95%***
Age group		
2-4y	1,281***	113%***
5-10y	1,600***	96%***
11-15y	1,734***	75%***
Age and sex group		
Females, 2-4y	1,232***	114%***
Females, 5-10y	1,495***	93%***
Females, 11-15y	1,596***	72%***
Males, 2-4y	1,324***	111%***
Males, 5-10y	1,681***	98%***
Males, 11-15y	1,907***	79%***
Scottish Index of Multiple Deprivation quintile		
1st (Most Deprived)	1,592	94%
2nd	1,568	90%
3rd	1,579	90%
4th	1,580	91%
5th (Least Deprived)	1,611	92%

***p<0.001

5.3. Protein

On average, protein intake was above the RNI overall and across all demographic groups (**Table 29**). Protein intake was significantly higher in males versus females. Protein intake as a % RNI significantly decreased with age. There was not a significant difference in protein intake by SIMD.

Table 29. Protein intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		RNI, g/day	
Females	2-3y	14.5	
	4-6y	19.7	
	7-10y	28.3	
	11-14y	41.2	
	15y	45.4	
Males	2-3y	14.5	
	4-6y	19.7	
	7-10y	28.3	
	11-14y	42.1	
	15y	55.2	
		Weighted mean, g/day	Weighted mean, as % RNI
Overall		61	224
Sex			
Females		56***	207***
Males		65***	240***
Age group			
2-4y		49***	309***
5-10y		61***	245***
11-15y		66***	154***
Age and sex group			
Females, 2-4y		48***	301***
Females, 5-10y		58***	234***
Females, 11-15y		59***	139***
Males, 2-4y		51***	316***
Males, 5-10y		64***	254***
Males, 11-15y		76***	172***
Scottish Index of Multiple Deprivation quintile			
1st (Most Deprived)		61	235
2nd		60	219
3rd		61	223
4th		60	221
5th (Least Deprived)		62	222

***p<0.001

5.4. Vitamins

5.4.1. Vitamin A

On average, vitamin A intake was at the RNI overall and across all demographic groups except young people aged 11 to 15 years for whom intake was slightly below the RNI (**Table 30**). Vitamin A intake was significantly higher in males versus females. Vitamin A intake as a % RNI significantly decreased with age. 15% of females aged 11 to 15 years had vitamin A intakes below the LRNI. Those living in SIMD 5 (Least Deprived) had significantly higher vitamin A intake than those in SIMD 1 (Most Deprived).

Table 30. Vitamin A intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		RNI, µg/day	LRNI, µg/day	
Females	2-3y	400	200	
	4-6y	400	200	
	7-10y	500	250	
	11-14y	600	250	
	15y	600	250	
Males	2-3y	400	200	
	4-6y	400	200	
	7-10y	500	250	
	11-14y	600	250	
	15y	700	300	
		Weighted mean, µg/day	Weighted mean, as % RNI	Weighted % below LRNI
Overall		509	103	10%
Sex				
Females		488*	98*	**12%***
Males		528*	108*	7%*
Age group				
2-4y		492*	123***	5%**
5-10y		492*	106***	9%**
11-15y		538*	88***	**13%****
Age and sex group				
Females, 2-4y		475*	119***	6%*
Females, 5-10y		463*	101***	**11%***
Females, 11-15y		519*	86***	**15%***
Males, 2-4y		508*	127***	4%*
Males, 5-10y		514*	111***	7%*
Males, 11-15y		562*	91***	10%*
Scottish Index of Multiple Deprivation quintile				
1st (Most Deprived)		465***	96***	**13%***
2nd		498***	101***	**11%***
3rd		504***	102***	9%*
4th		541***	109***	6%*
5th (Least Deprived)		538***	108***	9%*

***p<0.001
**p<0.01
*p<0.05
Bolded purple indicates the percentage of participants below the LRNI was >10%.

5.4.2. Riboflavin

On average, riboflavin intake was above the RNI overall and across all demographic groups (**Table 31**). Riboflavin intake was significantly higher in males versus females. As a % RNI, riboflavin intake significantly decreased with age. 20% of females aged 11 to 15 years had riboflavin intakes below the LRNI. There was not a significant difference in riboflavin intake by SIMD.

Table 31. Riboflavin intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		RNI, mg/day	LRNI, mg/day	
Females	2-3y	0.6	0.3	
	4-6y	0.8	0.4	
	7-10y	1.0	0.5	
	11-14y	1.1	0.8	
	15y	1.1	0.8	
Males	2-3y	0.6	0.3	
	4-6y	0.8	0.4	
	7-10y	1.0	0.5	
	11-14y	1.2	0.8	
	15y	1.3	0.8	
		Weighted mean, mg/day	Weighted mean, as % RNI	Weighted % below LRNI
Overall		1.5	160	6%
Sex				
Females		1.3***	147***	9%**
Males		1.6***	172***	4%**
Age group				
2-4y		1.4**	214***	0%***
5-10y		1.5**	166***	1%***
11-15y		1.4**	124***	**16%*** **
Age and sex group				
Females, 2-4y		1.4***	212***	0%***
Females, 5-10y		1.4***	150***	1%***
Females, 11-15y		1.3***	116***	**20%*** **
Males, 2-4y		1.4***	216***	0%***
Males, 5-10y		1.7***	179***	1%***
Males, 11-15y		1.6***	134***	**12%*** **
Scottish Index of Multiple Deprivation quintile				
1st (Most Deprived)		1.5	165	5%
2nd		1.4	155	5%
3rd		1.5	160	7%
4th		1.5	158	5%
5th (Least Deprived)		1.5	161	8%

***p<0.001
**p<0.01
*p<0.05
Bolded purple indicates the percentage of participants below the LRNI was >10%.

5.4.3. Folate

On average, folate intake was above the RNI overall and across all demographic groups except females aged 11 to 15 years for whom intake was slightly below the RNI (**Table 32**). Folate intake was significantly higher in males versus females. Folate intake as a % RNI significantly decreased with age. There was not a nutritionally meaningful difference in folate intake by SIMD.

Table 32. Folate intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		RNI, µg/day	LRNI, µg/day	
Females	2-3y	70	35	
	4-6y	100	50	
	7-10y	150	75	
	11-14y	200	100	
	15y	200	100	
Males	2-3y	70	35	
	4-6y	100	50	
	7-10y	150	75	
	11-14y	200	100	
	15y	200	100	
		Weighted mean, µg/day	Weighted mean, as % RNI	Weighted % below LRNI
Overall		195	147	3%
Sex				
Females		181***	136***	3%
Males		207***	158***	3%
Age group				
2-4y		175***	224***	0%***
5-10y		198***	153***	1%***
11-15y		201***	100***	7%***
Age and sex group				
Females, 2-4y		174***	224***	0%***
Females, 5-10y		180***	140***	1%***
Females, 11-15y		185***	93***	7%***
Males, 2-4y		177***	223***	0%***
Males, 5-10y		212***	162***	0%***
Males, 11-15y		220***	110***	8%***
Scottish Index of Multiple Deprivation quintile				
1st (Most Deprived)		195*	155	4%
2nd		185*	141	4%
3rd		199*	148	3%
4th		192*	143	1%
5th (Least Deprived)		201*	149	3%

***p<0.001
*p<0.05

5.4.4. Vitamin D

Our main source of vitamin D is sunlight. However, in Scotland, we do not get enough sunlight between October to March to meet our requirements for vitamin D. Since vitamin D is only found in a small number of foods such as oily fish, eggs and some fortified foods such as breakfast cereals, it is difficult to get enough vitamin D from foods alone. FSS therefore recommends everyone including children should consider taking a daily supplement containing 10 micrograms/µg of vitamin D (400 IU), particularly during the winter months (October to March).[36] It is further recommended that children under 5 years old take a supplement all year round. Supplement use including supplements containing vitamin D is reported in **Section 5.6**. In this section, vitamin D intake from foods is reported but we do not compare intake of vitamin D from foods to the RNI given that it is not expected children and young people will achieve the RNI from foods alone.[37]

Average vitamin D intake from foods was 2 µg/day with no nutritionally meaningful difference by sex, age or SIMD (**Table 33**).

Table 33. Vitamin D intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

	Weighted mean, µg/day
Overall	2
Sex	
Females	2*
Males	3*
Age group	
2-4y	2
5-10y	2
11-15y	2
Age and sex group	
Females, 2-4y	3*
Females, 5-10y	2*
Females, 11-15y	2*
Males, 2-4y	2*
Males, 5-10y	2*
Males, 11-15y	3*
Scottish Index of Multiple Deprivation quintile	
1st (Most Deprived)	2
2nd	2
3rd	2
4th	2
5th (Least Deprived)	2

*p<0.05

5.4.5. Vitamin B_{12}

On average, vitamin B_{12} intake was considerably above the RNI overall and across all demographic groups (**Table 34**). Vitamin B_{12} intake was significantly higher in males versus females. Vitamin B_{12} intake as a % RNI significantly decreased with age. There was not a significant difference in vitamin B_{12} intake by SIMD.

Table 34. Vitamin B_{12} intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		RNI, µg/day	LRNI, µg/day	
Females	2-3y	0.5	0.3	
	4-6y	0.8	0.5	
	7-10y	1.0	0.6	
	11-14y	1.2	0.8	
	15y	1.5	1.0	
Males	2-3y	0.5	0.3	
	4-6y	0.8	0.5	
	7-10y	1.0	0.6	
	11-14y	1.2	0.8	
	15y	1.5	1.0	
		Weighted mean, µg/day	Weighted mean, as % RNI	Weighted % below LRNI
Overall		4.3	467	1%
Sex				
Females		3.8***	424***	1%
Males		4.6***	509***	0%
Age group				
2-4y		4.0*	688***	0%**
5-10y		4.4*	475***	0%**
11-15y		4.2*	341***	2%**
Age and sex group				
Females, 2-4y		4.0***	695***	0%**
Females, 5-10y		4.0***	436***	0%**
Females, 11-15y		3.6***	289***	3%**
Males, 2-4y		4.0***	681***	0%**
Males, 5-10y		4.7***	504***	0%**
Males, 11-15y		5.0***	405***	1%**
Scottish Index of Multiple Deprivation quintile				
1st (Most Deprived)		4.3	490	1%
2nd		4.1	451	1%
3rd		4.4	476	2%
4th		4.1	453	0%
5th (Least Deprived)		4.3	464	1%

***p<0.001
**p<0.01
*p<0.05

5.4.6. Vitamin C

On average, vitamin C intake was considerably above the RNI overall and across all demographic groups (**Table 35**). Vitamin C intake was significantly higher in males versus females. Vitamin C intake as a % RNI significantly decreased with age. Those living in SIMD 5 (Least Deprived) had significantly higher vitamin C intake than those in SIMD 1 (Most Deprived), but, on average, all SIMD quintiles were well above the RNI.

Table 35. Vitamin C intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		RNI, mg/day	LRNI, mg/day	
Females	2-3y	30	8	
	4-6y	30	8	
	7-10y	30	8	
	11-14y	35	9	
	15y	40	10	
Males	2-3y	30	8	
	4-6y	30	8	
	7-10y	30	8	
	11-14y	35	9	
	15y	40	10	
		Weighted mean, mg/day	Weighted mean, as % RNI	Weighted % below LRNI
Overall		82	256	0%
Sex				
Females		77***	238***	0%
Males		87***	273***	0%
Age group				
2-4y		79	263***	0%
5-10y		81	272***	0%
11-15y		84	233***	1%
Age and sex group				
Females, 2-4y		76*	255***	0%
Females, 5-10y		76*	253***	1%
Females, 11-15y		78*	216***	0%
Males, 2-4y		81*	270***	0%
Males, 5-10y		86*	286***	0%
Males, 11-15y		92*	255***	1%
Scottish Index of Multiple Deprivation quintile				
1st (Most Deprived)		76*	241*	1%
2nd		80*	248*	0%
3rd		82*	257*	0%
4th		84*	263*	0%
5th (Least Deprived)		87*	271*	0%

***p<0.001
*p<0.05

5.5. Minerals

5.5.1. Iron

On average, iron intake was at the RNI overall and across all demographic groups except females aged 11 to 15 years for whom intake was below the RNI (**Table 36**). 43% of females aged 11 to 15 years had iron intakes below the LRNI. Iron intake was significantly higher in males versus females. Iron intake as a % RNI significantly decreased with age, particularly among females. There was not a nutritionally meaningful difference in iron intake by SIMD.

Table 36. Iron intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		RNI, mg/day	LRNI, mg/day	
Females	2-3y	6.9	3.7	
	4-6y	6.1	3.3	
	7-10y	8.7	4.7	
	11-14y	14.8	8.0	
	15y	14.8	8.0	
Males	2-3y	6.9	3.7	
	4-6y	6.1	3.3	
	7-10y	8.7	4.7	
	11-14y	11.3	6.1	
	15y	11.3	6.1	
		Weighted mean, mg/day	Weighted mean, as % RNI	Weighted % below LRNI
Overall		9.0	102	**11%**
Sex				
Females		8.4***	89***	**19%*** **
Males		9.7***	115***	3%***
Age group				
2-4y		7.7***	117***	1%***
5-10y		9.0***	118***	2%***
11-15y		9.7***	76***	**28%*** **
Age and sex group				
Females, 2-4y		7.5***	114***	1%***
Females, 5-10y		8.3***	109***	3%***
Females, 11-15y		8.8***	60***	**43%*** **
Males, 2-4y		7.9***	120***	1%***
Males, 5-10y		9.6***	124***	1%***
Males, 11-15y		10.9***	96***	8%***
Scottish Index of Multiple Deprivation quintile				
1st (Most Deprived)		9.1*	107*	**12%**
2nd		8.6*	97*	**13%**
3rd		9.1*	102*	10%
4th		9.0*	101*	9%
5th (Least Deprived)		9.4*	104*	**11%**

***p<0.001
**p<0.01
*p<0.05
Bolded purple indicates the percentage of participants below the LRNI was >10%.

5.5.2. Calcium

On average, calcium intake was above the RNI overall and across all demographic groups except young people aged 11 to 15 years for whom intake was slightly below the RNI (**Table 37**). Calcium intake was significantly higher in males versus females. Calcium intake as a % RNI significantly decreased with age. There was not a significant difference in calcium intake by SIMD.

Table 37. Calcium intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		RNI, mg/day	LRNI, mg/day	
Females	2-3y	350	200	
	4-6y	450	275	
	7-10y	550	325	
	11-14y	800	450	
	15y	800	450	
Males	2-3y	350	200	
	4-6y	450	275	
	7-10y	550	325	
	11-14y	1000	480	
	15y	1000	480	
		Weighted mean, mg/day	Weighted mean, as % RNI	Weighted % below LRNI
Overall		845	150	4%
Sex				
Females		776***	140***	5%
Males		910***	160***	4%
Age group				
2-4y		792**	208***	0%***
5-10y		882**	172***	1%***
11-15y		829**	93***	10%***
Age and sex group				
Females, 2-4y		759***	201***	0%***
Females, 5-10y		806***	158***	1%***
Females, 11-15y		755***	94***	10%***
Males, 2-4y		821***	215***	0%***
Males, 5-10y		940***	183***	1%***
Males, 11-15y		921***	92***	10%***
Scottish Index of Multiple Deprivation quintile				
1st (Most Deprived)		841	155	5%
2nd		837	149	6%
3rd		836	148	3%
4th		846	150	3%
5th (Least Deprived)		862	148	4%

***p<0.001
**p<0.01

5.5.3. Magnesium

On average, magnesium intake was above the RNI overall and across all demographic groups except young people aged 11 to 15 years among whom it was below the RNI (**Table 38**). 40% of females and 21% of males aged 11 to 15 years had magnesium intakes below the LRNI. Magnesium intake was significantly higher in males versus females. Magnesium intake as a % RNI significantly decreased with age. There was not a significant difference in magnesium intake by SIMD.

Table 38. Magnesium intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		RNI, mg/day	LRNI, mg/day	
Females	2-3y	85	50	
	4-6y	120	70	
	7-10y	200	115	
	11-14y	280	180	
	15y	300	190	
Males	2-3y	85	50	
	4-6y	120	70	
	7-10y	200	115	
	11-14y	280	180	
	15y	300	190	
		Weighted mean, mg/day	Weighted mean, as % RNI	Weighted % below LRNI
Overall		206	120	**19%**
Sex				
Females		192***	110***	**19%*** **
Males		219***	129***	7%***
Age group				
2-4y		179***	189***	0%***
5-10y		206***	124***	2%***
11-15y		219***	77***	**32%*** **
Age and sex group				
Females, 2-4y		173***	184***	0%***
Females, 5-10y		192***	116***	5%***
Females, 11-15y		201***	71***	**40%*** **
Males, 2-4y		184***	193***	0%***
Males, 5-10y		218***	130***	1%***
Males, 11-15y		242***	85***	**21%*** **
Scottish Index of Multiple Deprivation quintile				
1st (Most Deprived)		202	123	**13%**
2nd		200	116	**13%**
3rd		204	117	**13%**
4th		207	119	10%
5th (Least Deprived)		217	122	**14%**

***p<0.001

Bolded purple indicates the percentage of participants below the LRNI was >10%.

5.5.4. Potassium

On average, potassium intake was well above the RNI overall and across all demographic groups except young people aged 11 to 15 years among whom it was below the RNI (**Table 39**). 21% of females and 12% of males aged 11 to 15 years had potassium intakes below the LRNI. Potassium intake was significantly higher in males versus females. Potassium intake as a % RNI significantly decreased with age. There was not a significant difference in potassium intake by SIMD.

Table 39. Potassium intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		RNI, mg/day	LRNI, mg/day	
Females	2-3y	800	450	
	4-6y	1100	600	
	7-10y	2000	950	
	11-14y	3100	1600	
	15y	3500	2000	
Males	2-3y	800	450	
	4-6y	1100	600	
	7-10y	2000	950	
	11-14y	3100	1600	
	15y	3500	2000	
		Weighted mean, mg/day	Weighted mean, as % RNI	Weighted % below LRNI
Overall		2,211	130	7%
Sex				
Females		2,069***	120***	10%***
Males		2,346***	141***	4%***
Age group				
2-4y		1,921***	217***	0%***
5-10y		2,238***	140***	1%***
11-15y		2,334***	74***	**17%*** **
Age and sex group				
Females, 2-4y		1,851***	211***	0%***
Females, 5-10y		2,092***	132***	2%***
Females, 11-15y		2,147***	68***	**21%*** **
Males, 2-4y		1,984***	223***	0%***
Males, 5-10y		2,352***	145***	0%***
Males, 11-15y		2,568***	81***	**12%*** **
Scottish Index of Multiple Deprivation quintile				
1st (Most Deprived)		2,180	136	5%***
2nd		2,215	131	6%***
3rd		2,205	129	7%***
4th		2,182	128	8%***
5th (Least Deprived)		2,275	128	7%***

***p<0.001

Bolded purple indicates the percentage of participants below the LRNI was >10%.

5.5.5. Iodine

On average, iodine intake was well above the RNI overall and across all demographic groups except females aged 11 to 15 years (**Table 40**). 20% of females aged 11 to 15 years had iodine intakes below the LRNI. Iodine intake was significantly higher in males versus females. There was not a significant difference in iodine intake by SIMD.

Table 40. Iodine intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		RNI, µg/day	LRNI, µg/day	
Females	2-3y	70	40	
	4-6y	100	50	
	7-10y	110	55	
	11-14y	130	65	
	15y	140	70	
Males	2-3y	70	40	
	4-6y	100	50	
	7-10y	110	55	
	11-14y	130	65	
	15y	140	70	
		Weighted mean, µg/day	Weighted mean, as % RNI	Weighted % below LRNI
Overall		139	120	8%
Sex				
Females		128***	110***	**11%*** **
Males		149***	130***	5%***
Age group				
2-4y		131***	115***	4%***
5-10y		147***	138***	3%***
11-15y		134***	101***	**15%*** **
Age and sex group				
Females, 2-4y		127***	111***	5%***
Females, 5-10y		141***	133***	4%***
Females, 11-15y		116***	88***	**20%*** **
Males, 2-4y		134***	119***	3%***
Males, 5-10y		151***	142***	2%***
Males, 11-15y		156***	118***	8%***
Scottish Index of Multiple Deprivation quintile				
1st (Most Deprived)		136	119	9%
2nd		134	116	7%
3rd		138	120	8%
4th		139	120	5%
5th (Least Deprived)		146	125	8%

***p<0.001
Bolded purple indicates the percentage of participants below the LRNI was >10%.

5.5.6. Selenium

On average, selenium intake was well above the RNI overall and across all demographic groups except young people aged 11 to 15 years among whom it was below the RNI (**Table 41**). Selenium intake was significantly higher in males versus females. Selenium intake as a % RNI significantly decreased with age. There was not a significant difference in selenium intake by SIMD.

Table 41. Selenium intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		RNI, µg/day	LRNI, µg/day	
Females	2-3y	15	7	
	4-6y	20	10	
	7-10y	30	16	
	11-14y	45	25	
	15y	60	40	
Males	2-3y	15	7	
	4-6y	20	10	
	7-10y	30	16	
	11-14y	45	25	
	15y	70	40	
		Weighted mean, µg/day	Weighted mean, as % RNI	Weighted % below LRNI
Overall		34	112	9%
Sex				
Females		32***	104***	**14%*** **
Males		36***	120***	4%***
Age group				
2-4y		28***	133***	0%***
5-10y		34***	132***	0%***
11-15y		37***	78***	**24%*** **
Age and sex group				
Females, 2-4y		28***	132***	0%***
Females, 5-10y		33***	128***	0%***
Females, 11-15y		33***	70***	**33%*** **
Males, 2-4y		28***	135***	0%***
Males, 5-10y		35***	135***	0%***
Males, 11-15y		43***	88***	**13%*** **
Scottish Index of Multiple Deprivation quintile				
1st (Most Deprived)		35	119	8%
2nd		33	108	9%
3rd		34	111	**11%**
4th		34	111	10%
5th (Least Deprived)		35	113	7%

***p<0.001
Bolded purple indicates the percentage of participants below the LRNI was >10%.

5.5.7. Zinc

On average, zinc intake was below the RNI overall and across all demographic groups except males aged 5 to 10 years among whom it was at the RNI (**Table 42**). Zinc intake was significantly higher in males versus females. 20% of females and 13% of males aged 11 to 15 years had zinc intakes below the LRNI. There was not a nutritionally meaningful difference in zinc intake by SIMD.

Table 42. Zinc intake of children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		RNI, mg/day	LRNI, mg/day	
Females	2-3y	5.0	3.0	
	4-6y	6.5	4.0	
	7-10y	7.0	4.0	
	11-14y	9.0	5.3	
	15y	7.0	4.0	
Males	2-3y	5.0	3.0	
	4-6y	6.5	4.0	
	7-10y	7.0	4.0	
	11-14y	9.0	5.3	
	15y	9.5	5.5	
		Weighted mean, mg/day	Weighted mean, as % RNI	Weighted % below LRNI
Overall		6.8	90	10%
Sex				
Females		6.3***	84***	**13%****
Males		7.3***	96***	7%**
Age group				
2-4y		5.8***	83***	4%***
5-10y		6.8***	99***	6%***
11-15y		7.3***	83***	**17%*****
Age and sex group				
Females, 2-4y		5.5***	80***	5%***
Females, 5-10y		6.4***	94***	8%***
Females, 11-15y		6.5***	77***	**20%*****
Males, 2-4y		6.0***	87***	4%***
Males, 5-10y		7.1***	104***	4%***
Males, 11-15y		8.3***	92***	**13%*****
Scottish Index of Multiple Deprivation quintile				
1st (Most Deprived)		6.8	92*	8%
2nd		6.5	87*	**12%**
3rd		6.8	91*	**11%**
4th		6.7	91*	8%
5th (Least Deprived)		7.0	92*	10%

***p<0.001
**p<0.01
*p<0.05
Bolded purple indicates the percentage of participants below the LRNI was >10%.

5.6. Supplement use

43% of children and young people reported taking a dietary supplement on at least one of up to four days of dietary recalls (**Table 43**). The most frequently reported supplements were supplements containing Vitamin A, supplements containing Vitamin D and multivitamins.

Table 43. Frequency of supplements reported by children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

Supplement Containing	Unweighted frequency of participants reporting use
Vitamin A	317
Vitamin D	168
Multiple vitamins and minerals	147
Vitamin C	47
Fish Oil	38
Calcium	29
Iron	23
Magnesium	10
Vitamin B12	3
Vitamin B6	2
Thiamine	2
Vitamin B2	1
Copper	1
Vitamin E	1

5.7. Key messages: Energy and Nutrients

- On average, overall, energy intake was 92% of the EAR. Energy intake in children aged 2 to 10 years was at the EAR but energy intake in young people aged 11 to 15 years was below the EAR. This may reflect under-reporting in this age group rather than consumption below recommended intake.
- On average, overall, intake of protein and micro-nutrients was at or above the RNI except for zinc, which was below the RNI overall.
- However, in females 11 to 15 years old, vitamin A, folate, iron, calcium, magnesium, potassium, iodine and selenium intake were below the RNI.
- Likewise, in males 11 to 15 years old, vitamin A, iron, calcium, magnesium, potassium and selenium intake were below the RNI.
- The percentage of participants below the LRNI was less than 10% for all nutrients in 2- to 4-year-olds and 5- to 10-year-olds. However, this percentage was at or above 10% in 11- to 15-year-olds for vitamin A, riboflavin, iron, calcium, magnesium, potassium, iodine, selenium and zinc.

Chapter 6. Food Groups

6.1. Background

This chapter presents information on the consumption of food groups as well as the contribution of food groups to energy, free sugars, fibre, saturated fat and select nutrients. In particular, we present nutrients from **Chapter 5** meeting both of the following two criteria:

(1) A demographic group has a mean intake as % of RNI below 100% and
(2) The percentage of a demographic group with intakes below the LRNI is more than 25%.

The following three nutrients met both of these criteria: iron, magnesium and selenium. The contribution of food groups to all nutrients overall and by demographic group is provided in **Annexe Tables 3** (Excel).

A list of all food groups evaluated is provided in **Annexe 4**. Sixteen broad food groups were analysed. Some of these broad food groups were further divided into sub-groups. For example, Cereals and cereal products was divided into:

- Pasta, rice, pizza and other miscellaneous cereals
- White bread
- Wholemeal bread
- Brown, granary and wheatgerm bread
- Other breads
- High fibre breakfast cereals
- Other breakfast cereals
- Biscuits
- Buns, cakes, pastries and fruit pies
- Puddings

We only present sub-groups contributing to >2% of a given nutrient.

The under-reporting of intake described in **Chapter 5** also applies to food groups reported in this chapter. However, the doubly labelled water method cannot tell us what specific foods and drinks are under-reported. It only tells us that under-reporting is likely and that it likely differs by age group and, in young people aged 11 to 15 years, by sex. Results throughout this chapter should be interpreted in light of this limitation.

6.2. Consumers

The percentage of children and young people aged 2 to 15 years who reported consuming food groups on any one of the up to four days of dietary recalls is presented in **Table 44**.

The most commonly reported food groups, consumed by about 50% or more of children and young people, were:

- Fruit (consumed by 80%)
- Pasta, rice, pizza and other miscellaneous cereals (consumed by 77%)

- White bread (consumed by 71%)
- Biscuits (consumed by 68%)
- Vegetables (not raw) (consumed by 65%)
- Crisps and savoury snacks (consumed by 65%)
- Soft drinks, diet (consumed by 55%)
- Chips, fried and roast potatoes and potato products (consumed by 54%)
- Buns, cakes, pastries and fruit pies (consumed by 52%)
- Cheese (consumed by 49%)
- Sandwiches (consumed by 49%)
- High fibre breakfast cereals (consumed by 48%)
- Yogurt, fromage frais and other dairy desserts (consumed by 47%)

Low fat spread, commercial toddler foods and drinks, tea, coffee, lamb, liver, and dairy-free products were all reported by a small percentage of the sample (each consumed by less than 5%).

The frequency of reported consumption of the following food groups significantly *decreased* with age:

- High fibre breakfast cereals
- Whole milk
- Yogurt, fromage frais and other dairy desserts
- White fish coated or fried
- Fruit
- Commercial toddler foods and drinks

The frequency of reported consumption of the following food groups significantly *increased* with age:

- Chicken and turkey dishes
- Burgers and kebabs
- Chocolate confectionery
- Soft drinks, not diet

Table 44. Weighted percentage of food group consumers on any one of the up to four days of dietary recalls, by age and sex, in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		Females			Males		
Food group	**Overall**	2-4	5-10	11-15	2-4	5-10	11-15
Pasta, rice, pizza and other miscellaneous cereals	77%	74%	77%	77%	79%	80%	73%
White bread	71%	77%	71%	69%	74%	69%	72%
Wholemeal bread**	21%	31%	20%	13%	23%	24%	23%
Brown, granary and wheatgerm bread	12%	13%	11%	9%	12%	15%	12%
Other breads	1%	1%	1%	1%	2%	1%	2%
High fibre breakfast cereals***	48%	60%	47%	32%	61%	60%	39%
Other breakfast cereals	39%	43%	44%	32%	40%	41%	36%
Biscuits**	68%	62%	69%	62%	76%	76%	61%
Buns, cakes, pastries and fruit pies	52%	49%	53%	52%	52%	56%	46%
Puddings**	23%	28%	26%	21%	23%	22%	16%
Whole milk***	35%	50%	35%	19%	57%	40%	27%
Semi-skimmed milk	44%	40%	45%	41%	38%	51%	39%
Skimmed milk	8%	7%	7%	6%	9%	9%	8%
1% Milk	2%	1%	4%	1%	3%	2%	2%
Other milk and cream	19%	11%	21%	20%	17%	21%	16%
Cheese*	49%	57%	50%	48%	61%	47%	43%
Yogurt, fromage frais and other dairy desserts***	47%	68%	50%	32%	61%	54%	33%
Eggs and egg dishes	25%	30%	28%	20%	27%	24%	22%
Butter	43%	45%	41%	38%	49%	46%	42%
Low fat spread	4%	6%	6%	5%	5%	3%	3%
Margarine and other cooking fats and oils NOT polyunsaturated	1%	1%	2%	1%	1%	2%	1%
Reduced fat spread	20%	24%	18%	16%	29%	19%	21%
Bacon and ham	15%	15%	15%	14%	16%	14%	18%
Beef, veal and dishes	36%	31%	36%	35%	35%	36%	38%
Lamb and dishes	2%	4%	3%	1%	2%	2%	2%
Pork and dishes	7%	7%	8%	8%	4%	7%	6%
Coated chicken and turkey manufactured	28%	23%	31%	26%	26%	29%	28%
Chicken and turkey dishes**	44%	35%	44%	43%	40%	44%	54%

Liver, products and dishes	1%	1%	1%	0%	0%	1%	0%
Burgers and kebabs***	6%	1%	6%	6%	3%	5%	10%
Sausages	26%	23%	25%	21%	32%	27%	28%
Meat pies and pastries	16%	14%	15%	16%	14%	18%	17%
Other meat and meat products	8%	4%	9%	5%	6%	10%	9%
White fish coated or fried***	19%	24%	24%	10%	24%	21%	15%
Other white fish, shellfish and fish dishes	10%	11%	9%	8%	8%	11%	11%
Oily fish	7%	9%	7%	5%	6%	6%	10%
Salad and other raw vegetables	38%	42%	41%	32%	41%	41%	32%
Vegetables (not raw)**	65%	71%	65%	60%	73%	70%	54%
Chips, fried and roast potatoes and potato products	54%	50%	52%	57%	51%	57%	55%
Other potatoes, potato salads and dishes	32%	27%	35%	28%	35%	38%	28%
Fruit***	80%	93%	84%	69%	92%	84%	66%
Sugars, preserves and sweet spreads	44%	37%	46%	43%	39%	48%	44%
Crisps and savoury snacks*	65%	55%	68%	68%	59%	71%	62%
Sugar confectionery***	28%	29%	36%	22%	22%	33%	20%
Chocolate confectionery**	37%	32%	35%	48%	25%	35%	36%
Fruit juice	41%	38%	41%	39%	44%	44%	38%
Miscellaneous	68%	70%	72%	69%	65%	65%	68%
Tea, coffee and water*	3%	0%	3%	5%	2%	2%	5%
Commercial toddler foods and drinks***	4%	13%	3%	0%	14%	3%	0%
Ice cream*	18%	16%	20%	15%	13%	23%	16%
Nuts and seeds*	14%	20%	12%	12%	23%	15%	10%
Soft drinks, not diet***	38%	20%	34%	53%	26%	33%	54%
Soft drinks, diet	55%	55%	56%	55%	58%	58%	50%
Sandwiches	49%	44%	50%	51%	47%	51%	47%
Other milk and cream Dairy-free*	6%	11%	6%	6%	12%	5%	3%
Cheese Dairy-free	1%	1%	0%	1%	2%	0%	1%
Yogurt, fromage frais and other dairy desserts Dairy-free **	2%	4%	2%	1%	5%	2%	1%
Ice cream Dairy-free	1%	1%	1%	1%	0%	0%	0%

***p<0.001

**p<0.01

*p<0.05

There were several significant differences in the frequency of reported food group consumption by SIMD (**Table 45**).

The frequency of reported consumption of the following food groups was significantly *higher* among children and young people living in the most deprived areas compared to those in the least deprived areas:

- Coated chicken and turkey manufactured

The frequency of reported consumption of the following food groups was significantly *lower* among children and young people living in the most deprived areas compared to those in the least deprived areas:

- Wholemeal bread
- High fibre breakfast cereals
- Biscuits
- Buns, cakes, pastries and fruit pies
- Semi-skimmed milk
- Cheese
- Other white fish, shellfish and fish dishes
- Oily fish
- Salad and other raw vegetables
- Vegetables (not raw)
- Fruit
- Sugar confectionery
- Nuts and seeds

Table 45. Weighted percentage of food group consumers on any one of the up to four days of dietary recalls, by Scottish Index of Multiple Deprivation, in children and young people, aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		Scottish Index of Multiple Deprivation quintile				
	Overall	1st (Most Deprived)	2nd	3rd	4th	5th (Least Deprived)
Pasta, rice, pizza and other miscellaneous cereals*	77%	70%	81%	75%	78%	81%
White bread	71%	71%	71%	69%	72%	73%
Wholemeal bread**	21%	16%	17%	22%	24%	29%
Brown, granary and wheatgerm bread*	12%	8%	15%	10%	15%	11%
Other breads	1%	1%	1%	2%	1%	1%
High fibre breakfast cereals**	48%	40%	40%	51%	51%	59%
Other breakfast cereals	39%	42%	39%	44%	34%	36%
Biscuits**	68%	58%	64%	74%	71%	73%
Buns, cakes, pastries and fruit pies**	52%	38%	49%	55%	58%	60%
Puddings	23%	18%	23%	22%	24%	26%
Whole milk	35%	38%	32%	34%	38%	33%
Semi-skimmed milk*	44%	39%	46%	47%	40%	48%
Skimmed milk	8%	8%	8%	9%	7%	6%
1% Milk*	2%	4%	1%	1%	3%	1%
Other milk and cream	19%	15%	20%	18%	22%	19%
Cheese**	49%	37%	47%	53%	54%	57%
Yogurt, fromage frais and other dairy desserts	47%	41%	46%	52%	49%	48%
Eggs and egg dishes	25%	26%	19%	23%	26%	28%
Butter	43%	38%	41%	44%	47%	45%
Low fat spread	4%	4%	7%	5%	3%	3%
Margarine and other cooking fats and oils NOT polyunsaturated	1%	1%	1%	1%	2%	2%
Reduced fat spread	20%	20%	20%	22%	22%	17%
Bacon and ham	15%	11%	14%	16%	16%	19%
Beef, veal and dishes	36%	35%	36%	37%	35%	35%
Lamb and dishes	2%	4%	2%	2%	2%	2%
Pork and dishes	7%	5%	6%	7%	8%	9%
Coated chicken and turkey manufactured**	28%	32%	33%	30%	21%	23%

Chicken and turkey dishes	44%	40%	46%	50%	44%	42%
Liver, products and dishes	1%	0%	1%	1%	0%	1%
Burgers and kebabs	6%	6%	5%	6%	6%	6%
Sausages	26%	20%	25%	26%	29%	28%
Meat pies and pastries*	16%	15%	20%	15%	18%	11%
Other meat and meat products	8%	6%	6%	10%	8%	9%
White fish coated or fried	19%	15%	19%	18%	19%	23%
Other white fish, shellfish and fish dishes***	10%	5%	8%	12%	9%	16%
Oily fish***	7%	3%	4%	8%	9%	11%
Salad and other raw vegetables***	38%	24%	32%	38%	45%	51%
Vegetables (not raw)***	65%	52%	60%	68%	71%	74%
Chips, fried and roast potatoes and potato products	54%	53%	59%	55%	50%	55%
Other potatoes, potato salads and dishes	32%	28%	32%	36%	34%	33%
Fruit***	80%	67%	76%	84%	85%	86%
Sugars, preserves and sweet spreads*	44%	43%	41%	51%	38%	49%
Crisps and savoury snacks	65%	65%	67%	67%	59%	69%
Sugar confectionery***	28%	20%	26%	25%	32%	36%
Chocolate confectionery	37%	34%	38%	42%	35%	36%
Fruit juice	41%	35%	41%	40%	41%	49%
Miscellaneous	68%	62%	70%	67%	72%	70%
Tea, coffee and water	3%	3%	1%	4%	4%	3%
Commercial toddler foods and drinks*	4%	1%	4%	4%	6%	5%
Ice cream*	18%	12%	14%	18%	24%	22%
Nuts and seeds***	14%	9%	10%	17%	15%	20%
Soft drinks, not diet	38%	41%	42%	42%	38%	31%
Soft drinks, diet	55%	54%	61%	59%	54%	48%
Sandwiches	49%	48%	49%	51%	48%	50%
Other milk and cream Dairy-free	6%	6%	6%	5%	6%	8%
Cheese Dairy-free	1%	1%	0%	0%	1%	0%
Yogurt, fromage frais and other dairy desserts Dairy-free	2%	2%	1%	1%	2%	4%
Ice cream Dairy-free	1%	0%	1%	1%	0%	1%

***p<0.001

**p<0.01

*p<0.05

The mean, median, standard deviation, standard error, 25th percentile (Q1), and 75th percentile (Q3) intake (g/day) of food groups overall and by demographic group are presented in **Annexe Tables 4** (Excel).

6.3. Contribution to Energy

On average, overall, Cereals and Cereal Products contributed 35% of energy intake (**Table 46**). Milk and Milk Products and Meat and Meat Products each contributed 13%.

The contribution of the following food groups to energy significantly *decreased* with age:

- High fibre breakfast cereals
- Biscuits
- Milk and Milk Products
    - Whole milk
    - Cheese
    - Yogurt, fromage frais and other dairy desserts
- Fish and Fish Dishes (females)
- Vegetables (not raw) (males)
- Fruit

The contribution of the following food groups to energy significantly *increased* with age:

- Pasta, rice, pizza and other miscellaneous cereals
- Meat and Meat Products (especially in males)
    - Chicken and turkey dishes
- Sugar, Preserves and Confectionery
    - Sugar confectionery
    - Chocolate confectionery
- Crisps and Savoury Snacks (especially in females)
- Non-alcoholic beverages

Table 46. Weighted mean percentage of energy intake from food groups in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700). 'Of which' does not sum to broad food group (shaded blue) because only sub-groups >2% are shown.

		Females			Males		
Food group	**Overall**	2-4	5-10	11-15	2-4	5-10	11-15
Cereals and Cereal Products	35	33	34	35	34	35	35
of which:							
Pasta, rice, pizza & other miscellaneous cereals*	9.8	7.1	9.8	12.0	7.9	9.3	10.5
White bread	6.6	6.5	6.5	6.9	5.9	6.1	7.6
High fibre breakfast cereals***	3.4	4.8	2.9	2.3	4.8	3.9	2.9
Other breakfast cereals	2.7	3.2	2.7	2.6	2.7	2.4	2.7
Biscuits***	4.7	4.2	4.9	4.1	5.4	5.2	4.1
Buns, cakes, pastries and fruit pies	4.5	3.7	4.1	5.1	4.1	4.7	4.6
Milk and Milk Products***	13	16	13	9	17	14	10
of which:							
Whole milk***	3.2	5.8	2.9	1.3	5.7	3.7	2.4
Semi-skimmed milk	2.4	2.3	2.5	2.0	2.4	3.0	2.1
Cheese***	2	2.6	2.3	1.8	2.7	1.8	1.4
Yogurt, fromage frais and other dairy desserts***	2.1	3.3	2.5	1.3	3.1	2.3	1.3
Meat and Meat Products***	13	10	13	13	11	13	17
of which:							
Beef, veal and dishes	2.9	2.8	2.8	2.8	2.2	2.4	4.2
Chicken and turkey dishes**	3.2	2.2	3.1	3.5	2.6	3.1	4.3
Fish and Fish Dishes***	2	3	3	1	2	2	2
Sandwiches	7	7	8	8	7	7	7
Vegetables, potatoes	7	7	7	8	7	7	7
of which:							
Vegetables (not raw)***	2.6	3.0	2.3	3.1	2.6	2.5	1.9
Chips, fried and roast potatoes & potato products	3.2	2.9	3.1	3.7	2.6	2.8	3.8
Fruit***	5	7	5	3	8	5	3
Sugar, Preserves and Confectionery***	5	4	5	6	3	4	6
of which:							
Sugar confectionery**	1.2	0.8	1.3	1.1	0.6	1.3	1.3
Chocolate confectionery***	2.5	2.1	2.2	3.6	1.3	1.9	3.2
Crisps and Savoury Snacks***	5	3	5	6	4	5	5
Non-alcoholic beverages***	3	3	3	4	3	3	4
Miscellaneous***	2	2	2	2	1	1	2

***p<0.001, **p<0.01, *p<0.05

6.4. Contribution to Nutrients

6.4.1. Free sugars

On average, overall, Cereals and Cereal Products contributed 34% of free sugars (**Table 47**). Non-alcoholic Beverages contributed 21% and Sugar, Preserves & Confectionery contributed 19%. The contribution of High fibre breakfast cereals and Yogurt, fromage frais & other dairy desserts to free sugars significantly *decreased* with age, whereas the contribution of Chocolate confectionery and Soft drinks, not diet significantly *increased*.

Table 47. Weighted mean percentage of free sugars intake from food groups in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700). 'Of which' does not sum to broad food group (shaded blue) because only sub-groups >2% are shown.

		Females			Males		
Food group	**Overall**	2-4	5-10	11-15	2-4	5-10	11-15
Cereals and Cereal Products	34	34	36	30	35	37	33
of which:							
Pasta, rice, pizza & other miscellaneous cereals	3.3	2.2	3.7	3.5	2.5	3.6	3.3
High fibre breakfast cereals***	3.5	5.4	3.4	1.8	5.2	3.6	3.5
Other breakfast cereals	5.7	6.3	5.6	5.5	5.6	5.8	5.3
Biscuits***	9.1	6.7	10.0	7.8	9.8	11.1	7.6
Buns, cakes, pastries and fruit pies	8.3	7.1	8.5	8.4	7.5	8.8	8.2
Milk and Milk Products***	10	13	10	8	13	11	7
of which:							
Other milk and cream	2.2	1.0	2.3	2.8	1.8	2.2	2.4
Yogurt, fromage frais and other dairy desserts***	5.7	9.4	6.0	3.2	9.9	6.3	3.0
Ice cream***	2.2	2.5	1.9	2.1	1.6	2.9	2.1
Meat and Meat Products*	3	2	3	4	3	3	4
Sandwiches	2	2	3	3	3	2	2
Sugar, Preserves and Confectionery***	19	17	20	21	14	19	20
of which:							
Sugars, preserves and sweet spreads	7.3	6.4	7.2	7.3	6.3	7.8	7.8
Sugar confectionery***	4.5	4.9	6.0	3.5	3.2	5.1	3.5
Chocolate confectionery***	7.2	6.0	6.8	10.4	4.1	5.8	8.7
Non-alcoholic beverages*	21	19	18	24	21	19	25
of which:							
Fruit juice	11.2	13.3	10.3	10.7	15.4	10.8	9.8
Soft drinks, not diet***	8.4	2.8	6.3	12.6	4.0	6.5	14.7
Miscellaneous	5	5	5	7	4	4	6

***p<0.001, **p<0.01, *p<0.05

6.4.2. Fibre

On average, overall, Cereals and Cereal Products contributed 38% of fibre (**Table 48**). Vegetables and Potatoes contributed 18% and Fruit contributed 12%. The contribution of High fibre breakfast cereals and Fruit to fibre significantly *decreased* with age, whereas the contribution of Pasta, rice, pizza and other miscellaneous cereals significantly *increased*.

Table 48. Weighted mean percentage of fibre intake from food groups in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700). 'Of which' does not sum to broad food group (shaded blue) because only sub-groups >2% are shown.

		Females			Males		
Food group	**Overall**	2-4	5-10	11-15	2-4	5-10	11-15
Cereals and Cereal Products**	38	37	37	37	38	38	42
of which:							
Pasta, rice, pizza & other miscellaneous cereals**	9.2	6.6	9.4	11.2	7.0	8.3	10.9
White bread	7.5	7.2	7.5	7.8	6.6	6.9	9.0
Wholemeal bread***	3.1	3.8	3.3	1.9	3.2	3.2	3.7
High fibre breakfast cereals***	6.8	8.3	5.9	4.5	9.4	8.1	6.0
Other breakfast cereals	3.1	3.4	3.2	3.1	3.4	2.8	3.4
Biscuits**	3.8	3.5	3.8	3.6	4.1	4.1	3.8
Buns, cakes, pastries and fruit pies	3.0	2.2	2.7	3.5	2.7	3.2	3.3
Meat and Meat Products***	10	7	9	9	8	10	13
of which:							
Beef, veal and dishes	2.5	2.4	2.3	2.5	2.0	2.2	3.7
Coated chicken and turkey manufactured	2.1	1.5	2.4	1.9	1.5	2.5	2.5
Chicken and turkey dishes*	2.3	1.6	2.1	2.4	1.9	2.3	2.9
Sandwiches	8	7	8	9	7	8	8
Vegetables, potatoes	18	17	17	20	17	17	17
of which:							
Vegetables (not raw)**	8.9	10.3	8.4	9.7	10.0	8.9	7.2
Chips, fried & roast potatoes & potato products*	4.8	3.9	4.6	5.8	3.6	4.4	5.8
Other potatoes, potato salads and dishes**	2.3	1.5	2.3	2.4	2.1	2.6	2.5
Fruit***	12	17	13	8	18	13	7
Sugar, Preserves and Confectionery***	2	2	3	3	1	2	3
Crisps and Savoury Snacks***	4	3	5	6	3	4	4
Miscellaneous*	3	3	3	3	2	2	2

***p<0.001, **p<0.01, *p<0.05

6.4.3. Saturated fat

On average, overall, Milk and Milk Products contributed 30% of saturated fat (**Table 49**). Cereals and Cereal Products contributed 26% and Meat and Meat Products contributed 15%. The contribution of Whole milk, Cheese and Yogurt, fromage frais & other dairy desserts to saturated fat significantly *decreased* with age, whereas the contribution of Chocolate confectionery significantly *increased*.

Table 49. Weighted mean percentage of saturated fat intake from food groups in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700). 'Of which' does not sum to broad food group (shaded blue) because only sub-groups >2% are shown.

		Females			Males		
Food group	**Overall**	2-4	5-10	11-15	2-4	5-10	11-15
Cereals and Cereal Products**	26	21	26	29	24	26	27
of which:							
Pasta, rice, pizza & other miscellaneous cereals	8.2	5.5	8.1	10.4	7.0	7.5	8.5
White bread	2.3	2.1	2.3	2.5	1.6	2.2	2.6
Biscuits**	6.0	4.9	6.0	5.5	6.0	7.0	5.8
Buns, cakes, pastries and fruit pies*	5.5	3.8	5.1	6.5	4.5	5.5	6.1
Milk and Milk Products***	30	40	30	23	38	32	27
of which:							
Whole milk***	7.7	14.1	6.8	3.2	12.9	8.6	5.9
Semi-skimmed milk	4.6	4.2	4.5	3.8	4.5	5.6	4.2
Cheese***	6.2	8.4	6.7	5.8	8.4	5.3	4.7
Yogurt, fromage frais and other dairy desserts***	3.6	5.5	4.2	2.1	4.8	4.1	2.4
Eggs and Egg Dishes*	2	3	2	1	2	2	2
Meat and Meat Products***	15	10	15	16	13	16	19
of which:							
Beef, veal and dishes	3.4	3.0	3.3	3.6	2.4	2.9	4.9
Chicken and turkey dishes**	2.7	1.6	2.6	3.0	2.2	2.7	3.3
Sausages	2.8	1.9	2.7	2.7	3.1	3.2	2.8
Meat pies and pastries	2.6	1.8	2.2	2.9	2.1	3.0	2.9
Sandwiches	9	9	9	9	9	8	8
Vegetables, potatoes	4	3	3	5	3	3	4
Sugar, Preserves and Confectionery***	6	4	6	9	3	5	7
of which:							
Chocolate confectionery***	4.9	3.8	4.5	7.5	2.5	3.7	5.8
Crisps and Savoury Snacks***	2	1	2	3	2	2	2

***p<0.001, **p<0.01, *p<0.05

6.4.4. Sodium

On average, overall, Cereals and Cereal Products contributed 32% of sodium (**Table 50**). Meat and Meat Products contributed 18%. The contribution of Whole milk and Cheese to sodium significantly *decreased* with age, whereas the contribution of Chicken and turkey dishes significantly *increased*, especially in males.

Table 50. Weighted mean percentage of sodium intake from food groups in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700). 'Of which' does not sum to broad food group (shaded blue) because only sub-groups >2% are shown.

		Females			Males		
Food group	**Overall**	2-4	5-10	11-15	2-4	5-10	11-15
Cereals and Cereal Products	32	32	31	31	32	31	33
of which:							
Pasta, rice, pizza and other miscellaneous cereals	9.6	7.0	9.7	11.5	8.6	9.0	10.0
White bread	9.0	9.6	8.9	8.9	8.6	8.4	10.2
Wholemeal bread***	2.0	2.8	1.8	1.1	2.1	2.1	2.5
Biscuits***	3.1	3.4	3.2	2.7	4.1	3.4	2.6
Buns, cakes, pastries and fruit pies	3.0	2.8	2.8	3.2	3.1	3.2	2.8
Milk and Milk Products***	11	15	12	9	16	12	9
of which:							
Whole milk***	2.4	4.5	2.2	0.9	4.5	2.7	1.8
Semi-skimmed milk	2.3	2.1	2.4	2.0	2.3	2.8	2.2
Cheese***	3.6	4.5	4.2	3.0	4.9	3.4	2.4
Eggs and Egg Dishes*	2	3	2	1	2	2	1
Meat and Meat Products***	18	14	17	17	15	18	22
of which:							
Beef, veal and dishes	3.1	3.1	3.0	2.9	2.4	2.8	4.3
Coated chicken and turkey manufactured	2.8	2.2	3.0	2.6	2.1	3.0	3.3
Chicken and turkey dishes***	3.9	2.8	3.6	4.0	3.7	3.8	4.9
Sausages	3.0	2.3	2.8	2.6	3.3	3.5	3.0
Fish and Fish Dishes***	3	4	4	2	3	3	3
of which:							
White fish coated or fried***	2.0	2.3	3.1	1.1	2.0	2.3	1.4
Sandwiches	12	11	12	13	11	12	12
Vegetables, potatoes	6	6	6	7	6	6	5
of which:							
Vegetables (not raw)**	3.8	4.1	3.6	4.7	3.8	3.7	2.8
Crisps and Savoury Snacks***	6	4	6	7	5	6	5
Non-alcoholic beverages	2	2	2	2	3	2	2
Miscellaneous**	6	6	6	7	5	5	6

***p<0.001, **p<0.01, *p<0.05

6.4.5. Iron

On average, overall, Cereals and Cereal Products contributed 48% of iron (**Table 51**). Meat and Meat Products contributed 14%. The contribution of High fibre breakfast cereals to iron significantly *decreased* with age, whereas the contribution of Chicken and turkey dishes significantly *increased*.

Table 51. Weighted mean percentage of iron intake from food groups in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700). 'Of which' does not sum to broad food group (shaded blue) because only sub-groups >2% are shown.

		Females			Males		
Food group	**Overall**	2-4	5-10	11-15	2-4	5-10	11-15
Cereals and Cereal Products	48	49	46	45	50	49	48
of which:							
Pasta, rice, pizza & other miscellaneous cereals	8.0	5.7	7.7	10.4	6.7	6.9	9.3
White bread	7.8	7.3	8.0	8.4	6.6	7.2	9.1
Wholemeal bread**	2.2	2.8	2.2	1.4	2.2	2.2	2.6
High fibre breakfast cereals***	10.7	14.7	9.4	6.7	16.0	12.9	8.5
Other breakfast cereals	9.1	9.6	9.7	8.3	9.3	8.9	9.1
Biscuits**	4.2	3.5	4.3	4.0	4.4	4.8	4.0
Buns, cakes, pastries and fruit pies	3.6	3.0	3.3	4.2	3.2	3.9	3.6
Milk and Milk Products***	2	2	2	2	2	2	2
Eggs and Egg Dishes*	2	3	3	2	2	2	2
Meat and Meat Products***	14	11	14	14	12	14	18
of which:							
Beef, veal and dishes	4.2	3.8	4.0	4.6	3.4	3.6	5.8
Chicken and turkey dishes**	3.5	2.5	3.5	3.7	3.3	3.4	4.3
Sandwiches	8	7	8	9	7	8	8
Vegetables, potatoes	9	9	9	11	9	9	8
of which:							
Vegetables (not raw)**	5.2	5.8	5.0	5.7	5.5	5.3	4.0
Chips, fried & roast potatoes & potato products	2.2	1.9	2.2	2.7	1.7	2.0	2.5
Fruit***	4	6	4	3	7	4	3
Sugar, Preserves and Confectionery***	3	2	3	4	1	2	3
Crisps and Savoury Snacks***	3	2	3	3	2	3	3
Non-alcoholic beverages	2	2	1	2	1	2	2
Miscellaneous**	3	3	3	4	2	2	3

***p<0.001, **p<0.01, *p<0.05

6.4.6. Magnesium

On average, overall, Cereals and Cereal Products contributed 29% of magnesium (**Table 52**). Milk and Milk Products contributed 14%, Meat and Meat Products contributed 12%, and Vegetables and Potatoes contributed 11%. The contribution of High fibre breakfast cereals, Whole milk, Yogurt, fromage frais & other dairy desserts and Fruit to magnesium significantly *decreased* with age, whereas the contribution of Chicken and turkey dishes significantly *increased*.

Table 52. Weighted mean percentage of magnesium intake from food groups in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700). 'Of which' does not sum to broad food group (shaded blue) because only sub-groups >2% are shown.

		Females			Males		
Food group	**Overall**	2-4	5-10	11-15	2-4	5-10	11-15
Cereals and Cereal Products	29	28	29	29	28	29	31
of which:							
Pasta, rice, pizza & other miscellaneous cereals*	8.2	5.7	8.4	10.0	6.6	7.5	9.4
White bread	4.7	4.3	4.8	5.0	3.9	4.3	5.6
Wholemeal bread***	2.1	2.7	2.2	1.3	2.0	2.2	2.6
High fibre breakfast cereals***	5.1	6.5	4.5	3.8	6.9	5.9	4.3
Other breakfast cereals	2.1	2.6	2.3	1.9	2.0	1.8	2.2
Biscuits**	3.2	2.7	3.3	3.1	3.5	3.7	2.9
Buns, cakes, pastries and fruit pies	2.4	2.0	2.3	2.8	2.0	2.6	2.5
Milk and Milk Products***	14	16	15	10	17	15	11
of which:							
Whole milk***	3.8	6.4	3.5	1.5	6.4	4.4	2.8
Semi-skimmed milk*	3.9	3.4	4.2	3.3	3.5	4.9	3.5
Yogurt, fromage frais and other dairy desserts***	2.3	3.3	2.6	1.5	3.3	2.5	1.4
Meat and Meat Products***	12	9	11	12	9	11	15
of which:							
Beef, veal and dishes	2.9	2.9	2.8	3.1	2.1	2.4	4.2
Chicken and turkey dishes***	4.0	2.8	3.8	4.1	3.1	3.7	5.6
Fish and Fish Dishes***	2	2	2	1	2	2	2
Sandwiches	7	6	8	8	7	7	7
Vegetables, potatoes	11	11	11	13	11	11	11
of which:							
Vegetables (not raw)**	4.8	5.4	4.5	5.5	5.3	4.8	3.7
Chips, fried & roast potatoes & potato products*	3.8	3.2	3.7	4.6	2.8	3.4	4.7
Fruit***	8	11	8	5	12	8	5
Sugar, Preserves and Confectionery***	3	2	3	4	1	3	4
of which:							

Chocolate confectionery***	2.0	1.6	1.8	3.2	0.9	1.5	2.6
Crisps and Savoury Snacks***	4	3	5	5	3	4	4
Non-alcoholic beverages***	4	3	4	5	4	4	5
of which:							
Fruit juice	2.3	2.3	2.1	2.5	2.6	2.3	2.3
Miscellaneous**	2	2	2	3	2	2	2

***p<0.001, **p<0.01, *p<0.05

6.4.7. Selenium

On average, overall, Cereals and Cereal Products contributed 33% of selenium (**Table 53**). Meat and Meat Products contributed 24% and Milk and Milk Products contributed 12%. The contribution of Whole milk, Yogurt, fromage frais & other dairy desserts and Eggs & Egg Dishes to selenium significantly *decreased* with age, whereas the contribution of Chicken and turkey dishes significantly *increased*.

Table 53. Weighted mean percentage of selenium intake from food groups in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700). 'Of which' does not sum to broad food group (shaded blue) because only sub-groups >2% are shown.

		Females			Males		
Food group	**Overall**	2-4	5-10	11-15	2-4	5-10	11-15
Cereals and Cereal Products	33	31	31	36	32	32	32
of which:							
Pasta, rice, pizza and other miscellaneous cereals	11.9	9.5	11.4	15.3	10.9	11.0	11.8
White bread	6.6	6.5	6.5	7.0	6.0	6.0	7.3
Wholemeal bread***	2.0	2.8	1.7	1.3	1.9	2.1	2.3
High fibre breakfast cereals***	2.4	3.1	2.1	1.8	4.0	2.8	1.8
Biscuits***	2.1	2.1	2.1	1.9	2.3	2.3	1.8
Buns, cakes, pastries and fruit pies	3.8	2.7	3.6	4.5	3.6	4.2	3.5
Milk and Milk Products***	12	14	12	9	15	13	9
of which:							
Whole milk***	2.7	4.8	2.3	1.3	4.5	3.0	1.9
Semi-skimmed milk	2.9	2.6	3.0	2.4	2.9	3.6	2.5
Yogurt, fromage frais and other dairy desserts***	2.7	3.9	3.3	1.7	3.9	3.1	1.6
Eggs and Egg Dishes*	4	7	5	3	5	4	3
Meat and Meat Products***	24	18	23	25	20	24	31
of which:							
Beef, veal and dishes	5.0	4.2	5.0	5.4	3.8	4.5	6.6
Coated chicken and turkey manufactured	3.3	2.6	3.4	3.3	2.3	3.5	4.0
Chicken and turkey dishes***	8.5	5.9	8.2	8.6	7.1	8.1	11.8
Sausages	2.2	1.8	2.1	2.1	2.5	2.8	1.8
Fish and Fish Dishes***	7	9	9	5	7	7	8
of which:							
White fish coated or fried***	4.2	4.6	5.8	2.5	4.3	4.5	3.9
Other white fish, shellfish and fish dishes	2.2	2.6	1.8	1.8	2.1	2.2	2.7
Sandwiches	11	10	12	12	11	11	10
Vegetables, potatoes**	4	5	3	4	4	4	3
of which:							
Vegetables (not raw)**	2.9	3.8	2.5	3.5	3.1	2.9	1.9

***p<0.001, **p<0.01, *p<0.05

6.5. Alcohol consumption

Weighted per capita mean alcohol consumption was 0.02 kcal/day. Alcoholic drink consumption was reported by fewer than five participants (exact number suppressed to prevent identifiability). All other alcohol was from foods, namely, 13 participants who reported consuming brandy butter and fewer than five participants (exact number suppressed to prevent identifiability) who reported consuming mussels in a white wine sauce, pasta with seafood or tiramisu.

6.6. Toddler Milks

Children aged 2 to 3 years were asked about frequency of consumption of toddler milks. Most (91%) reported never consuming these products (**Table 54**).

Table 54. Weighted frequency of consumption of toddler milks in children aged 2 to 3 years living in Scotland, 2024 (unweighted sample size 220).

Every day	3.0% (8)
4-6 times a week	1.3% (<5[2])
2-3 times a week	1.6% (<5[2])
Once a week	0.5% (<5[2])
Less than once a week	1.2% (<5[2])
Never	91% (197)
Not sure	1.8% (<5[2])

[2] Exact number suppressed to prevent identifiability.

6.7. Key messages: Food Groups Contributing to Energy and Nutrients

- The most commonly consumed food groups were Fruit, Pasta, rice, pizza & other miscellaneous cereals, White bread, Biscuits, Vegetables (not raw), and Crisps & savoury snacks.
- Biscuits, Buns, cakes, pastries and fruit pies, Yogurt, fromage frais & other dairy desserts, Chocolate confectionery, Fruit juice, and Soft drinks were major sources of free sugars.
- Pasta, rice, pizza & other miscellaneous cereals, Bread, Sandwiches, Breakfast cereals, Vegetables, and Fruit were major sources of fibre.
- Milk & Milk Products and Meat & Meat Products were major sources of saturated fat.
- Pasta, rice, pizza & other miscellaneous cereals, Bread, Sandwiches, Meat & Meat Products, and Crisps & Savoury Snacks were major sources of sodium.
- Bread and Breakfast cereals were major sources of iron.
- Animal-source foods such as Meat & Meat Products, Fish & Fish Dishes, and Milk & Milk Products were major sources of selenium.

Chapter 7. Discretionary and Additional Foods

7.1. Background

The Scottish Government has consulted on proposed regulations to restrict the promotion of food and drink high in fat, sugar or salt in 2018-2019, 2022 and 2024.[38] The most recent consultation includes proposed detail on the foods that would be subject to restriction. The list of foods includes 'discretionary' foods and drinks: confectionery, sweet biscuits, crisps and savoury snacks, cakes, sweet pastries, sugary drinks, puddings, ice cream and dairy desserts. The consultation also proposes additional categories captured by existing promotional restrictions in England[39]: breakfast cereals, sweetened yogurt and fromage frais, pizza, ready meals, and roast potatoes, chips and similar potato products. Details regarding the specific foods and drinks included in our analysis of discretionary and additional foods are presented in **Annexe 5**.

7.2. Consumers

The percentage of children and young people aged 2 to 15 years who reported consuming discretionary and additional foods on any one of the up to four days of dietary recalls is presented in **Table 55**.

Breakfast cereals were consumed by a majority of children and young people (70%). Crisps & savoury snacks were consumed by 65%, Cakes, pastries & puddings by 61% and Sweet biscuits by 58%. Consumption of Confectionery and Sugar-containing soft drinks increased with age whereas consumption of Yoghurts & dairy desserts decreased with age.

Table 55. Weighted percentage of discretionary and additional food consumers on any one of the up to four days of dietary recalls, by age and sex, in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		Females			Males		
	Overall	2-4	5-10	11-15	2-4	5-10	11-15
Discretionary foods							
Sweet biscuits***	58%	41%	59%	54%	58%	69%	55%
Cakes, pastries & puddings	61%	62%	62%	62%	62%	63%	54%
Crisps & savoury snacks	65%	55%	66%	68%	59%	70%	62%
Confectionery*	50%	42%	53%	58%	38%	52%	46%
Ice creams & ice lollies	22%	23%	25%	17%	17%	28%	18%
Sugar-containing soft drinks***	39%	20%	34%	53%	26%	33%	54%
Additional foods							
Breakfast cereals***	70%	79%	70%	56%	82%	79%	58%
Roast potatoes & chips	55%	51%	53%	59%	51%	57%	56%
Pizza	30%	21%	29%	28%	27%	36%	31%
Yoghurts & dairy desserts***	47%	68%	50%	32%	61%	54%	33%
Ready meals	8%	10%	8%	6%	12%	10%	6%

***p<0.001, **p<0.01, *p<0.05

Consumption of most discretionary and additional foods did not differ significantly by SIMD (**Table 56**). The only exceptions were that children and young people living in the least deprived areas were significantly more like to consume Cakes, pastries & puddings and Ice creams & ice lollies than those living in the most deprived areas.

Table 56. Weighted percentage of discretionary and additional food consumers on any one of the up to four days of dietary recalls, by Scottish Index of Multiple Deprivation, in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		Scottish Index of Multiple Deprivation quintile				
	Overall	1st (Most Deprived)	2nd	3rd	4th	5th (Least Deprived)
Discretionary foods						
Sweet biscuits	58%	49%	58%	60%	62%	61%
Cakes, pastries & puddings***	61%	47%	58%	64%	68%	69%
Crisps & savoury snacks	65%	65%	66%	66%	58%	69%
Confectionery	50%	46%	51%	50%	52%	52%
Ice creams & ice lollies**	22%	15%	17%	23%	28%	28%
Sugar-containing soft drinks	38%	41%	42%	42%	38%	31%
Additional foods						
Breakfast cereals*	70%	67%	64%	74%	66%	76%
Roast potatoes & chips	55%	53%	60%	55%	51%	56%
Pizza	30%	29%	33%	27%	30%	32%
Yoghurts & dairy desserts	47%	41%	46%	52%	49%	48%
Ready meals	8%	10%	9%	7%	9%	5%

***p<0.001, **p<0.01, *p<0.05

The mean, median, standard deviation, standard error, 25th percentile (Q1) and 75th percentile (Q3) intake (g/day) of discretionary and additional food groups overall and by demographic group are presented in **Annexe Tables 5** (Excel).

7.3. Contribution to Energy

On average, overall, discretionary foods contributed 21% of energy and additional foods contributed 16% (**Table 57**). Cakes, pastries & puddings and Breakfast cereals each contributed 6% of energy. The percentage of energy from Crisps & savoury snacks and Confectionery significantly increased with age among females. The percentage of energy from Sugar-containing soft drinks significantly increased with age among both females and males. The percentage of energy from Breakfast cereals and Yoghurts & dairy desserts significantly decreased with age among both females and males.

Table 57. Weighted mean percentage of energy intake from discretionary and additional foods, by age and sex, in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		Females			Males		
Food group	**Overall**	2-4	5-10	11-15	2-4	5-10	11-15
Discretionary foods							
Sweet biscuits***	4%	2%	4%	3%	4%	4%	3%
Cakes, pastries & puddings	6%	5%	5%	6%	5%	6%	5%
Crisps & savoury snacks***	5%	3%	5%	6%	4%	5%	4%
Confectionery***	4%	3%	4%	5%	2%	3%	4%
Ice creams & ice lollies***	1%	1%	1%	1%	1%	1%	1%
Sugar-containing soft drinks***	1%	0%	1%	2%	1%	1%	2%
Total discretionary foods	21%	14%	20%	23%	17%	20%	19%
Additional foods							
Breakfast cereals***	6%	8%	5%	5%	7%	6%	6%
Roast potatoes & chips*	3%	3%	3%	4%	3%	3%	4%
Pizza*	4%	2%	4%	4%	2%	4%	5%
Yoghurts & dairy desserts***	2%	3%	2%	1%	3%	2%	1%
Ready meals	1%	1%	1%	0%	1%	1%	1%
Total additional foods	16%	17%	15%	14%	16%	16%	17%

***p<0.001, *p<0.05

There were small but significant differences in the percentage of energy from discretionary and additional foods by SIMD (**Table 58**). Cakes, pastries & puddings and Ice creams & ice lollies contributed significantly less to energy among those living in the most deprived areas whereas Sugar-containing soft drinks contributed significantly more energy, but the differences between the most and least deprived areas were only 1-2%.

Table 58. Weighted mean percentage of energy intake from discretionary and additional foods, by Scottish Index of Multiple Deprivation, in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		Scottish Index of Multiple Deprivation quintile				
Food group	**Overall**	1st (Most Deprived)	2nd	3rd	4th	5th (Least Deprived)
Discretionary foods						
Sweet biscuits	4%	3%	3%	4%	4%	4%
Cakes, pastries & puddings***	6%	4%	5%	6%	7%	6%
Crisps & savoury snacks	5%	6%	5%	4%	4%	5%
Confectionery	4%	3%	4%	4%	3%	4%
Ice creams & ice lollies**	1%	0%	1%	1%	1%	1%
Sugar-containing soft drinks**	1%	2%	1%	1%	1%	1%
Total discretionary foods	21%	18%	19%	20%	20%	21%
Additional foods						
Breakfast cereals*	6%	6%	5%	7%	6%	6%
Roast potatoes & chips	3%	4%	4%	3%	3%	3%
Pizza	4%	4%	4%	3%	3%	4%
Yoghurts & dairy desserts	2%	2%	2%	2%	2%	2%
Ready meals	1%	1%	1%	1%	0%	0%
Total additional foods	16%	17%	16%	16%	14%	15%

***p<0.001, **p<0.01, *p<0.05

7.4. Contribution to Total Fat

On average, overall, discretionary foods contributed 22% of total fat and additional foods contributed 13% (**Table 59**). Crisps & savoury snacks contributed 7% of fat and Cakes, pastries & puddings 6%. The percentage of fat from Pizza significantly increased with age and the percentage from Breakfast cereals and Yoghurt & dairy desserts significantly decreased with age. The percentage of fat from Crisps & savoury snacks and Confectionery significantly increased with age among females. The percentage of fat from Roast potatoes & chips significantly increased with age among males.

Table 59. Weighted mean percentage of fat intake from discretionary and additional foods in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		Females			Males		
Food group	**Overall**	2-4	5-10	11-15	2-4	5-10	11-15
Discretionary foods							
Sweet biscuits***	4%	3%	4%	4%	4%	5%	4%
Cakes, pastries & puddings	6%	5%	6%	7%	6%	6%	7%
Crisps & savoury snacks***	7%	5%	7%	8%	5%	7%	6%
Confectionery***	4%	3%	4%	6%	2%	4%	5%
Ice creams & ice lollies***	1%	1%	1%	1%	1%	1%	1%
Sugar-containing soft drinks	0%	0%	0%	0%	0%	0%	0%
Total discretionary foods	22%	17%	22%	26%	18%	23%	23%
Additional foods							
Breakfast cereals***	2%	3%	2%	2%	3%	2%	2%
Roast potatoes & chips*	4%	4%	4%	4%	3%	3%	5%
Pizza*	4%	2%	4%	4%	2%	4%	5%
Yoghurts & dairy desserts***	2%	3%	3%	1%	3%	2%	1%
Ready meals	1%	1%	1%	0%	1%	1%	1%
Total additional foods	13%	13%	14%	11%	12%	12%	14%

***p<0.001, *p<0.05

There were small but significant differences in the percentage of fat from discretionary and additional foods by SIMD (**Table 60**). Cakes, pastries & puddings and Breakfast cereals contributed significantly less towards fat among those living in the most deprived areas whereas Crisps & savoury snacks contributed significantly more fat, but the differences between the most and least deprived areas were only 1-2%.

Table 60. Weighted mean percentage of fat intake from discretionary and additional foods, by Scottish Index of Multiple Deprivation, in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		Scottish Index of Multiple Deprivation quintile				
Food group	**Overall**	1st (Most Deprived)	2nd	3rd	4th	5th (Least Deprived)
Discretionary foods						
Sweet biscuits	4%	4%	4%	4%	4%	4%
Cakes, pastries & puddings***	6%	5%	6%	6%	7%	7%
Crisps & savoury snacks*	7%	8%	7%	6%	5%	6%
Confectionery	4%	5%	4%	4%	3%	4%
Ice creams & ice lollies**	1%	1%	1%	1%	1%	1%
Sugar-containing soft drinks	0%	0%	0%	0%	0%	0%
Total discretionary foods	22%	23%	22%	21%	20%	22%
Additional foods						
Breakfast cereals*	2%	2%	2%	3%	2%	3%
Roast potatoes & chips	4%	4%	5%	3%	3%	3%
Pizza	4%	4%	4%	3%	3%	4%
Yoghurts & dairy desserts*	2%	2%	2%	2%	2%	2%
Ready meals	1%	1%	0%	1%	0%	0%
Total additional foods	13%	13%	13%	12%	10%	12%

***p<0.001, **p<0.01, *p<0.05

7.5. Contribution to Saturated Fat

On average, overall, discretionary foods contributed 21% of saturated fat and additional foods contributed 13% (**Table 61**). Cakes, pastries & puddings contributed 7% of saturated fat and Sweet biscuits and Confectionery each contributed 5%. The percentage of saturated fat from Sweet biscuits significantly increased with age. Among females, but not males, the percentage of saturated fat from Crisps & savoury snacks, Confectionery, Ice creams & ice lollies, Roast potatoes & chips, and Pizza significantly increased with age. Likewise, among females, but not males, the percentage of saturated fat from Breakfast cereals and Yoghurts & dairy desserts significantly decreased with age.

Table 61. Weighted mean percentage of saturated fat intake from discretionary and additional foods in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		Females			Males		
Food group	**Overall**	2-4	5-10	11-15	2-4	5-10	11-15
Discretionary foods							
Sweet biscuits***	5%	4%	5%	5%	5%	5%	6%
Cakes, pastries & puddings	7%	5%	6%	7%	8%	6%	6%
Crisps & savoury snacks***	2%	1%	2%	2%	3%	2%	2%
Confectionery***	5%	4%	5%	5%	8%	3%	4%
Ice creams & ice lollies***	2%	1%	2%	2%	2%	1%	2%
Sugar-containing soft drinks	0%	0%	0%	0%	0%	0%	0%
Total discretionary foods	21%	15%	20%	21%	26%	17%	20%
Additional foods							
Breakfast cereals***	2%	3%	2%	2%	2%	3%	2%
Roast potatoes & chips*	2%	1%	1%	2%	2%	1%	1%
Pizza*	4%	2%	4%	4%	5%	2%	4%
Yoghurts & dairy desserts***	4%	5%	4%	4%	2%	5%	4%
Ready meals	1%	1%	1%	1%	1%	1%	1%
Total additional foods	13%	12%	12%	13%	12%	12%	12%

***p<0.001, *p<0.05

There were small but significant differences in the percentage of saturated fat from discretionary and additional foods by SIMD (**Table 62**). Cakes, pastries & puddings, Ice creams & ice lollies, and Yoghurts & dairy desserts contributed significantly less to saturated fat among those living in the most deprived areas, but the differences between the most and least deprived areas were only 1-2%.

Table 62. Weighted mean percentage of saturated fat intake from discretionary and additional foods, by Scottish Index of Multiple Deprivation, in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		Scottish Index of Multiple Deprivation quintile				
Food group	**Overall**	1st (Most Deprived)	2nd	3rd	4th	5th (Least Deprived)
Discretionary foods						
Sweet biscuits	5%	5%	5%	5%	5%	5%
Cakes, pastries & puddings***	7%	5%	7%	7%	8%	7%
Crisps & savoury snacks	2%	3%	2%	2%	2%	2%
Confectionery	5%	6%	6%	6%	4%	5%
Ice creams & ice lollies*	2%	1%	1%	1%	2%	2%
Sugar-containing soft drinks	0%	0%	0%	0%	0%	0%
Total discretionary foods	21%	20%	21%	21%	21%	21%
Additional foods						
Breakfast cereals**	2%	2%	2%	3%	2%	2%
Roast potatoes & chips	2%	2%	2%	1%	1%	1%
Pizza	4%	5%	5%	3%	4%	4%
Yoghurts & dairy desserts*	4%	3%	4%	4%	4%	4%
Ready meals	1%	2%	0%	1%	1%	0%
Total additional foods	13%	14%	13%	12%	12%	11%

***p<0.001, **p<0.01, *p<0.05

7.6. Contribution to Free Sugars

On average, overall, discretionary foods contributed 41% of free sugars and additional foods contributed 17% (**Table 63**). Confectionery contributed 11% and Cakes, pastries & puddings contributed 10% of free sugars. The percentage of free sugars from Sugar-containing soft drinks and Confectionery significantly increased with age among both females and males. The percentage of free sugars from Breakfast cereals and Yoghurts & dairy desserts significantly decreased with age among both females and males.

Table 63. Weighted mean percentage of free sugars intake from discretionary and additional foods in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		Females			Males		
Food group	**Overall**	2-4	5-10	11-15	2-4	5-10	11-15
Discretionary foods							
Sweet biscuits***	9%	7%	10%	8%	9%	11%	7%
Cakes, pastries & puddings	10%	10%	10%	10%	10%	11%	10%
Crisps & savoury snacks*	0%	0%	0%	0%	0%	0%	0%
Confectionery***	11%	9%	12%	14%	7%	10%	12%
Ice creams & ice lollies***	3%	4%	3%	2%	2%	4%	2%
Sugar-containing soft drinks ***	8%	3%	6%	13%	4%	7%	15%
Total discretionary foods	41%	33%	41%	47%	32%	43%	46%
Additional foods							
Breakfast cereals***	9%	12%	9%	7%	11%	9%	9%
Roast potatoes & chips	0%	0%	0%	0%	0%	0%	0%
Pizza	2%	2%	2%	2%	1%	2%	3%
Yoghurts & dairy desserts***	6%	9%	6%	3%	10%	6%	3%
Ready meals*	0%	0%	0%	0%	1%	0%	0%
Total additional foods	17%	23%	17%	12%	23%	17%	15%

***p<0.001, *p<0.05

There were significant differences in the percentage of free sugars from discretionary and additional foods by SIMD (**Table 64**). Cakes, pastries & puddings and Ice creams & ice lollies contributed significantly less to free sugars among those living in the most deprived areas whereas Sugar-containing soft drinks contributed significantly more free sugars (nearly twice that of those living in the least deprived areas).

Table 64. Weighted mean percentage of free sugars intake from discretionary and additional foods, by Scottish Index of Multiple Deprivation, in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

		Scottish Index of Multiple Deprivation quintile				
Food group	**Overall**	1st (Most Deprived)	2nd	3rd	4th	5th (Least Deprived)
Discretionary foods						
Sweet biscuits	9%	8%	8%	8%	9%	10%
Cakes, pastries & puddings***	10%	8%	9%	10%	12%	11%
Crisps & savoury snacks	0%	0%	0%	0%	0%	0%
Confectionery	11%	10%	11%	11%	11%	12%
Ice creams & ice lollies**	3%	2%	2%	3%	4%	4%
Sugar-containing soft drinks *	8%	12%	9%	9%	7%	5%
Total discretionary foods	41%	40%	39%	41%	43%	42%
Additional foods						
Breakfast cereals*	9%	10%	9%	10%	8%	9%
Roast potatoes & chips*	0%	0%	0%	0%	0%	0%
Pizza	2%	2%	2%	2%	2%	2%
Yoghurts & dairy desserts	6%	6%	6%	6%	6%	5%
Ready meals	0%	0%	1%	0%	0%	0%
Total additional foods	17%	18%	18%	18%	16%	16%

***p<0.001, **p<0.01, *p<0.05

7.7. Key messages: Discretionary and Additional Foods

- Breakfast cereals were consumed by a majority of children and young people (70%). Crisps & savoury snacks were consumed by 65%, Cakes, pastries & puddings by 61%, and Sweet biscuits by 58%.
- Consumption of Sugar-containing soft drinks increased with age whereas consumption of Breakfast cereals and Yoghurts & dairy desserts decreased with age.
- Discretionary foods contributed 21% of energy intake and additional foods contributed 16% of energy intake. Cakes, pastries & puddings and Crisps & savoury snacks were the top contributors to discretionary foods whereas Breakfast cereals were the top contributors to additional foods.
- Discretionary foods contributed 41% of free sugars and additional foods contributed 17% of free sugars. The contribution of Sugar-containing soft drinks increased significantly with age, from 3 to 13% among females and 4 to 15% among males. In contrast, the contribution of Yoghurts & dairy desserts significantly decreased with age, from 9 to 3% among females and from 10 to 3% among males.
- The differences in consumption of discretionary and additional foods between children and young people living in the most versus least deprived areas were small, with two exceptions. First, children and young people living in the least deprived areas were significantly more like to consume Cakes, pastries & puddings than those living in the most deprived areas. Second, the percentage contribution of Sugar-containing soft drinks to free sugars among children and young people living in the most deprived areas was more than double that of those living in the least deprived areas (12% versus 5%).

Chapter 8. Food and Drink Behaviours in Secondary School Pupils

The 284 participants who selected 'Yes' to the question, 'Your child may be able to complete the next sections about their food and drink intake themselves. Will they be completing the next section?' were asked the additional questions presented in this chapter. These participants were slightly more likely to be female, to be living in SIMD 5 (Least Deprived) and to be living in a household with 1 child compared to all secondary school pupils in the sample (**Table 65**). Results should be interpreted with these sample differences in mind and may not be generalisable to all secondary school pupils.

Table 65. Comparison of characteristics of secondary school pupils who answered additional questions on purchasing food and drink off school grounds during their lunch break, using food delivery apps and consumption of energy drinks.

	Overall (n=1,700)	**All secondary school pupils** (n=469)	**Secondary school pupils who answered additional questions** (n=284)
Sex			
Female	48% (815)	57% (267)	62% (172)
Male	51% (874)	41% (194)	35% (106)
Prefer not to say	0.6% (11)	1.6% (8)	2.2% (6)
Ethnicity			
White	87% (1,497)	88% (415)	84% (241)
Asian or Asian British	4.6% (79)	4.2% (22)	5.8% (18)
Mixed or multiple ethnic groups	4.4% (73)	4.0% (20)	4.8% (16)
Black, Black British, Caribbean or African	2.6% (28)	3.7% (9)	4.7% (7)
Other	0.7% (11)	0% (0)	0% (0)
Prefer not to say	0.7% (12)	0.6% (<5[1])	0.6% (<5[1])
Scottish Index of Multiple Deprivation quintile			
1st (Most Deprived)	22% (272)	20% (66)	17% (32)
2nd	19% (330)	18% (90)	16% (49)
3rd	18% (347)	19% (100)	19% (61)
4th	21% (380)	21% (103)	21% (64)
5th (Least Deprived)	20% (371)	22% (110)	26% (78)
Number of adults in household			
1	17% (275)	19% (88)	17% (50)
2	75% (1,298)	66% (316)	68% (197)
3 or more	7.7% (127)	15% (65)	14% (37)
Number of children in household			
1	28% (647)	29% (178)	33% (123)
2	48% (791)	47% (218)	46% (128)
3 or more	24% (262)	25% (73)	20% (33)

Values are weighted percentage (unweighted n).
[1] Exact number suppressed to prevent identifiability.

8.1. Food off school grounds

8.1.1. Background

A 2014 survey of young people aged 13 to 15 years conducted in seven schools across five local authorities in Scotland found that 77% of pupils reported buying food or drink beyond the school gate at least twice each week, rising to 90% of pupils in the most deprived schools studied.[40] The top five reasons mentioned by pupils for visiting outlets beyond the school gate in that survey were:

1. Their friends go to that place (89%)
2. It is close to their school (87%)
3. They like the quality (85%)
4. They like the variety (84%)
5. They like the service (74%)

Recognising the need to improve the healthfulness of food consumed beyond the school gate, the Scottish Government published Beyond the School Gate Guidance in 2014 and an Out of Home Action Plan in 2021. However, we were unable to find a survey conducted since 2014 to understand this food behaviour among young people living in Scotland, or a survey that explored the use of food delivery apps by young people, which add further complexity to food environments beyond the school gate.

8.1.2. Frequency of purchasing food or drink off school grounds during school lunch break

About half of participants in secondary school reported purchasing food or drink off school grounds at least once in a usual school week (**Table 66**). Males reported a slightly higher frequency of purchasing food or drink off school grounds than females. This is a much lower percentage of pupils than reported in the aforementioned 2014 survey (77%), likely reflecting differences in the underlying sample rather than a decline in purchasing food or drink off school grounds during school lunch break. Our sample was from across Scotland versus 7 schools[40]; our sample was 62% female versus 53% in the previous survey; and our sample was younger (11- to 15-year-olds versus 13- to 15-year-olds).

Table 66. Frequency of purchasing food or drink off school grounds during school lunch break in a usual school week among young people in secondary school living in Scotland, 2024.

	Overall (n=284)[1]	**Female** (n=172)	**Male** (n=106)
Never	46% (130)	45% (78)	46% (48)
1-2 days a week	35% (97)	40% (66)	28% (30)
3-4 days a week	7% (21)	5% (9)	10% (12)
Every day	9% (27)	7% (14)	12% (12)
Not sure	3% (9)	3% (5)	4% (<5[2])

Values are weighted percentage (unweighted n).
[1] Includes 6 participants who reported 'Prefer not to say' for sex.
[2] Exact number suppressed to prevent identifiability.

8.1.3. Motivations for purchasing food or drink off school grounds during school lunch break

Sixty-five percent of secondary school pupils agreed or strongly agreed that it was their right to choose where they go and buy food. The top motivations for buying food off school grounds were because pupils can't get the food they want in school (60% agree or strongly agree), because their friends do (55% agree or strongly agree), and because the canteen queue is too long (49% agree or strongly agree) (**Table 67**).

Table 67. Motivations for purchasing food or drink off school grounds during school lunch break in a usual school week among young people in secondary school living in Scotland, 2024.

	Overall (n=284)[1]	**Female** (n=172)	**Male** (n=106)
Because it's my right to choose where I go and buy food			
Strongly agree	20% (32)	17% (16)	24% (15)
Agree	45% (72)	46% (48)	41% (23)
Neither agree nor disagree	32% (47)	34% (29)	30% (18)
Disagree	3% (<5[2])	2% (<5[2])	3% (<5[2])
Strongly disagree	1% (<5[2])	0% (0)	1% (<5[2])
Because my friends do			
Strongly agree	15% (20)	19% (14)	9% (6)
Agree	40% (61)	38% (37)	41% (23)
Neither agree nor disagree	20% (33)	20% (20)	20% (12)
Disagree	16% (26)	12% (13)	22% (13)
Strongly disagree	9% (14)	10% (10)	8% (<5[2])
Because I can't get the food I want in school			
Strongly agree	15% (25)	14% (14)	19% (11)
Agree	45% (69)	48% (44)	40% (24)
Neither agree nor disagree	18% (27)	20% (19)	15% (7)
Disagree	16% (24)	13% (12)	20% (12)
Strongly disagree	6% (9)	5% (5)	7% (<5[2])
Because the canteen queue is too long			
Strongly agree	18% (28)	21% (20)	11% (7)
Agree	31% (48)	33% (31)	25% (16)
Neither agree nor disagree	23% (38)	24% (24)	23% (14)
Disagree	19% (28)	13% (12)	31% (16)
Strongly disagree	9% (12)	9% (7)	10% (5)
Because I want to get out of school			
Strongly agree	10% (16)	13% (13)	4% (<5[2])
Agree	37% (57)	37% (33)	35% (22)
Neither agree nor disagree	26% (44)	30% (31)	19% (13)
Disagree	22% (31)	17% (15)	34% (16)
Strongly disagree	5% (6)	4% (2)	8% (<5[2])
Because I don't like school lunches			
Strongly agree	14% (24)	12% (14)	15% (9)
Agree	27% (44)	32% (31)	18% (12)
Neither agree nor disagree	31% (45)	35% (30)	24% (15)
Disagree	21% (30)	17% (16)	28% (14)
Strongly disagree	8% (11)	4% (<5[2])	16% (8)
Because I don't like the canteen			

Strongly agree	9% (16)	7% (9)	12% (7)
Agree	20% (34)	24% (25)	14% (9)
Neither agree nor disagree	29% (44)	36% (32)	18% (12)
Disagree	34% (50)	30% (26)	38% (22)
Strongly disagree	8% (10)	3% (<5[2])	18% (8)

Values are weighted percentage (unweighted n).
[1] Includes 6 participants who reported 'Prefer not to say' for sex.
[2] Exact number suppressed to prevent identifiability.

The above questions captured the majority of motivations of young people for purchasing food or drink off school grounds during school lunch break. Analysis of the 'other' text responses identified ten participants who mentioned that they ate food off the school grounds as a 'treat' every once in a while. All other 'other' text responses had fewer than ten responses.

8.2. Use of food delivery apps

Approximately two-fifths of young people reported ever using a food delivery app (**Table 68**).[6] Most started using food delivery apps when they were 12 years or older. However, the frequency of app use was low. About half reported using food delivery apps less than once a month and only 10% reported using food delivery apps weekly.

Table 68. Use and frequency of use of food delivery apps among young people in secondary school living in Scotland, 2024.

	Overall (n=284)[1]	**Female** (n=172)	**Male** (n=106)
Ever used food delivery app			
Yes	37% (107)	43% (77)	26% (28)
No	66% (177)	57% (95)	74% (78)
Among those who have ever used a food delivery app:			
Age first used food delivery app			
9y	1% (<5[2])	1% (<5[2])	0% (0)
10y	6% (6)	7% (5)	3% (<5[2])
11y	5% (5)	7% (5)	0% (0)
12y	28% (31)	30% (22)	24% (9)
13y	26% (28)	21% (18)	37% (9)
14y	25% (27)	26% (21)	26% (6)
15y	8% (8)	8% (5)	10% (<5[2])
Frequency of food delivery app use			
Less than once a month	52% (56)	52% (41)	53% (15)
About once a month	25% (26)	28% (21)	19% (5)
About 2-3 times a month	13% (12)	11% (7)	21% (5)
About once a week	9% (12)	9% (8)	5% (<5[2])
Several times a week	1% (<5[2])	0% (0)	2% (<5[2])

Values are weighted percentage (unweighted n).
[1] Includes 6 participants who reported 'Prefer not to say' for sex.
[2] Exact number suppressed to prevent identifiability.

[6] The terms and conditions of some food delivery services specify that individuals using the service must be 18 years or older.

8.3. Consumption of energy drinks

8.3.1. Background

The Scottish Government defines energy drinks as any drink containing over 150 mg of caffeine per litre, excluding teas and coffee.[41] Energy drinks have been found to have negative physical and mental health effects in children and young people.[42] Energy drinks have not been allowed in schools since 2008.[43] In 2023, the Scottish Government published an analysis of a consultation on ending the sale of energy drinks to children and young people.[44] An overwhelming majority of respondents (85%) thought there should be a ban on sales of energy drinks to young people.[44]

The Health Behaviour in School-aged Children (HBSC) is a nationally representative survey of 11-, 13- and 15-year-olds. The latest HBSC survey in Scotland (2022, n=4,388 pupils) found that 9% of participants reported consuming energy drinks daily with no difference by gender.[45] Consumption increased with age (6% of 11-year-olds reported consuming energy drinks daily versus 11% of 15-year-olds).

8.3.2. Frequency of drinking energy drinks

The majority of young people reported never drinking energy drinks (**Table 69**). Females were more likely to drink energy drinks than males (30% ever consume versus 21% of males). Given the relatively small sample size and the observation that participants who answered these questions were slightly more likely to be female, to be living in SIMD 5 (Least Deprived) and to be living in a household with 1 child compared to all secondary school pupils in the sample (**Table 65**), these results should be interpreted with caution.

Table 69. Frequency of drinking energy drinks among young people in secondary school living in Scotland, 2024.

	Overall (n=284)[1]	**Female** (n=172)	**Male** (n=106)
Never	74% (211)	70% (119)	79% (87)
Less than once a week	17% (44)	17% (29)	16% (14)
1-2 days a week	4% (15)	6% (12)	2% (<5[2])
3-4 days a week	1% (<5[2])	2% (<5[2])	0% (0)
5-6 days a week	3% (5)	3% (<5[2])	2% (<5[2])
Every day	1% (<5[2])	1% (<5[2])	0% (0)
Not sure	1% (<5[2])	1% (<5[2])	0% (0)

Values are weighted percentage (unweighted n).
[1] Includes 6 participants who reported 'Prefer not to say' for sex.
[2] Exact number suppressed to prevent identifiability.

8.3.3. Motivations for drinking energy drinks

The top motivation for drinking energy drinks was taste (69% thought this was extremely or very important), followed by 'to boost energy' (29%) (**Table 70**). To study better, peer effects, and cost were not considered important by the majority of young people who drank energy drinks.

Table 70. Motivations for drinking energy drinks among young people in secondary school living in Scotland, 2024.

	Overall (n=284)[1]	**Female** (n=172)	**Male** (n=106)
The taste			
Extremely important	23% (14)	23% (9)	23% (5)
Very important	46% (33)	47% (24)	42% (8)
Somewhat important	15% (10)	17% (8)	11% (<5[2])
Slightly important	11% (9)	10% (7)	16% (<5[2])
Not important	5% (<5[2])	4% (<5[2])	8% (<5[2])
To not feel tired or sleepy / For an energy boost			
Extremely important	8% (<5[2])	8% (<5[2])	8% (<5[2])
Very important	21% (18)	24% (14)	15% (<5[2])
Somewhat important	26% (18)	24% (13)	32% (5)
Slightly important	24% (17)	21% (10)	28% (6)
Not important	21% (13)	23% (10)	17% (<5[2])
To study better			
Extremely important	2% (<5[2])	0% (0)	8% (<5[2])
Very important	10% (6)	15% (6)	0% (0)
Somewhat important	19% (14)	23% (11)	10% (<5[2])
Slightly important	12% (9)	13% (7)	10% (<5[2])
Not important	57% (40)	49% (26)	73% (13)
Because my friends drink them			
Extremely important	3% (<5[2])	4% (<5[2])	0% (0)
Very important	4% (<5[2])	6% (<5[2])	0% (0)
Somewhat important	11% (8)	14% (7)	4% (<5[2])
Slightly important	19% (12)	19% (8)	21% (<5[2])
Not important	63% (45)	57% (30)	75% (14)
Because they cost less than other drinks			
Extremely important	5% (<5[2])	7% (<5[2])	0% (0)
Very important	8% (6)	5% (<5[2])	18% (<5[2])
Somewhat important	24% (15)	25% (11)	20% (<5[2])
Slightly important	6% (<5[2])	4% (<5[2])	12% (<5[2])
Not important	56% (42)	60% (32)	51% (10)

Values are weighted percentage (unweighted n).
[1] Includes 6 participants who reported 'Prefer not to say' for sex.
[2] Exact number suppressed to prevent identifiability.

Generally, the above questions captured the motivations of young people for drinking energy drinks. Analysis of the 'other' text responses identified five participants who mentioned sport performance as a motivation. All other 'other' text responses had fewer than five responses.

Chapter 9. Food Insecurity

9.1. Background

In 2023, the Scottish Government published a plan, 'Cash-First - towards ending the need for food banks in Scotland', which outlines nine actions over the years 2023 to 2026 to reduce the need for emergency food parcels.[46] Food insecurity is monitored and reported by SHeS. The latest data on food insecurity, from SHeS 2023, shows that a lack of money or other resources in the previous 12 months resulted in 14% of adults worrying about running out of food, 11% eating less and 6% running out of food.[2] Single parents report the highest levels of food insecurity of any demographic group: in SHeS 2019/21 (values not reported in 2023), 34% of single parents worried about running out of food, 23% ate less and 12% ran out of food.[47] We evaluated food insecurity in the DISH survey using the three questions from SHeS as well as a fourth question that asked specifically about eating less to leave more for your child/children.

9.2. Food insecurity

Overall, 22% of parents/guardians reported worrying about running out of food in the previous 12 months, 17% had smaller meals than usual or skipped meals, 7% ran out of food and 7% ate less to leave more for their child/children (**Table 71**). There was not a significant difference in food insecurity by age and sex.

Table 71. Weighted percentage of household food insecurity, by age and sex, in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700). [1]

In the previous 12 months…	Overall	Females			Males		
		2-4	5-10	11-15	2-4	5-10	11-15
Worried about running out of food	22% (330)	21% (36)	24% (61)	19% (56)	24% (48)	20% (72)	25% (54)
Had smaller meals than usual or skipped meals	17% (257)	15% (26)	17% (42)	15% (46)	21% (42)	15% (51)	23% (47)
Ran out of food	7% (95)	3% (<5[2])	6% (14)	8% (23)	8% (14)	5% (15)	11% (24)
Ate less to leave more for your child/children	7% (94)	3% (<5[2])	6% (14)	8% (23)	8% (14)	5% (15)	11% (23)

Values are weighted percentage (unweighted n).

[1] Only those who responded 'Yes' were asked subsequent questions. For example, only those who responded 'Yes' to being worried about running out of food were asked if they had smaller meals than usual or skipped meals.

[2] Exact number suppressed to prevent identifiability.

Parents/guardians living in the most deprived areas were significantly more likely to report all food insecurity indicators compared to those living in the least deprived areas (**Table 72**).

Table 72. Weighted percentage of household food insecurity, by Scottish Index of Multiple Deprivation, in children and young people aged 2 to 15 years living in Scotland who completed at least one dietary recall, 2024 (unweighted sample size 1,700).

In the previous 12 months…	**Overall**	**Scottish Index of Multiple Deprivation quintile**				
		1st (Most Deprived)	2nd	3rd	4th	5th (Least Deprived)
Worried about running out of food***	22% (330)	44% (114)	30% (91)	16% (58)	13% (48)	6% (19)
Had smaller meals than usual or skipped meals***	17% (257)	38% (98)	21% (67)	14% (47)	9% (32)	4% (13)
Ran out of food***	7% (95)	17% (44)	8% (26)	3% (10)	3% (12)	1% (<5[1])
Ate less to leave more for your child / children*	7% (94)	17% (44)	8% (25)	3% (10)	3% (12)	1% (<5[1])

Values are weighted percentage (unweighted n).

***p<0.001, *p<0.05

[1] Exact number suppressed to prevent identifiability.

Chapter 10. Discussion

Findings of this representative survey of children and young people aged 2 to 15 years living in Scotland confirm that poor diets continue to be a significant public health challenge, especially for young people 11 to 15 years. Specifically, diets are too energy dense, too high in salt, saturated fat, and free sugars, and too low in fibre, fruit and vegetables, and oily fish. Forthcoming restrictions on the advertising of HFSS products and 9pm TV and on-demand programme services watershed for advertising HFSS products aim to address poor diets, alongside wider action to improve the food environment outlined within the Diet and Healthy Weight Delivery Plan and Out of Home Action Plan. However, continued monitoring of diets in children and young people is needed to assess the impact of policy interventions on diet, particularly salt, saturated fat, free sugars and overall energy density. Moreover, further measures are needed to increase intake of health-promoting nutrients and foods, particularly fibre, and fruit and vegetables.

Overall, intake of protein and micro-nutrients was at or above the RNI except for zinc, which was below the RNI. However, in females 11 to 15 years old, vitamin A, folate, iron, calcium, magnesium, potassium, iodine and selenium intake were below the RNI. Likewise, in males 11 to 15 years old, vitamin A, iron, calcium, magnesium, potassium and selenium intake were below the RNI. The percentage of participants below the LRNI was less than 10% for all nutrients in 2- to 4-year-olds and 5- to 10-year-olds. However, this percentage was at or above 10% in 11- to 15-year-olds for vitamin A, riboflavin, iron, calcium, magnesium, potassium, iodine, selenium and zinc.

Overall, a lack of money or other resources in the previous 12 months resulted in 22% of parents/guardians reporting being worried about running out of food, 17% eating less, 7% running out of food and 7% eating less to leave more for their child/children. These values are higher than those reported by all adults in SHeS 2023, wherein 14% of adults reported worrying about running out of food, 11% ate less and 6% ran out of food. Moreover, in the DISH survey, there were significant differences in food insecurity by quintile of SIMD. Nearly half (44%) of parents/guardians living in the most deprived areas reported worrying about running out of food in the previous 12 months versus 6% of those in the least deprived areas. Nearly one-fifth (17%) of parents/guardians living in the most deprived areas reported running out of food in the previous 12 months versus 1% of those in the least deprived areas.

Comparison to other diet surveys

While no surveys are available for direct comparison to the DISH survey, several representative surveys using different dietary assessment methodologies and different sample populations are worth mentioning:

- The most recent published NDNS data (Years 9-11, 2016/17-2018/19, covering children and young people aged 1.5 to 18 years living in the UK) which used up to four un-weighed food diaries to assess dietary intake
- A food frequency questionnaire administered to children and young people living in Scotland aged 3 to 16 years in 2010
- SHeS 2021 in adults 16+ years which used Intake24 to assess dietary intake

Dietary intake was generally similar between the DISH survey and the most recent published NDNS data (**Table 73**). Energy and protein intake were slightly higher in DISH than NDNS, though these may reflect differences in mis-reporting rather than true differences in intake. Moreover, children aged 2 to 4 years tended to have higher intakes of some nutrients such as vitamin A, folate, iron and magnesium in DISH compared to NDNS but this was not true for all nutrients (e.g., riboflavin, vitamin D and calcium were very similar between the two samples and iodine, selenium and zinc were lower in DISH than NDNS). These differences may reflect differences in the age groups between DISH and NDNS given that the RNIs for most nutrients evaluated go up at 4 years of age and DISH includes 4-year-olds in the youngest age group whereas NDNS includes them in the middle age group.

Table 73. Mean intakes of children and young people in Scotland (DISH 2024) versus the UK (NDNS 2016/17-2018/19). Caution should be taken in directly comparing values because these surveys used different dietary assessment tools (up to four 24-hour dietary recalls in DISH and up to four food diaries in NDNS).[1]

Nutrient[2]	**DISH**			**NDNS**		
	2-4y	5-10y	11-15y	1.5-3y	4-10y	11-18y
Energy, kcal/day	1,281	1,600	1,734	1,056	1,442	1,659
Protein, g/day	49	61	66	41.0	52.9	64.5
Vitamin A, % RNI	123%	106%	88%	115%	121%	90%
Riboflavin, % RNI	214%	166%	124%	216%	148%	115%
Folate, % RNI	224%	153%	100%	192%	137%	115%
Vitamin D, µg/day	2	2	2	2.4	2.3	2.2
Iron, % RNI	117%	118%	76%	84%	107%	72%
Calcium, % RNI	208%	172%	93%	202%	145%	83%
Magnesium, % RNI	189%	124%	77%	172%	117%	73%
Potassium, % RNI	217%	140%	74%	207%	137%	68%
Iodine, % RNI	115%	138%	101%	180%	138%	87%
Selenium, % RNI	133%	132%	78%	155%	123%	75%
Zinc, % RNI	83%	99%	83%	96%	87%	84%

[1] The DISH survey age groups differ slightly from NDNS and so comparisons were made to the closest age group: 2-4y in DISH to 1.5-3y in NDNS, 5-10y in DISH to 4-10y in NDNS, and 11-15y in DISH to 11-18y in NDNS.

[2] Vitamin B_{12} and vitamin C intake not shown because these vitamins are not included in the most recent published NDNS report (Years 9-11, 2016/17-2018/19), though data are available on the UK Data Archive.

The most recent representative information on diets of children and young people for a similar age range in Scotland using a validated tool is from 2010.[10] However, results from that survey are not directly comparable to the DISH survey because different dietary assessment tools were used. The 2010 survey used a food frequency questionnaire. Moreover, it covered a slightly older age group (3 to 16 years). It can be used to consider a comparison for select nutrients reported in both surveys,[7] but should not be interpreted as trends in dietary intake. Reported saturated fat intake is similar between the 2010 survey and DISH, sugar and calcium intake are lower in DISH and iron intake is higher (**Table 74**).

[7] Energy density, fibre and salt were not included in the 2010 report. Calcium and iron were the only micro-nutrients reported in the 2010 report.

In 2010, the main contributors to sugar intake were non-diet soft drinks (16%), confectionery (13%), biscuits, cakes & pastries (12%), yoghurt & fromage frais (7%) and fruit juice (6%).

Table 74. Mean intakes of children and young people in Scotland 2010 to 2024. Caution should be taken in directly comparing values because these surveys used different dietary assessment tools (a food frequency questionnaire in 2010 and up to four 24-hour dietary recalls in 2024).

	2010 (3-16y)	2024 (2-15y)
Saturated fat, % of energy	13.2%	13%
Non-milk extrinsic sugars (2010) or free sugars (2024), % of energy	15.6%	11%
Calcium, mg/day	950	845
Iron, mg/day	8.6	9.0

The diets of adults (16+ years) living in Scotland were assessed as part of the SHeS in 2021. Results are compared to intake of these food groups and sub-groups among adults 16+ years in SHeS 2021, which were reported by FSS in 2023.[48] Results are more directly comparable because both SHeS and DISH used Intake24 to assess dietary intake.

Children and young people were much more likely to consume all discretionary and additional food sub-groups than adults (**Table 75**). However, the differences in terms of percentage contribution to energy, saturated fat and free sugars were less pronounced. Cakes, pastries and puddings, Crisps and savoury snacks, and Pizza contributed a higher percentage of energy among children and young people than adults, but the differences were small (2%). Breakfast cereals and Yoghurts and dairy desserts contributed a higher percentage of free sugars among children and young people than adults, with differences being slightly higher than observed for energy or saturated fat (e.g., 3-4%).

Results by SIMD were similar between children and young people and adults, with consumption patterns for discretionary and additional foods not differing substantively by SIMD with the exception of Sugar-containing soft drinks which contributed more to free sugars than among those living in the least deprived areas.

Table 75. Comparison of intakes of discretionary and additional foods among children and young people aged 2 to 15 years living in Scotland (DISH 2024) versus adults 16+ years (SHeS 2021).

	% Consumers		% Energy		% Saturated fat		% Free sugars	
	2-15	16+	2-15	16+	2-15	16+	2-15	16+
Discretionary foods								
Sweet biscuits	58%	46%	4%	4%	5%	6%	9%	10%
Cakes, pastries & puddings	61%	39%	6%	4%	7%	5%	10%	8%
Crisps & savoury snacks	65%	33%	5%	3%	2%	1%	0%	0%
Confectionery	50%	31%	4%	3%	5%	5%	11%	9%
Ice creams & ice lollies	22%	14%	1%	1%	2%	2%	3%	3%
Sugar-containing soft drinks	39%	26%	1%	1%	0%	0%	8%	9%
Additional foods								
Breakfast cereals	70%	54%	6%	5%	2%	2%	9%	5%
Roast potatoes & chips	55%	33%	3%	2%	2%	1%	0%	0%
Pizza	30%	11%	4%	2%	4%	3%	2%	1%
Yoghurts & dairy desserts	47%	29%	2%	2%	4%	3%	6%	3%
Ready meals	8%	6%	1%	1%	1%	2%	0%	1%

Key limitations

One of the most substantial limitations of the DISH survey and other diet surveys such as SHeS and NDNS is under-reporting. A method called doubly labelled water is a tool used to assess the degree of under-reporting in diet surveys. Doubly labelled water was not used in the DISH survey. However, the most recent doubly labelled water sub-study of NDNS (2019/20 and 2020/22) found that energy intake reported using Intake24 was, on average, 20% lower than doubly labelled water in children aged 4 to 10 years, with little difference by sex.[35] In young people aged 11 to 15 years, energy intake was under-reported using Intake24 by 32% in males and 26% in females.[35] While this method cannot tell us what specific foods and drinks are under-reported, it does suggest that under-reporting is likely and could be quite substantial.

The underlying nutrient database for Intake24 is not brand-specific for most items and does not reflect food and drink industry formulations for 2024. This will likely result in mis-measurement of nutrients, especially for packaged and out of home foods.

The response rate was 8.8%, which is substantially lower than the response rate to the 2010 survey of diets in children and young people in Scotland (55%). This likely reflects differences in methodology, notably that there was no face-to-face interview for the DISH survey, whereas the previous survey involved a face-to-face recruitment and interview. Sample weighting ensured that the DISH survey sample was representative of the Scottish population with regards to sex, age and SIMD, but we cannot rule out a lack of representativeness for other population characteristics.

Recommendations

- Diets of children and young people aged 2 to 15 years should be monitored using Intake24 together with adults 16+ years in future rounds of SHeS.
- Ongoing diet surveys in Scotland would benefit from inclusion of nutritional biomarkers. For example, in advance of folic acid fortification legislation, folate measurement will be vital to understand the impact.
- 24h-urinary sodium surveys would also be appropriate to consider to better understand and monitor salt intake.
- It would be useful for the Scottish Dietary Goals to include modified portion sizes for children for fruit and vegetables and red and red processed meat.
- It would be informative to consider an update for some comparisons once more recent NDNS data are available, as the data are more commensurate in terms of time and methods (Intake24).
- Further measures are needed to reduce intake of free sugars, saturated fat and salt. These measures should focus on discretionary and additional foods, as well as meat and meat products, which were major sources of these nutrients in the diets of children and young people in Scotland.
- Measures are needed to increase intake of fibre. These measures should focus on bread, breakfast cereals, pasta, rice, vegetables including beans, and fruit.
- The above-mentioned changes may also reduce the energy density of diets which would be beneficial for preventing weight gain in children and young people.
- Further measures are needed to address food insecurity for households with children and young people, particularly those in the most deprived areas of Scotland.

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Annexe 1. Invitation Letter

[DATE]

Dear Parent or Guardian

We are inviting you and your child to take part in a survey of what children in Scotland are eating and drinking. The study is funded by Food Standards Scotland and led by the University of Edinburgh. A market research company based in Glasgow called Taylor McKenzie is conducting the survey. Researchers at the University of Aberdeen and Biomathematics and Statistics Scotland are also helping with the study.

Your address is one of around 20,000 randomly selected from the Royal Mail's Postcode Address File, confirmed to have an eligible child or young person through a database of everyone registered with a Scottish GP. If more than one child lives here, we will randomly choose one child to participate when you begin the survey.

If you and your child agree to take part, we would like you to visit our survey, using your unique link or QR code, provided below. You will be asked to complete a short questionnaire and a food diary of all the food and drinks **your child** had on the **previous day**. We would like you to complete up to 4 food diaries **within 2 weeks** of completing the first one. If your child is in secondary school, we suggest they complete the food diaries themselves with some help from you if needed.

As a token of our appreciation, you will receive a **£10 gift voucher** upon completion of one food diary, or a **£20 voucher** if you complete two. If you complete four, you can additionally enter a raffle for a chance to win **one of three £100 vouchers**.

Your unique survey link is: «FINAL_LINK» **Your QR code is:**

To complete via **Zoom** or **face-to-face**, contact Taylor McKenzie, at **Intake24@taylormckenzie.co.uk** or 0141 221 8030.

Please read the enclosed participant information sheet before deciding to take part. You can also find some FAQs on our study website (**www.edin.ac/intake24**).

Thank you for considering taking part in this survey.

Annexe 2. Participant Information Sheets

Food Standards Scotland
For safe food and healthy eating

DISH Study
Information Sheet for Parents and Guardians

THE UNIVERSITY of EDINBURGH

You and your child are invited to take part in a study about what children and young people in Scotland aged 2-15 years are eating and drinking. The study is funded by Food Standards Scotland and led by the University of Edinburgh. A market research company based in Glasgow called Taylor McKenzie is conducting the survey. Researchers at the University of Aberdeen and Biomathematics & Statistics Scotland are also helping with the study. The Human Ethical Review Committee at the University of Edinburgh has reviewed and approved this study.

What will happen if I, and my child, decide to take part?

- You will complete a brief questionnaire about your child, including details like their gender and ethnicity, and your household such as the number of adults and children living there.
- You will be asked to complete an online food diary, recording all the food and drink items your child had on the previous day.
  - For secondary school pupils, we suggest they complete this themselves, with your help if needed. Additional questions about their food and drink choices will also be asked.
- Ideally, you or your child will complete up to four food diaries on different days within two weeks of completing the first one.
- We will ask for your email address and/or mobile phone number, which will be held securely by Taylor McKenzie and used solely for study-related communication.
- If you have more than one child, we will randomly select one to participate when you start the questionnaire. You will only be asked to enter information about that child. However, you can choose to include your other children in later surveys when prompted if you wish.
- We will ask if you're interested in taking part in future studies about your child's eating habits. Among those interested with a child aged 3 years or over, 400 will be randomly invited to complete another survey about how often their child had particular food and drink items over the past 2-3 months, from a list of about 145 items.

Time commitment

The initial questionnaire should take about 10 minutes to finish. Each food diary should take around 15 minutes. You will likely get faster after the first one as you get used to the tool. The extra survey about your child's eating habits in the past 2-3 months will take about 20 minutes to complete.

DISH

Opt-out of receiving letters from us

If we do not hear from you, we may send reminder letters to this address.
To opt out of receiving future letters from us, please contact us at:

Intake24@taylormckenzie.co.uk 0808 175 6942

Cost, reimbursement and compensation

Your participation in this study is voluntary. In return for your participation, you will receive a **£10 gift voucher** if you complete one food diary, or a **£20 voucher** if you complete two. If you complete four, you can additionally enter a raffle for a chance to win **one of three £100 vouchers**. If you complete the additional survey about your child's eating habits over the past 2-3 months, you will receive an **additional £10 voucher**.

What if I change my mind?

If you or your child choose to take part but later decide to stop being part of the study, you/they can tell the research team at any time, without giving a reason. Unless you contact us on the email or phone number provided, the data you have provided until that point will be used. If you would like us to stop using your data, please contact us before the study report is published, which is likely to be toward the end of 2024. Unless you indicate that you do not want to receive the study results, we will send the overall findings to you when the study has been completed.

Benefits and risks

There are no known benefits or risks for you or your child from taking part in this study. Choosing not to take part, or stopping the study, will not impact any benefits and other services you and your child are entitled to.

My data

Taylor McKenzie will conduct the survey and have access to all the information you provide. This will be held securely on their server, locked in a secure office. Access to these data is password-protected and only shared with those who require access in order to conduct this study. Researchers at the University of Edinburgh and Biomathematics & Statistics Scotland will have access to your survey responses but this dataset will not contain your child's name, email, address, or phone number. Researchers at the University of Aberdeen will have access to some dietary data but will not have access to any other data.

Taylor McKenzie will retain your child's name, email, address, and phone number for 6 months after which it will be permanently deleted. After that, an anonymous dataset with your child's gender, age, stage of education, receipt of food parcels or vouchers in the school holidays, how many adults and children live in the household, food insecurity, and dietary data will be retained indefinitely in the UK Data Archive.

Confidentiality / anonymity

All the information we collect during the research will be kept confidential. We will use the results from this study in reports, but these will not contain any information that could identify you or your child.

For further information and FAQs visit:
www.edin.ac/intake24

Please see our privacy notice: https://www.foodstandards.gov.scot/intake24/privacynotice

DISH Study

Information for Children and Young People

What is this study for?

To find out what children and young people in Scotland are eating and drinking.

Why have I been asked to take part?

We have sent invitations to around 20,000 children and young people in Scotland. It would take too long and cost too much money to invite every young person in Scotland to take part. Instead, we randomly chose a small number of addresses, which included yours!

Do I have to take part?

No, not if you don't want to. If you aren't yet in secondary school (or high school/academy), your parent or guardian will answer the questions with your help. If you don't want them to complete the survey for you, you can tell them not to. You can also start the survey and then change your mind.

What will I have to do if I take part?

You will be asked to complete an online food diary with all the food and drink you had on the previous day. You will be asked to do up to four of these food diaries. Each one should take around 15 minutes to finish, though you will probably get faster after the first one as you get used to the tool. We will also ask you some additional questions about your food and drink choices.

Who will see my answers?

The team at Taylor McKenzie will see your answers but they will not tell anyone about the answers you give. Researchers at the University of Edinburgh, the University of Aberdeen and Biomathematics & Statistics Scotland will also be able to see everyone's answers but they won't know which answers were yours.

Food Standards Scotland
For safe food and healthy eating

Any questions?
Email us at **Intake24@ed.ac.uk** or visit our study website:
www.edin.ac/intake24

THE UNIVERSITY of EDINBURGH

Annexe 3. Survey

Informed Consent

[Participant logs in to the website using their survey ID]

Thank you for your interest in taking part in our new study of what children in Scotland are eating and drinking.

We just want to check that you've read the information sheet [hyperlink to information sheet] that was sent with your invitation letter?"

[*Yes, I have*]
[*No I haven't*]

If [*Yes, I have*]

- I confirm that I have read the invitation letter and information sheet for this study and have had the opportunity to consider the information and ask questions.
- I understand that my, and my child's, participation is voluntary and that I am free to withdraw myself and my child at any time without giving any reason with no consequence.
- I understand that my, and my child's, name will not appear in any published document relating to this study.

By continuing, you are agreeing to the above statements and have given informed consent. Press next to continue.

[*Continue*] – Directs participants to the start of the online survey

If [*No, I haven't*]

Please read the information sheet [hyperlink to information sheet] before deciding whether or not to take part in this study.

You should have received a copy with your invitation letter or you can read it here [hyperlink to information sheet]

[*I can now confirm that I have read the information sheet and I wish to continue]* – Drops down the same consent information above if they had clicked [Yes, I have]
[*I do not wish to continue (this will close the survey when you press next*] - Blank screen with [Back or Submit]

Parent / Guardian Survey

IMPORTANT - Please read carefully

For this study to be a success, we would like you to complete a minimum of 2 food diaries, of all the food and drinks had **on the previous day** by **your child**. If your child is in secondary school, they may be able to complete these surveys themselves.

When you complete this initial survey you will automatically be directed to the first food diary. Your second food diary will be ready for completion two days after you have completed your first. We will use the details you provide later in the survey to send you a link to this **via email** or text message.

While 2 is the minimum number of food diaries we would like you to complete, we would really appreciate it if you would complete 4 food diaries over a two week period.

For completing 1 full food diary you will receive a £10 gift voucher.
If you complete 2 or more food diaries then you will receive a £20 gift voucher.
If you complete 4 food diaries, you can additionally enter a raffle for a chance to win one of three £100 gift vouchers.

No.	QUESTION	OPTIONS
1	How many children do you have in your household aged between 2 and 15 years old?	Integer [min 1, max 8+]
2	Please enter the first name(s) of your children below (if you have more than one child aged 2 to 15 then please enter each from eldest to youngest)	Text boxes [number based on Q1]
3	For the purposes of this food diary we would like you only to focus on the child shown in the first line below. Please select the child named at the **^top^** of the list shown below	List [list of names from Q2, randomized]
4	The food diary will focus on [child names]'s eating habits. However there would be an opportunity to complete a food diary for any other children you have between the ages of 2 and 15. This would include an additional incentive of £10 for one food diary and £20 voucher for 2 or more per child. If you are interested in this please select 'Yes' below and research company Taylor McKenzie will email you with more information.	Yes = 1 No = 2
5	What is [child name]'s date of birth?	DD/MM/YYYY

No.	QUESTION	OPTIONS
	Please enter date of birth below (DD/MM/YYYY) *If age falls outside of age range, the following warning pops up: To qualify your child needs to be between 2 and 15 years old. If [child name] is not in this age range then please press the back button below and only enter in children aged between 2 and 15 at Q1 and Q2. If [child name] is in this age range then please press the back button below and check the date of birth you entered at Q5.	
6	What is [child name]'s sex?	Female = 2 Male = 1 Prefer not to say = 777
7	What is [child name]'s ethnicity?	White = 1 Asian or Asian British = 2 Black, Black British, Caribbean or African = 3 Mixed or multiple ethnic groups= 4 Other = 5 Prefer not to say = 777 Other: Please write in = text field
8	Which stage of education is [child name] at?	Pre-school = 1 Primary school = 2 Secondary school (or high school/academy) = 3
9	Does [child name] receive food parcels or vouchers in the school holidays?	Yes = 1 No = 2 Not sure = 999 Prefer not to say = 777
10	Including yourself, how many adults (18 years or older) live in your household?	Integer [min 1, max 20]
11	Including [child name], how many children (under 18 years) live in your household?	Integer [min 1, max 20]
The next questions relate to the challenges of feeding a family during the current cost of living crisis. They should be answered by the parent/guardian and will only be used to help us understand the survey results.		

No.	QUESTION	OPTIONS
If there are any questions which you do not want to answer, please choose 'Prefer not to say'. If you answer 'no' or 'prefer not to say' to any question you will not be asked the remaining questions. Press 'Next' to continue.		
During the **last 12 months**, was there a time when you or anyone in your household…		
12	...worried about running out of food because you couldn't afford or get access to it?	Yes = 1 No= 2 Prefer not to say = 777
13	...had smaller meals than usual or skipped meals because you couldn't afford or get access to food?	Yes = 1 No= 2 Prefer not to say = 777
14	...ran out of food because you couldn't afford or get access to it?	Yes = 1 No= 2 Prefer not to say = 777
15	…ate less to leave more food for your child / children?	Yes = 1 No= 2 Prefer not to say = 777
In the **past month**, how often has [child name] had…		
16	..white meat (e.g. chicken or turkey)	Never = 1 Less than once a week = 2 Once a week = 3 2-3 times a week = 4 4-6 times a week = 5 Every day = 6 Not sure = 999
17	..red and red processed meat (e.g. beef, pork, lamb, sausages, bacon, ham, corned beef or burgers)	Never = 1 Less than once a week = 2 Once a week = 3 2-3 times a week = 4 4-6 times a week = 5 Every day = 6 Not sure = 999
18	..white fish (e.g. fresh or frozen cod, haddock, sole and plaice, and breaded items like fish cakes or fish fingers)	Never = 1 Less than once a week = 2 Once a week = 3 2-3 times a week = 4 4-6 times a week = 5 Every day = 6 Not sure = 999
19	..oily fish	Never = 1 Less than once a week = 2 Once a week = 3

No.	QUESTION	OPTIONS
	(e.g. fresh, frozen or canned salmon, herring, kippers, mackerel, sardines, trout or pilchards. Does NOT include tuna)	2-3 times a week = 4 4-6 times a week = 5 Every day = 6 Not sure = 999
20	…other fish and shellfish (e.g. tuna, prawns, mussels, scallops or squid)	Never = 1 Less than once a week = 2 Once a week = 3 2-3 times a week = 4 4-6 times a week = 5 Every day = 6 Not sure = 999
21	[only those 3 years and younger to Q5] ...toddler milks (e.g. Aptamil, SMA , Kendamill, Cow and Gate)	Never = 1 Less than once a week = 2 Once a week = 3 2-3 times a week = 4 4-6 times a week = 5 Every day = 6 Not sure = 999
Contact Information ***In order for you to take part in this important study we will require your email and mobile number in order to send you the follow up food diaries.*** ***Which contact method would you prefer us to use when we contact you regarding the survey?*** *Please select at LEAST one*		
22	Email address	Email address:
22	Mobile phone number	11 digits
23	Please fill in your contact details, these will ONLY be used for communications in relation to this project.	Name: Email: Mobile:
Next steps and token of appreciation For completing 1 full food diary you will receive a £10 gift voucher. If you complete 2 or more food diaries then you will receive a £20 gift voucher. If you complete four food diaries, you can additionally enter a raffle for a chance to win one of three £100 gift vouchers.		
24	[only those in secondary school (or high school / academy) to Q8] You mentioned that [child name] was in secondary school (or high school / academy). Your child may be able to complete the next section about their food and drink intake themselves. Will they be completing the next section?	Yes = 1 No, I will complete the next section on their behalf = 2

No.	QUESTION	OPTIONS
25	[only those in secondary school (or high school / academy) to Q8 and who respond “Yes” to Q24] You mentioned that [child name] will complete the survey questions, which email should we send the follow-up “food diary” to?	The email given previously – [previous email] A different email address The mobile given previously – [previous mobile]
26	[only those in secondary school (or high school / academy) to Q8 and who respond “Yes” to Q24 and select “A different email address” in Q25] What is the best email address to send this to?	Email address:
27	[only those in secondary school (or high school / academy) to Q8] After completing the food and drink diaries, would you like the gift voucher to be sent to yourself or your child?	Myself = 1 My child = 2
28	After completing the food diaries we will send the gift voucher to you via email. Please select if this is suitable below	Email (recommended) Other: Please write in
29	What is your preference?	Amazon voucher Love2shop voucher
30	Which email should we send this to?	The one given previously – [previous email] A different email address
31	[only those selecting “A different email address” in Q25] Which email should we send this to?	The one given previously – [previous email] The one given previously – [previous email] A different email address
32	[only those selecting “A different email address” in Q31] What is the best email address to send this to?	Email address: Confirm email address:
33	Would you be willing to be contacted about any further research studies about your child’s eating habits?	Yes No
34	Would it be ok to contact you / your child about any further research studies about your child's eating habits?	Yes No

You mentioned that [child name] **will complete the next part of this survey and the food diaries.**

You can either ask them to do this now using your screen/device or your child can log in to the survey using the link and code on the letter you received at a time to suit.

All your responses to this point will have been saved and they will just be picking up from where you left off.

[*Back or Next*]

[only those in secondary school (or high school / academy) to Q8 above]

Young People Informed Consent

"**Hello [child name],**
Thanks for your interest in taking part in our study!
We want to check that you've read the young person information sheet [hyperlink to young person information sheet] that was sent with your parent / guardian's invitation letter?"

[*Yes, I have*]
[*No, I haven't*]

If [*Yes, I have*]
"

- I have read the information sheet for this study and know what is involved
- I know that I don't have to take part and I can change my mind at any time
- I agree to take part in this study

By continuing, you are agreeing to the above statements and have given informed consent. Press next to continue"

[*Next*] – Directs participants to the start of the online survey

If [*No, I haven't*]

"Please read the information sheet before deciding whether or not to take part. Your parent / guardian should have received a copy with their invitation letter or you can read it here [hyperlink to young person information sheet]"

[*I can now confirm that I have read the information sheet and I wish to continue*]
Drops down the same consent page above if they had clicked [Yes, I have]

[I do not wish to continue (this will close the survey when you press next)] – Blank screen with [Back or Submit]

Young People Online Survey

No.	QUESTION	OPTIONS				
Eating off school grounds at lunch time						
42	In a usual school week, how often do you buy food or drink from somewhere outside your school during your school lunch break?	Never = 1 [skip to Q45] 1-2 days a week = 2 3-4 days a week = 3 Every day = 4 Not sure = 999 Prefer not to say = 777				
43	We want you to think about why you buy food or drink off school grounds at lunch time. Please select how much you agree or disagree that each of the following factors influences whether you buy food or drink off school grounds at lunch time.					
	Because my friends do	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	Because I can't get the food I want in school	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	Because the canteen queue is too long	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	Because I want to get out of school	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	Because I don't like school lunches	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	Because I don't like the canteen	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	Because it's my right to choose where I go and buy food	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
44	Are there any other reasons why you buy food or drink off school grounds at lunch time? Please write in (or leave blank)	Text box				
Takeaways and Delivery						
We want you to think about how you buy foods and drinks for takeaway and delivery						
45	Have you ever used a mobile phone, tablet or computer to order food and drink for takeaway or home delivery?	Yes No				
46	What age were you when you first ordered food in this manner?	Please write in below… [text box]				
47	How often do you buy food or drink in this way? Please select	Several times a week About once a week About 2-3 times a month About once a month Less than once a month				
Energy drinks						
48						

49	In an average month, how often do you drink energy drinks (regular and/or sugar-free)? (e.g. Monster, Red bull, Relentless)	Never = 1 [skip to end survey page] Less than once a week = 2 1-2 days a week = 3 3-4 days a week = 4 5-6 days a week = 5 Every day = 6 Not sure = 999 Prefer not to say = 777				
50	We want you to think about why you drink energy drinks. Please tell us how important each of the following factors are in deciding to drink energy drinks					
	The taste	Not important	Slightly important	Somewhat important	Very important	Extremely important
	To not feel tired or sleepy / For an energy boost	Not important	Slightly important	Somewhat important	Very important	Extremely important
	To study better	Not important	Slightly important	Somewhat important	Very important	Extremely important
	Because my friends drink them	Not important	Slightly important	Somewhat important	Very important	Extremely important
	Because they cost less than other drinks	Not important	Slightly important	Somewhat important	Very important	Extremely important
51	Are there any other reasons why you drink energy drinks? Please write in (or leave blank)	Text box				

Next steps

When you press submit you will be taken to the first food diary of all the foods and drinks had on the previous day by [child name] - PLEASE NOTE: It is [child name]'s food consumption that should be entered into the food diary survey.

Please try to complete this just now (it should take about 10 minutes). Don't worry if you cannot do this just now, please just press submit below and **we will be in touch within 24 hours** with a link to access your first food diary.

If you are not taken directly to your first food diary upon pressing submit please wait on the email with your food diary link as described above.

Your second, third and fourth food diaries will be emailed/text to the contact information provided earlier in the survey two or more days after you have completed your most recent survey.

[Back or Submit]

Annexe 4. Food groups

Table 76. Food groups contributing to energy and nutrient intake from the National Diet and Nutrition Survey.

Cereals and cereal products
Pasta, rice, pizza and other miscellaneous cereals
White bread
Wholemeal bread
Brown, granary and wheatgerm bread
Other breads
High fibre breakfast cereals
Other breakfast cereals
Biscuits
Buns, cakes, pastries and fruit pies
Puddings
Milk and milk products
Whole milk (3.8% fat)
Semi skimmed milk (1.8% fat)
1% fat milk
Skimmed milk (0.5% fat)
Other milk and cream
Cheese
Yoghurt, fromage frais and other dairy desserts
Ice cream
Eggs and egg dishes
Fat spreads
Butter
Margarine and other fats and oils
Reduced fat spread polyunsaturated (41-75% fat)
Reduced fat spread not polyunsaturated (41-75% fat)
Low fat spread polyunsaturated (18-39% fat)
Low fat spread not polyunsaturated (18-39% fat)
Meat and meat products
Bacon and ham
Beef, veal and dishes
Lamb and dishes
Pork and dishes
Coated chicken and turkey
Chicken, turkey and dishes
Liver and dishes
Burgers and kebabs
Sausages
Meat pies and pastries
Other meat, meat products and dishes
Fish and fish dishes
White fish coated or fried including fish fingers

Other white fish, shellfish, fish dishes and canned tuna
Oily fish
Sandwiches
Vegetables and potatoes
Salad and other raw vegetables
Vegetables (not raw) including vegetable dishes
Chips, fried and roast potatoes and potato products
Other potatoes, potato salads and dishes
Crisps and savoury snacks
Nuts and seeds
Fruit
Sugar, preserves and confectionery
Sugars, including table sugar, preserves and sweet spreads
Sugar confectionery
Chocolate confectionery
Non-alcoholic beverages
Fruit juice
Soft drinks, not low calorie
Soft drinks, low calorie
Tea, coffee and water
Miscellaneous
Dry weight beverages
Soup, manufactured/retail and homemade
Savoury sauces, pickles, gravies and condiments
Toddler foods
Dairy-free

Annexe 5. Discretionary and additional foods

Table 77. Discretionary and additional foods contributing to energy and nutrient intake from the Food Standards Scotland (FSS) further analysis of the Scottish Health Survey (2021).

FSS category name	Food codes (names)	Excluding food description code (name)	Including food description code (name)
Sweet biscuits	7 (BISCUITS)	• 7649 (Bread sticks (e.g., Grissini)) • 251 (Cheese biscuit (e.g., cheddars, cheese savouries)), (Mini cheddars) • 252 (Cheese sandwich biscuits (e.g., Tuc cheese sandwich)) • 3973 (Corn cakes/thins) • 7650 (Cornish wafer) • 8330 (Cracker, reduced fat) • 258 (Crackerbread original (e.g., Ryvita)), (Melba toast) • 256 (Crackerbread wholegrain (e.g., Ryvita)), (Crispbread Rye with or without seeds (e.g., Ryvita)), (Multigrain crispbreads (e.g., Ryvita)), (Ryvita thins) • 255 (Cream cracker) • 273 (Ice cream cone (no ice cream)), (Plain ice cream wafer (no ice cream)) • 3267 (Japanese rice crackers), (Rice cake) • 267 (Oatcakes / Oat cakes) • 3236 (Rice cake, savoury flavoured (e.g., Snack a Jacks)) • 279 (Ritz / Saltines / Tuc), (Tuc crackers) • 10062 (Savoury cracker (e.g., Sesame and poppy thins, butter puffs, onion crackers, monaco))	N/A

		• 11242 (Sunbites crispy crackers (crisps)) • 274 (Water biscuit) • 765(Wholemeal cracker (e.g., Farmhouse cracker))	
Cakes, sweet pastries and puddings	• 8 (BUNS CAKES PASTRIES AND FRUIT PIES) • 9 (PUDDINGS)	N/A	N/A
Crisps and savoury snacks	42 (CRISPS AND SAVOURY SNACKS)	• 8033 (Coated and flavoured peanuts (e.g., Nobby's Nuts)) • 7876 (Taco shells)	
Confectionery	• 43 (SUGAR CONFECTIONERY) • 44 (CHOCOLATE CONFECTIONERY)	• 7762 (Ice lolly) • 2262 (Ice lolly, juice-based (e.g., Fruit pastilles)	8853 (Pop tart)
Ice cream and ice lollies	53 (ICE CREAM)	N/A	• 7762 (Ice lolly) • 2262 (Ice lolly, juice-based (e.g., Fruit pastilles)
Sugar-containing soft drinks	57 (SOFT DRINKS NOT LOW CALORIE)	N/A	N/A
Breakfast cereals	• 5 (HIGH FIBRE BREAKFAST CEREALS) • 6 (OTHER BREAKFAST CEREALS)	• 8853 (Pop tart)	N/A
Roast potatoes, chips and similar processed potato products	38 (CHIPS FRIED and ROAST POTATOES AND POTATO PRODUCTS)	N/A	• 5065 (Roast potatoes, cooked from frozen (e.g., Aunt Bessies)) • 11493 (Sweet potato fries)
Pizza	1C (PIZZA)	N/A	N/A
Yoghurt, fromage frais and dairy desserts	15 (YOGHURT FROMAGE FRAIS AND DAIRY DESSERTS)	N/A	N/A
Ready meals	N/A	N/A	Only the following were included: • 8049 (Macaroni cheese, ready meal)

- 9245 (Spaghetti bolognese, ready meal)
- 3187 (Beef lasagne, ready meal, reduced fat (e.g. Weight watchers))
- 1347 (Beef lasagne, ready meal)
- 9386 (Chicken curry, ready meal, with rice (e.g. balti, tikka masala)
- 9244 (Chilli con carne, ready meal, with rice)
- 8666 (Pasta carbonara (e.g. spaghetti), ready meal)
- 4283 (Sausage with vegetable mash, ready meal, reduced fat (e.g. Weight Watchers))
- 6393 (Chicken and pasta ready meal)
- 5321 (Shepherd's pie (lamb), ready meal)
- 7094 (Chicken korma, curry, ready meal, with rice)
- 9318 (Beef curry, ready meal, with rice)
- 9270 (Fish pie, toddler meal (e.g. Little Dish, Annabel Karmel)
- 1116 (Chicken/turkey roast dinner, ready meal)
- 5627 (Chicken curry, ready meal, with rice, reduced fat)
- 8286 (Vegetable curry, ready meal,

with rice (e.g balti, tikka masala)
- 9726 (Sweet and sour pork, ready meal, with rice)
- 5313 (Beef stew/hotpot/hot pot, toddler meal (e.g. Heinz, Ella's kitchen))
- 3680 (Chicken kiev)
- 5263 (Chicken goujon/nugget/dipper, in breadcrumb or batter)
- 38 (Macaroni cheese, canned)
- 5131 (Meatballs in gravy, canned)
- 39 (Ravioli (filled pasta) in tomato sauce, canned)
- 9273 (Spaghetti bolognese, canned)
- 3238 (Vegetable curry, canned)
- 8055 (Vegetarian chicken-style nuggets/goujons, in breadcrumbs (e.g. Quorn nuggets))
- 4121 (Vegetarian crispbakes (e.g. cheese and onion))
- 10263 (Bacon and cheese grills)
- 8288 (Vegetable fingers/nuggets)
- 7137 (Vegetable grills (e.g. Dalepak))