National Children's Food Survey II

Summary Report

September 2019

(Amended May 2020)

Irish Universities Nutrition Alliance (IUNA)

National Children's Food Survey II

Summary Report on:

Food and Nutrient Intakes, Body Weight, Physical Activity and Eating Behaviours in Children Aged 5-12 Years in Ireland

Irish Universities Nutrition Alliance (IUNA)

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Main Outcomes

Food and beverage intakes

Staple foods for Irish children aged 5-12 years (i.e. foods consumed by practically all children in amounts sufficient to make important nutritional contributions to the diet) are breads, potatoes, milks, meats, fruits, vegetables and breakfast cereals.

Intakes of fruit and vegetables are low, about 3 servings per day, well below the recommended 5-7-a-day. This includes about one serving of vegetables and 2 servings of fruit, including a half serving as unsweetened fruit juice.

The average daily intake of bread was 85g (approximately 2 slices) with 53g as white bread and 25g as wholemeal/brown bread.

Breakfast cereals were consumed by 91% of children with an average daily intake of 53g, of which 28g were from ready-to-eat breakfast cereals (85% consumers) and 25g as hot oat cereals such as porridge (28% consumers).

Average consumption of milk is about one glass per day, mainly as whole milk rather than reduced fat milk.

Essentially all children eat meat; however, more is consumed as processed meat than fresh meat. Chicken was the most popular type of fresh meat consumed, followed by beef.

The main beverages consumed are water, milk, soft drinks (more as 'no added sugar' than as sugar-sweetened) and unsweetened fruit juice.

Overall, 22% of children consumed a food supplement over the 4-day survey period, with 'multivitamins and minerals' and multivitamins being the most common types consumed.

Dietary changes that have occurred since the National Children's Food Survey (NCFS) in 2003-04 include reduced intake of milk, fruit juice and sugar-sweetened drinks, and increased intake of fruit, wholemeal/brown bread and water.

Energy and nutrient intakes

Important sources of calories in the diet are bread and cereal products, meats, milk and dairy products and potatoes. About 18% of calories are provided by 'top shelf' foods (i.e. 'biscuits, cakes and pastries', 'sugars, confectionery, preserves and savoury snacks' and 'sugar-sweetened soft drinks') that are low in essential nutrients.

Eating at home is the main source of calories (87%) and the main influence on dietary quality for children in this age group.

Saturated fat accounted for 14% of total energy intake, exceeding the recommendation of no more than 10%. The key contributors to saturated fat intake were meat and meat products (18%), milks (15%) and spreading fats (9%), while 'top shelf' foods combined (i.e. 'biscuits, cakes and pastries' and 'sugars, confectionery, preserves and savoury snacks') contributed 22%.

Main Outcomes

Mean intake of free sugars was 9.5% of energy with 40% of children having intakes above the recommended maximum of 10% of energy. Intake of free sugars was lower than in the NCFS (2003-04) (16% of energy), mainly due to a switch in beverage consumption from sugar-sweetened drinks to water.

Average daily dietary fibre intake (14g) was higher than in the NCFS (2003-04) (12g) but lower than the recommendations by the European Food Safety Authority (EFSA) for children of this age (14-19g). The key contributors to dietary fibre intake were breads, breakfast cereals, fruits, cereal grains and vegetables.

Average daily intake of salt (5g) was higher than the maximum levels recommended by the Food Safety Authority of Ireland (FSAI) for children of this age. Meats, especially cured and processed meats, and breads are the main contributors to salt intake. Average salt intake has decreased by about 1g since 2003-04.

Intakes of most vitamins and minerals were adequate. However, significant numbers of children have inadequate intakes of vitamin D, calcium, iron and folate. Important sources of vitamins and minerals were milk and milk products, meats, breads and cereals, especially fortified breakfast cereals, and fruits and vegetables.

Body weight

Overall, the majority (78%) of children were within the normal weight range, while 16% (boys 14%, girls 19%) were classified as overweight or obese. The prevalence of overweight and obesity was lower than in the NCFS (2003-04) when 25% of children (boys 19%, girls 30%) were classified as overweight or obese.

Physical activity

Participation of children in physical activities is relatively high with an average of 81 minutes per day being physically active. A total of 69% of children achieved the recommended 'at least 60 minutes' of physical activity per day. Median daily time in sedentary behaviours was 254 minutes, with 86 minutes of screen time.

Eating behaviours

The majority of parents (70%) found it sometimes difficult to provide a healthy diet for their child, with the main perceived barriers being: 'the child's likes or dislikes' (64% of parents), 'convenience' (40%), 'other people minding your child' (39%) and 'food advertising' (34%).

Introduction

This Summary Report describes the methods and main findings on food and beverage consumption, nutrient intakes, body weight and factors associated with children's eating behaviours from the National Children's Food Survey II (NCFS II). The NCFS II was a cross-sectional survey designed to assess the food and nutrient intakes of children aged 5 to 12 years, representative of this age group in the population of the Republic of Ireland.

The NCFS II was carried out by the Irish Universities Nutrition Alliance (IUNA), an alliance of the nutrition centres at academic institutions in Ireland, including University College Cork, University College Dublin, Cork Institute of Technology and Technological University Dublin, which is committed to joint initiatives in research and teaching. To date, the IUNA has carried out a number of comprehensive national nutrition surveys: The North/South Ireland Food Consumption Survey (2001) of adults aged 18 to 64 years; The National Children's Food Survey (2005) of children aged 5 to 12 years; The National Teens' Food Survey (2008) of children aged 13 to 17 years; The National Adult Nutrition Survey (2011) of adults aged 18 to 90 years and The National Preschool Nutrition Survey (2012) of children aged 1 to 4 years (all available at www.iuna.net).

The NCFS II is designed to provide detailed data on food and beverage consumption and is suitable for a wide range of applications related to food safety and nutrition. These include assessment of exposure to chemical and biological hazards in foods, development and implementation of food and nutrition policy and food product development and promotion.

Findings from the NCFS II may be compared with those from the National Children's Food Survey (NCFS) of 594 Irish children aged 5-12 years carried out by IUNA researchers in 2003-04 which used similar methodology.

A more detailed 'Main Survey Report' containing additional survey methodology and detailed data tables may be found at www.iuna.net.

Summary of methods used

A sample of 600 children (300 boys, 300 girls) aged 5 to 12 years from across the Republic of Ireland took part in the NCFS II. Ethical approval for the study was obtained from the Clinical Research Ethics Committee of the Cork Teaching Hospitals and the Human Ethics Research Committee of University College Dublin.

A database of primary schools in Ireland (provided by the Department of Education and Skills) was used to select schools to provide a demographically balanced sample with respect to urban/rural divide and socio-economic grouping. The principals of selected schools were contacted, with 80% of those contacted agreeing to take part in the study. Parents/guardians of children who were randomly selected from the school roll were contacted with information on the survey and participation was invited. Where families opted in, a researcher visited the home to explain the survey in more detail and to obtain consent from both parents/guardians and the child. Fieldwork was carried out from April 2017 to May 2018, giving a seasonal balance. The overall response rate for the survey was 65%.

Participating families were asked to record detailed information on the amount and type of all foods, drinks and food supplements consumed by the child over four consecutive days (including one weekend day) in a food diary. Participants were provided with a digital food scales and asked to weigh as many foods as possible, including leftovers. Eighty-seven per cent of foods consumed were weighed directly or assigned a manufacturer's weight. Where foods were not weighed, researchers used age-appropriate photographic food atlases, standard portion sizes and household measures at subsequent visits to aid with quantifying the amount of food consumed. Participants were encouraged to keep food packaging to provide further detail on the foods consumed. Nutrient intakes were estimated from food intakes using tables of food composition. Usual intakes of nutrients were estimated using the validated National Cancer Institute (NCI-Method) using SAS Enterprise Guide©. A single first-void morning urine sample was also collected from children during the recording period to estimate salt intake.

Physical measurements (height, weight, % body fat, and waist and hip circumference) of the children were obtained. Participants and parents/guardians completed questionnaires on general health and lifestyle and determinants of food choice and eating behaviours for the child. Physical activity levels were estimated using the validated Child Physical Activity Questionnaire (C-PAQ) in 5-8 year olds and the Youth Physical Activity Questionnaire (Y-PAQ) in 9-12 year olds.

Demographic analysis of the sample showed it to be representative of children in Ireland with respect to age, gender and urban/rural divide when compared to Census 2016 data. However, the sample contained a higher proportion of children of professional workers and a lower proportion of children of semi-skilled and unskilled workers than the national population and all data in this report have been weighted to account for these differences.

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Chapter 1 Food and beverage intakes

Introduction

This chapter describes the food intakes of Irish children aged 5-12 years and reports on the proportions of children who consumed different foods and beverages and the amounts that they consumed **(Tables 1-6)**.

Breads, cereals & potatoes

Bread is a staple food in the diets of Irish children, consumed by 99% of children. The average daily intake of total bread was 85g (approximately 2 slices of bread) **(Table 1)**. Of the total bread intake, 53g was consumed as white bread and 25g as wholemeal/brown bread. **Figure 1** shows that while the average daily amount of bread consumed by Irish children has not changed since 2003-04 (82g), the amount consumed as wholemeal/brown bread is now higher (25g v 12g) as is the proportion of children who are consumers of wholemeal/brown bread (54% v 40%).

Breakfast cereals were consumed by 91% of children with 85% consuming ready-to-eat breakfast cereals and 28% consuming hot oat cereals such as porridge. The mean daily intake of ready-to-eat breakfast cereals was 28g, of which high fibre cereals (≥6g of fibre/100g) such as wheat biscuits accounted for 16g. The mean daily intake of porridge and other hot oat cereals was 25g **(Table 1)**.

Mean daily intakes of pasta and rice were 25g and 12g, respectively. The mean daily intake of savouries (e.g. pizza, fried rice and other savoury dishes) was 28g.

The mean daily intake of potatoes and potato products was 61g with 32g coming from boiled/mashed/baked potatoes and a further 23g from chipped, fried and roast potatoes **(Table 1)**. Average daily potato consumption was lower than reported in 2003-04 (98g).

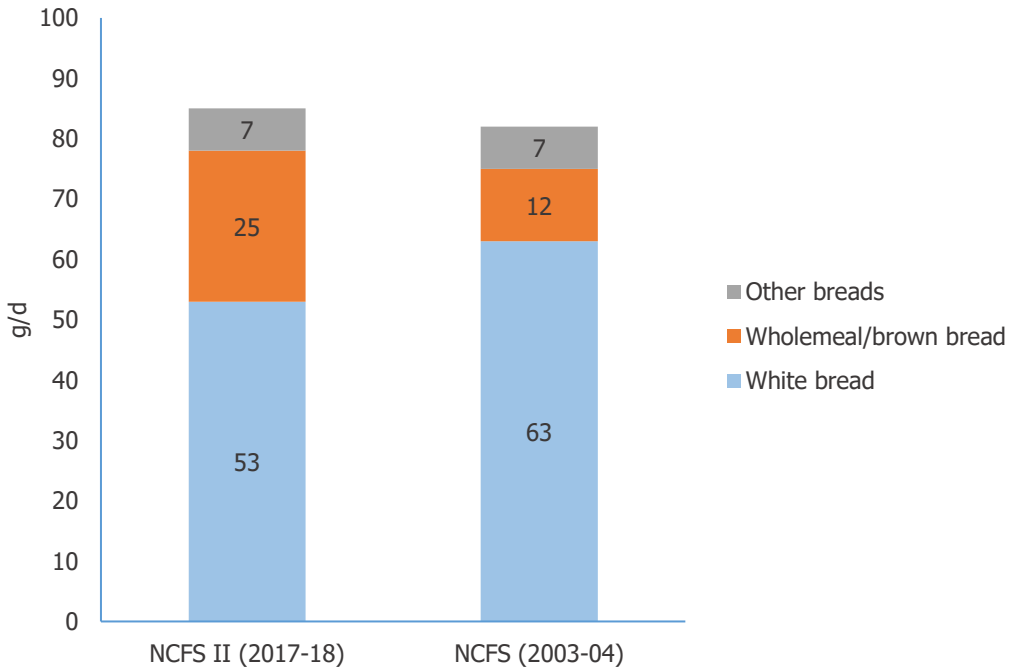

Figure 1. Mean daily intakes of white, wholemeal/brown and other breads in the NCFS II and NCFS

Milk, dairy products & spreading fats

Milk is a staple food in the diets of Irish children, consumed by 91% of children, mainly as a beverage or with breakfast cereal. The mean daily intake of milk was 186g, just under one serving (200ml) **(Table 2)**. Milk was mainly consumed as whole milk (70%) with 28% as reduced fat milk. Just 2% of all milk consumed was non-dairy milk (e.g. nut milks, soya milk). Average intakes of total milk and whole milk are lower than reported in 2003-04 **(Figure 2)**.

Cheese was consumed by 63% of children with an average daily intake of 11g. Yogurt was consumed by 59% of children with an average daily intake of 34g. Consumption of cheese and yogurt has remained similar to that reported in 2003-04.

Average daily intake of spreading fats was 7g, similar to that reported in 2003-04 (9g).

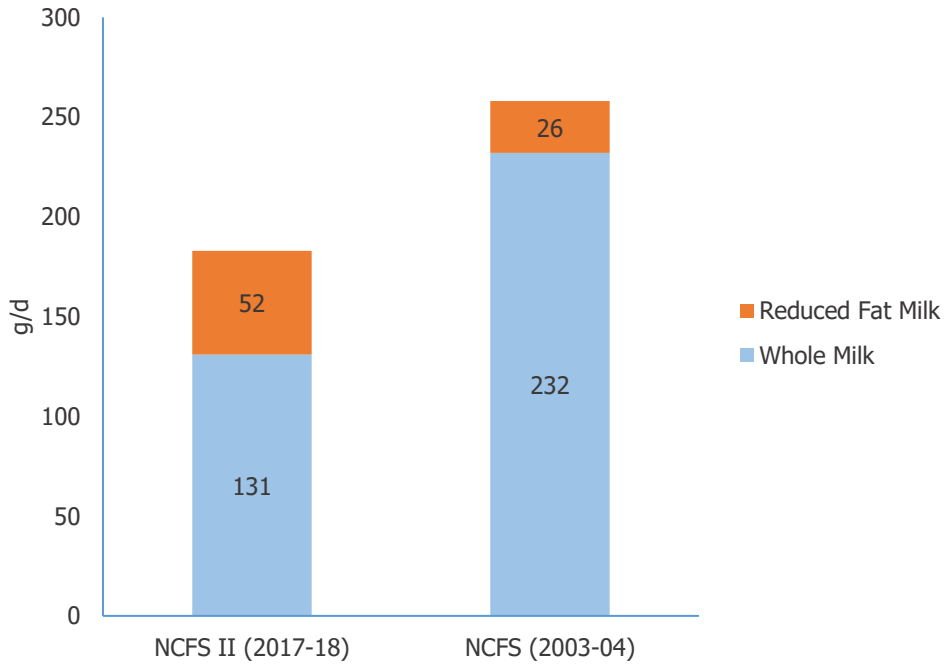

Figure 2. Mean daily intakes of whole and reduced fat milks in the NCFS II and NCFS

Meat, fish, eggs, nuts & seeds

Meat is a staple food in the diets of Irish children and was consumed by 98% of children with a mean daily intake of total meat of 116g (equivalent to one small chicken breast) **(Table 3)**. Poultry (mainly chicken) was the most popular type of fresh meat consumed, followed by beef. Average daily intake of processed meat was 41g. These findings show little difference from that reported in 2003-04 (total meat 105g, processed meat 46g).

The mean daily intake of fish and fish dishes was 13g, of which 4g was consumed as oily fish. Forty-five per cent of discrete fish consumed was coated fish.

The mean daily intake of eggs and egg dishes was 10g with 35% of children consuming eggs.

The mean daily intake of nuts and seeds was <1g with only 8% of children consuming one or the other.

Fruit & vegetables

Fruit was consumed by practically all children (97%) with an average daily intake of 90g of discrete fruit. Apples, bananas and oranges were the most common fruits consumed **(Table 4)**. Average intake of whole fruit was higher than in 2003-04 (59g), although the types of fruits commonly consumed have remained unchanged. Average daily intake of pure (100%) fruit juice was 38g, lower than in 2003-04 (86g).

Children consumed vegetables either alone (as discrete vegetables) or as part of composite dishes (e.g. within a pie or a stew). Discrete vegetables were consumed by most children (85%) with an average daily intake of 40g (equivalent to one medium cooked carrot, one broccoli spear or one tablespoon of baked beans) **(Table 4)**. However, 15% of children consumed no discrete vegetables over the 4-day recording period. The most popular vegetables consumed were carrots, baked beans and broccoli. The average daily intake of vegetables has remained the same as that reported in 2003-04 (39g) as have the types of vegetables consumed.

Overall, intakes of fruit and vegetables are low, about 3 servings per day, well below the recommended 5-7-a-day. This includes about one serving of vegetables and 2 servings of fruit, including a half serving as unsweetened fruit juice.

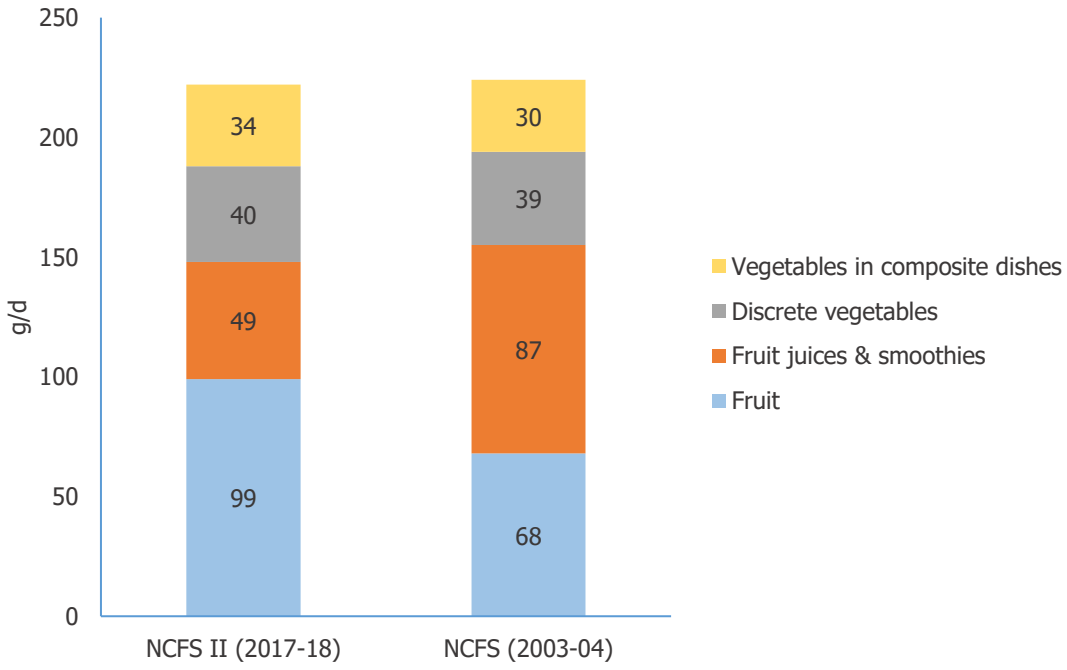

Figure 3. Mean daily intakes of fruit and vegetables in the NCFS II and NCFS

Biscuits, cakes, confectionery & savoury snacks

Biscuits, cakes, confectionery and savoury snacks were widely consumed among children with an average daily combined intake of 76g **(Table 5)**. Overall, these findings are similar to those reported in 2003-04 (85g).

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Beverages

Water was the most commonly consumed beverage (95% of children) with an average daily intake of 450g **(Table 6)**, most as still water but also as flavoured water with no added sugar. Milk was consumed as a beverage by 58% of children, with a mean daily intake of 91g (about half a glass). Soft drinks (with and without added sugar) were consumed by 67% of children with an average daily intake of 160g, with 110g coming from the no added sugar variety and 50g sugar-sweetened. Consumption of sugar-sweetened soft drinks was lower than in 2003-04 (average daily intake of 252g).

Food supplements

Overall, 22% of children consumed a food supplement over the 4-day recording period. A total of 102 different types (brands) of food supplements were recorded. Multivitamins and minerals were the most common type (30% of all supplements recorded), followed by multivitamins (25%) (**Figure 4)**. Single vitamin D supplements were consumed by 10% of children. The percentage of consumers of food supplements was similar to that reported in 2003-04 (25%).

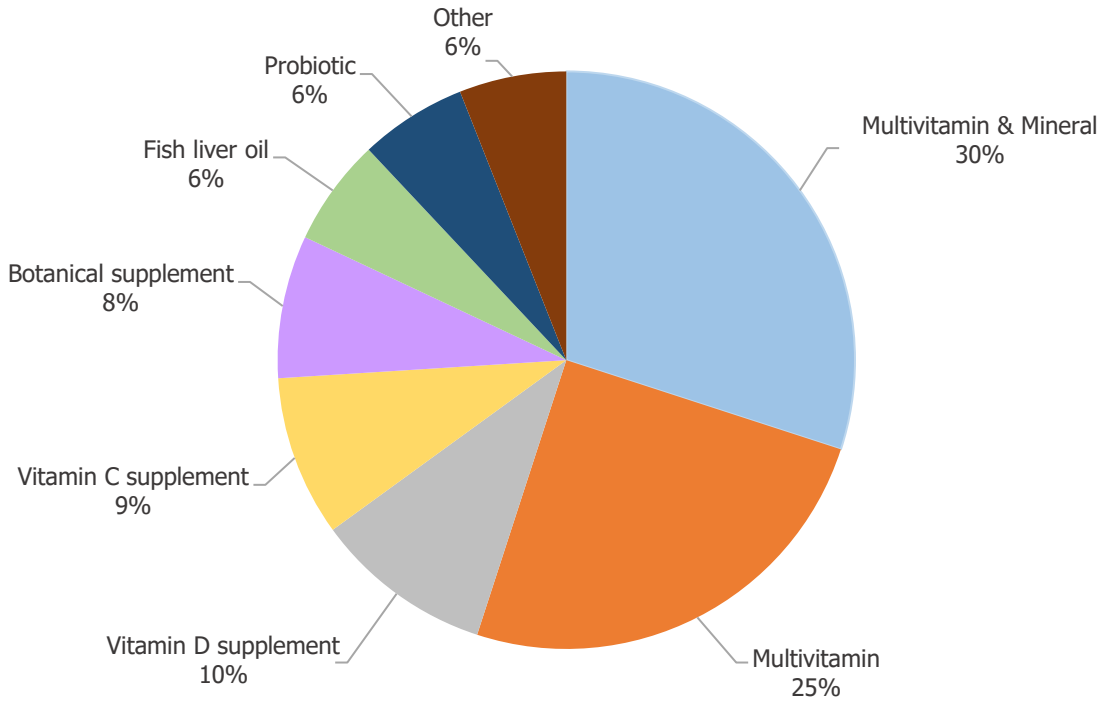

Figure 4. Categories of food supplements consumed in the NCFS II

Table 1. Mean daily intakes (g) of bread, cereals & potatoes in children aged 5-12 years (total population and consumers only) in the NCFS II and NCFS

	NCFS II (2017-18) *(n = 600)*					**NCFS (2003-04)** *(n = 594)*				
	Population			Consumers only		Population			Consumers only	
	Mean	SD	%	Mean	SD	Mean	SD	%	Mean	SD
Total bread	85	45	99	86	45	82	39	100	82	39
of which										
White bread	53	42	89	60	40	63	37	98	64	37
Wholemeal & brown bread	25	36	54	47	37	12	24	40	30	30
Other breads (e.g. garlic bread, fruit breads, scones)	7	17	27	26	22	7	13	40	18	15
Breakfast cereals	53	53	91	58	52	42	40	94	41	36
of which										
Ready-to-eat breakfast cereals	28	23	85	33	22	31	24	93	33	23
high-fibre cereals (≥6g/100g)	16	20	59	26	20	11	17	54	20	19
low-fibre cereals (<6g/100g)	13	17	54	23	17	20	21	79	25	21
Porridge & hot oats cereals (made up)	25	51	28	90	59	11	36	17	66	62
Pasta, rice & savouries	72	61	89	81	59	58	50	89	65	48
of which										
Pasta	25	35	53	47	36	15	24	46	34	25
Rice	12	23	32	36	28	10	19	36	27	24
Other cereals (e.g. noodles, couscous, quinoa)	7	23	16	43	44	5	17	16	33	30
Pizza	19	33	37	51	36	15	23	51	29	26
Other savouries (e.g. fried rice)	9	23	26	36	33	12	23	42	29	27
Potatoes & potato products	61	49	92	66	47	98	57	100	99	57
of which										
Boiled, baked & mashed potatoes	32	36	65	49	34	53	49	88	60	47
Chipped, fried & roasted potatoes	23	29	65	36	29	40	32	89	45	31
Processed & homemade potato products	6	20	18	33	35	6	15	28	20	23

Table 2. Mean daily intakes (g) of milk, dairy products & spreading fats in children aged 5-12 years (total population and consumers only) in the NCFS II and NCFS

	NCFS II (2017-18) *(n = 600)*					**NCFS (2003-04)** *(n = 594)*				
	Population			Consumers only		Population			Consumers only	
	Mean	SD	%	Mean	SD	Mean	SD	%	Mean	SD
Total milk	186	156	91	204	151	258	185	96	268	181
of which										
Whole milk	131	154	68	193	151	232	186	90	257	178
Reduced fat milk	52	110	31	168	140	26	86	17	150	155
Non-dairy alternatives	3	19	3	89	69	<1	4	<1	42	35
Sweetened milk drinks	16	43	19	83	64	15	36	23	64	52
Dairy Products										
Yogurts & fromage frais	34	43	59	57	43	39	43	71	55	42
Cheeses	11	13	63	17	13	8	10	59	13	10
Ice-creams	8	15	36	23	16	14	19	64	23	19
Creams	<1	3	6	8	8	<1	1	6	4	5
Dairy desserts (e.g. rice pudding, custard)	5	20	9	53	48	3	13	12	28	28
Spreading fats	7	7	87	8	6	9	8	93	10	7

Table 3. Mean daily intakes (g) of meat, fish, eggs, nuts & seeds (g/d) in children aged 5-12 years (total population and consumers only) in the NCFS II and NCFS

	NCFS II (2017-18) *(n = 600)*					**NCFS (2003-04)** *(n = 594)*				
	Population			Consumers only		Population			Consumers only	
	Mean	SD	%	Mean	SD	Mean	SD	%	Mean	SD
Total meat	116	69	98	118	68	105	55	98	107	54
of which										
Meat dishes	47	58	64	74	58	37	40	71	52	39
Processed meat	41	36	91	45	35	46	30	95	48	28
Fresh meat	28	31	73	38	36	23	22	86	26	22
Poultry	18	26	56	32	28	12	14	66	19	14
Beef	7	14	29	24	17	5	11	39	14	13
Pork	2	9	10	24	17	3	7	22	13	11
Lamb	<1	5	4	20	13	2	6	14	13	10
Total fish	13	29	41	32	38	9	14	48	19	15
of which										
White fish, coated	4	11	19	24	13	4	8	32	14	10
Oily fish	4	21	14	26	53	<1	4	8	12	23
White fish, uncoated	1	6	5	23	14	<1	4	4	15	11
Other fish	1	6	7	19	14	2	6	12	14	13
Fish dishes	3	14	7	39	39	1	8	4	30	24
Eggs & egg dishes	10	17	35	28	19	8	13	42	18	14
Nuts & seeds	<1	4	8	9	10	<1	2	8	5	4

Table 4. Mean daily intakes (g) of fruit, fruit juices & vegetables in children aged 5-12 years (total population and consumers only) in the NCFS II and NCFS

	NCFS II (2017-18) *(n = 600)*					**NCFS (2003-04)** *(n = 594)*				
	Population			Consumers only		Population			Consumers only	
	Mean	SD	%	Mean	SD	Mean	SD	%	Mean	SD
Total fruit & vegetables	221	129	100	221	129	224	153	100	224	153
Fruit & fruit juices	147	115	97	151	114	155	135	98	157	132
Discrete Fruit	90	70	92	98	68	59	53	85	69	51
of which										
Apples	27	30	63	43	28	24	32	59	41	33
Bananas	20	29	47	43	29	12	19	44	28	19
Citrus fruits	11	23	32	35	29	7	15	31	24	19
Other fruits	32	43	64	50	44	15	27	46	33	32
Fruit in composite dishes	9	14	84	11	14	9	11	94	10	11
Fruit juice (100% fruit)	38	75	40	94	94	86	113	67	128	116
Smoothies	11	36	12	94	55	<1	6	2	36	31
Total vegetables	74	49	99	75	49	69	52	98	70	52
Discrete vegetables	40	38	85	47	37	39	35	92	42	34
of which										
Peas, beans & lentils	11	21	45	24	26	12	18	60	20	20
Baked beans	7	19	20	33	29	8	16	38	22	19
Carrots	9	14	52	18	15	9	12	60	15	13
Green vegetables	6	11	38	16	12	6	10	45	13	11
Other vegetables	14	20	59	24	21	12	18	61	19	19
Vegetables in composite dishes	34	32	95	36	32	30	28	97	31	28

Table 5. Mean daily intakes (g) of biscuits, cakes, confectionery & savoury snacks in children aged 5-12 years (total population and consumers only) in the NCFS II and NCFS.

	NCFS II (2017-18) *(n = 600)*					**NCFS (2003-04)** *(n = 594)*				
	Population			Consumers only		Population			Consumers only	
	Mean	SD	%	Mean	SD	Mean	SD	%	Mean	SD
Total confectionery/snacks	76	48	99	77	48	85	42	100	85	42
of which										
Biscuits & crackers	16	17	80	20	17	15	13	87	17	13
Cakes, pastries & buns	15	21	57	27	22	11	14	60	18	14
Desserts	13	28	35	38	35	9	17	34	26	21
Chocolate confectionery	9	11	59	15	11	17	17	84	20	17
Savoury snacks	9	12	63	15	12	12	11	85	15	11
Sugar confectionery	7	16	40	17	21	13	18	75	17	19
Sugars, sweeteners, preserves & spreads	5	7	66	8	7	6	11	77	8	12
Cereal bars	2	6	18	12	8	2	5	17	10	8

Table 6. Mean daily intakes (g) of beverages in children aged 5-12 years (total population and consumers only) in the NCFS II and NCFS

	NCFS II (2017-18) *(n = 600)*					**NCFS (2003-04)** *(n = 594)*				
	Population			Consumers only		Population			Consumers only	
	Mean	SD	%	Mean	SD	Mean	SD	%	Mean	SD
Water as a beverage	450	315	95	471	307	-	-	-	**-**	-
of which										
Flavoured water	11	55	7	162	140	-	-	-	**-**	-
Soft drinks*	160	221	67	238	233	331	285	95	348	282
of which										
Soft drinks, no added sugar¥	110	201	47	235	240	78	206	40	195	288
Soft drinks, added sugar¥	50	93	40	124	111	252	227	93	272	225
Milk as a beverage	91	127	58	158	131	-	-	-	-	-
Fruit juice (100% juice)	38	75	41	93	94	86	113	67	128	116
Teas	28	78	19	149	122	31	68	36	88	89
Sweetened milk drinks	16	43	19	83	64	15	36	23	64	52
Smoothies	11	36	12	94	55	<1	6	2	36	31
Coffees	1	11	1	77	55	5	22	11	45	54

*carbonated beverages, fruit juice drinks, squashes and cordials

¥ Soft drinks values for NCFS II (2017–18) amended 20th May 2020

Chapter 2 Energy and nutrient intakes

Introduction

This chapter describes the average daily intakes of energy, dietary fibre and nutrients of Irish school-aged children aged 5-12 years. For energy, dietary fibre and selected nutrients, the key dietary sources are also shown. Energy and nutrient intakes have been estimated using food composition tables, updated with current manufacturers' information where applicable. Estimates of nutrient intakes include contributions from nutritional supplements and fortified foods.

Energy and macronutrients

Average daily intakes of energy and macronutrients of Irish school-aged children aged 5-12 years are reported in **Table 7,** together with data for the same age-group from the NCFS (2003-04). On average, 5-12 year children consumed 1487kcals of energy per day. The main sources of energy **(Figure 5)** were bread and rolls (14%), meat and meat products (14%), milk and yogurt (10%), breakfast cereals (9%), other cereals (9%) and potatoes (5%). When combined, 18% of energy was provided by 'top shelf' foods (i.e. 'biscuits, cakes and pastries', 'sugars, confectionery, preserves and savoury snacks' and sugar-sweetened drinks). The percentage of energy consumed outside the home environment in this survey (13%) was similar to that reported in 2003-04 (10%).

The average percentage of energy coming from protein was 16% and the main contributors to protein intake were meat and meat products (33%), milk and yogurt (14%) and bread and rolls (13%) **(Figure 6)**.

The average percentage of energy from fat was 33%, which meets the UK Department of Health recommendation of less than 35%. The average contribution of saturated fat to energy intake (14%) was higher than recommended (less than 10%). The key contributors to saturated fat intake were meat and meat products (18%), milks (15%) and spreading fats (9%), while 'top shelf' foods combined (i.e. 'biscuits, cakes and pastries' and 'sugars, confectionery, preserves and savoury snacks') contributed 22% **(Figure 8)**.

The average percentage of energy from carbohydrate was 50%, which meets the recommendation from the UK of approximately 50%. The main contributors to carbohydrate intake were bread and rolls (21%), breakfast cereals (12%), and grains, rice, pasta and savouries (11%) **(Figure 9)**. When combined, 19% of carbohydrate was provided by 'top shelf' foods (i.e. 'biscuits, cakes and pastries', 'sugars, confectionery, preserves and savoury snacks' and sugar-sweetened drinks).

Mean intake of free sugars in Irish children was 9.5% of energy with 40% of children having intakes above the World Health Organisation recommendation of less than 10% of energy. This was lower than in the previous NCFS (2003-04) (16%) mainly due to a switch from sugar-sweetened beverages to water. Overall, 54% of free sugar intake was provided by 'top shelf' foods **(Figure 10).**

Table 7. Mean daily intakes of energy, dietary fibre and macronutrients in the NCFS II and NCFS

		NCFS II (2017-18) *(n = 600)*		**NCFS (2003-04)** *(n = 594)*	
		Mean	SD	Mean	SD
Energy	MJ	6.3	1.2	7.0	1.4
	kcal	1487	275	1667	323
Protein	g	59.6	14.1	56.6	13.4
	(%E)	16.2	2.1	13.7	1.8
Total fat	g	55.8	12.7	63.1*	14.2
	(%E)	33.3	3.8	33.7	3.6
Saturated fat	g	23.4	5.6	27.3*	6.7*
	(%E)	14.0	2.2	14.5*	2.1*
Carbohydrate	g	197	38.3	231	47.0
	(%E)	50.0	4.3	52.1	4.2
Total sugars	g	73.7	19.4	107	29.3
	(%E)	18.7	4.0	23.9	4.7
Free sugars	g	38.4	14.9	73.4	26.2
	(%E)	9.5	3.4	16.3	5.0
Dietary fibre	g	14.4	3.5	12.4	3.5

*Fat values for NCFS (2003-04) amended 30th September 2019

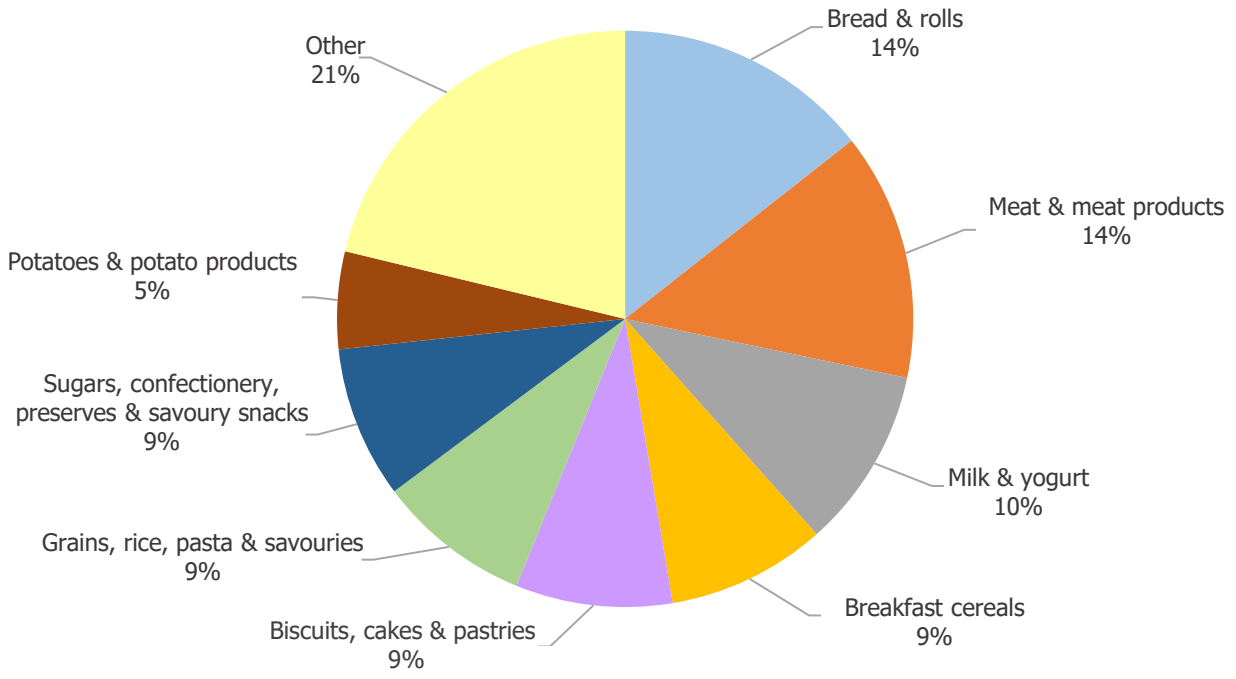

Figure 5. Sources of energy in Irish children aged 5-12 years

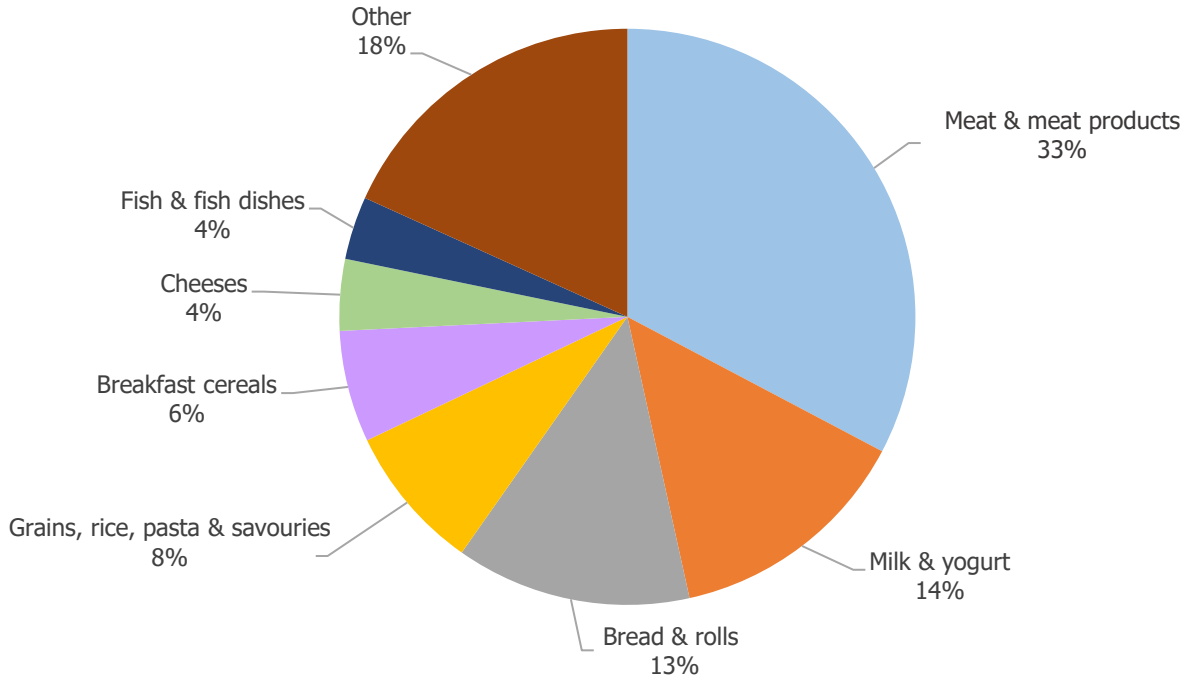

Figure 6. Sources of protein in Irish children aged 5-12 years

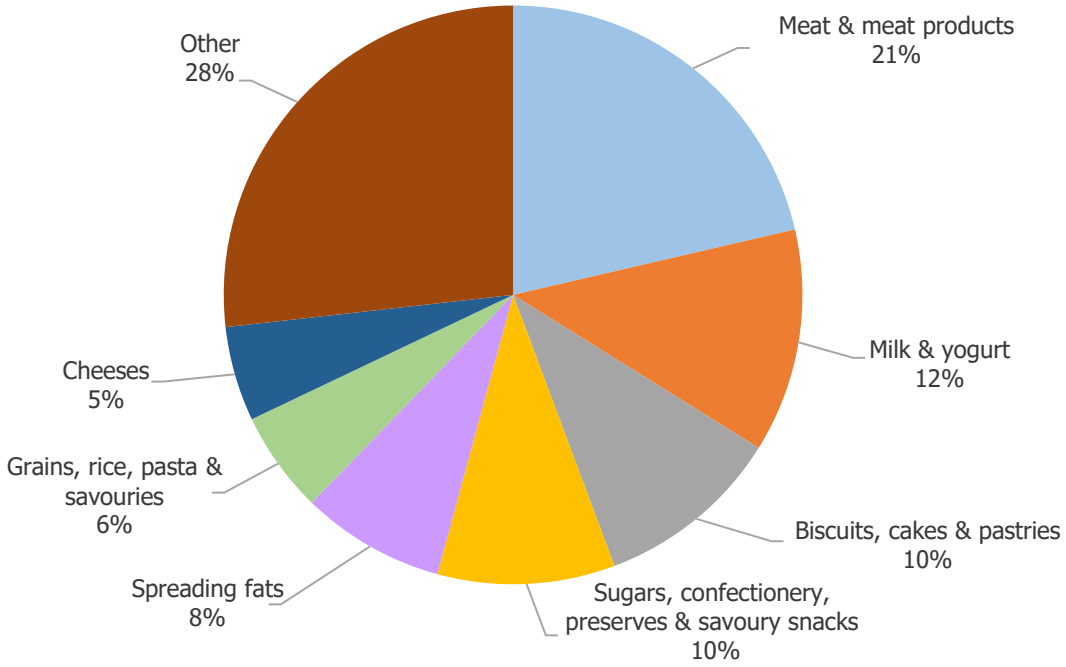

Figure 7. Sources of total fat in Irish children aged 5-12 years

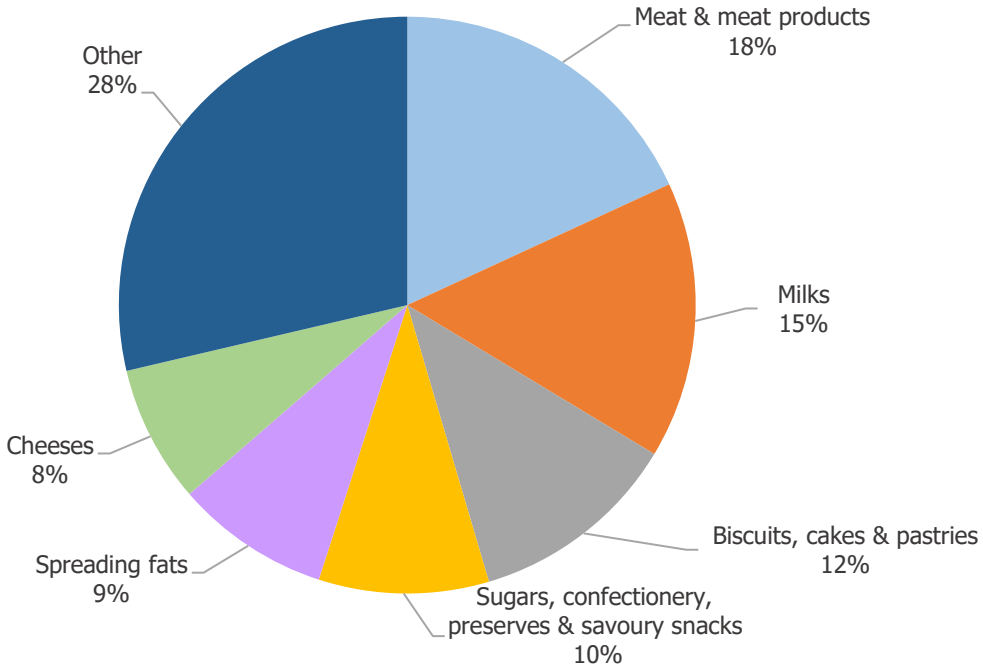

Figure 8. Sources of saturated fat in Irish children aged 5-12 years

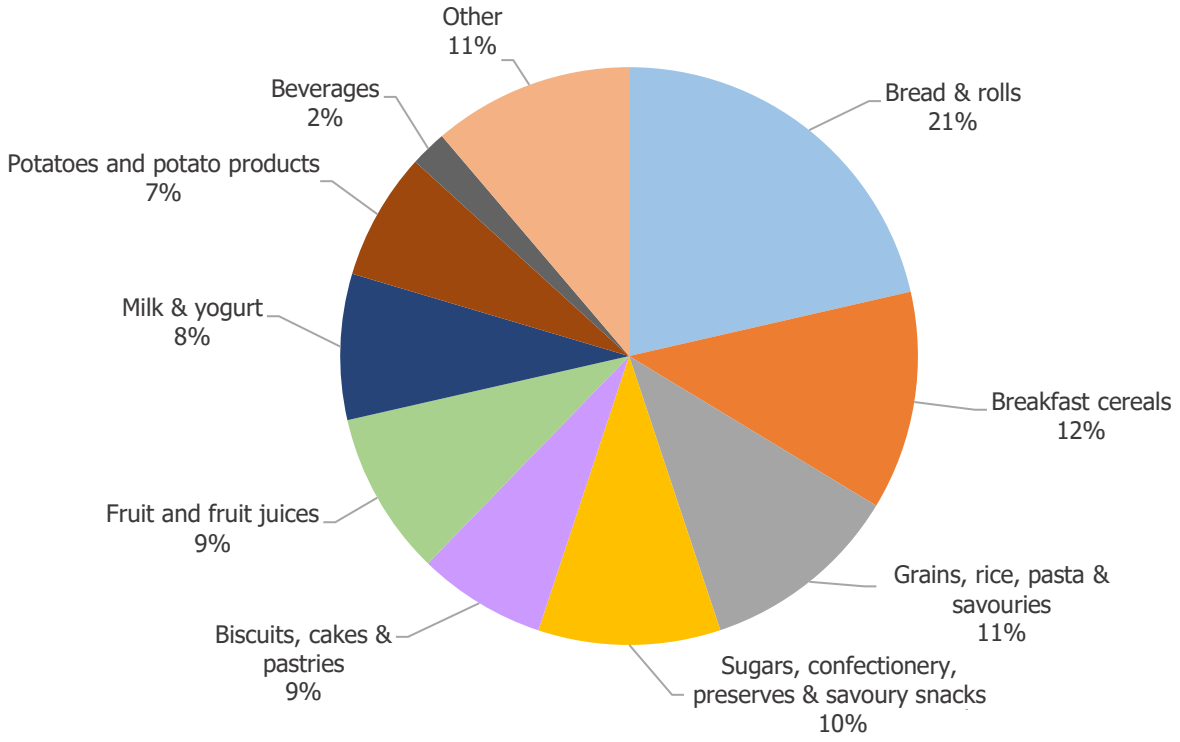

Figure 9. Sources of carbohydrate in Irish children aged 5-12 years

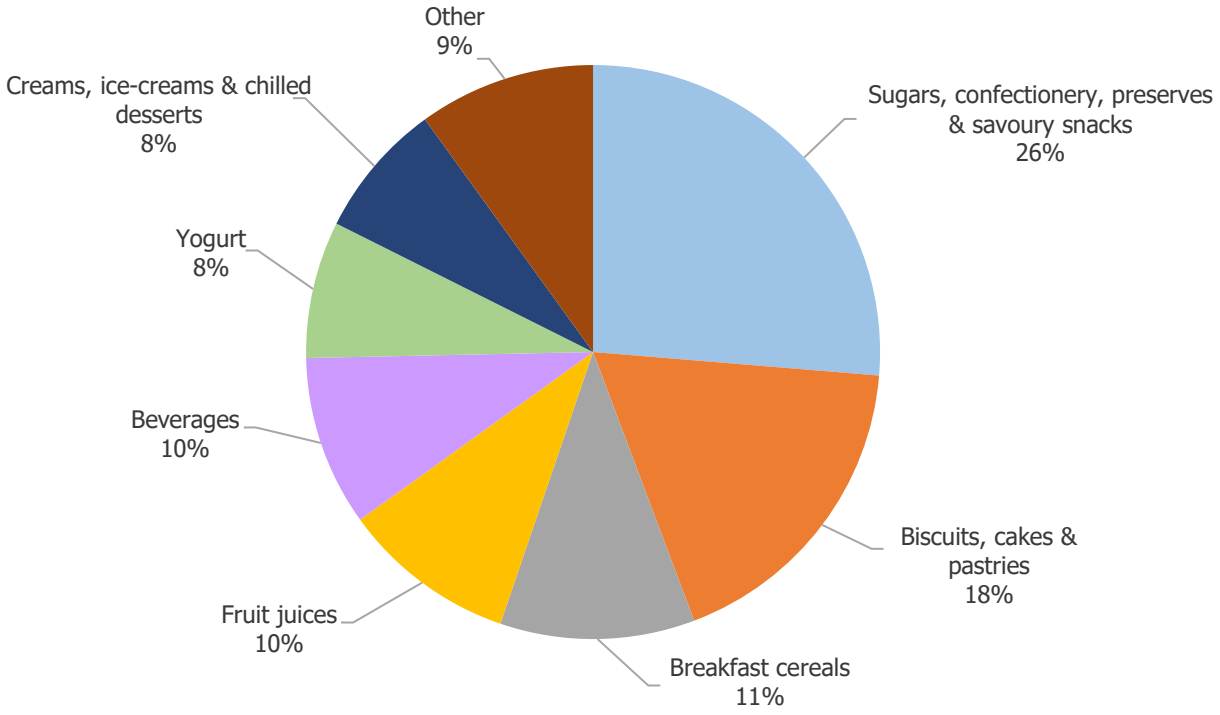

Figure 10. Sources of free sugars in Irish children aged 5-12 years

Dietary fibre

Dietary fibre plays a role in normal bowel function and is required in the diets of children to prevent constipation. The average daily intake of dietary fibre in Irish school-aged children was 14g **(Table 7)**. The main food sources of dietary fibre were bread and rolls (23%), breakfast cereals (15%), fruit and fruit juices (11%) grains, rice, pasta and savouries (10%) and vegetables and vegetable dishes (9%) **(Figure 11)**. While average dietary fibre intake was higher than that reported in the NCFS (2003-04) (12g), intakes are still below the adequate intake established by the EFSA (14-19g) for each age group examined.

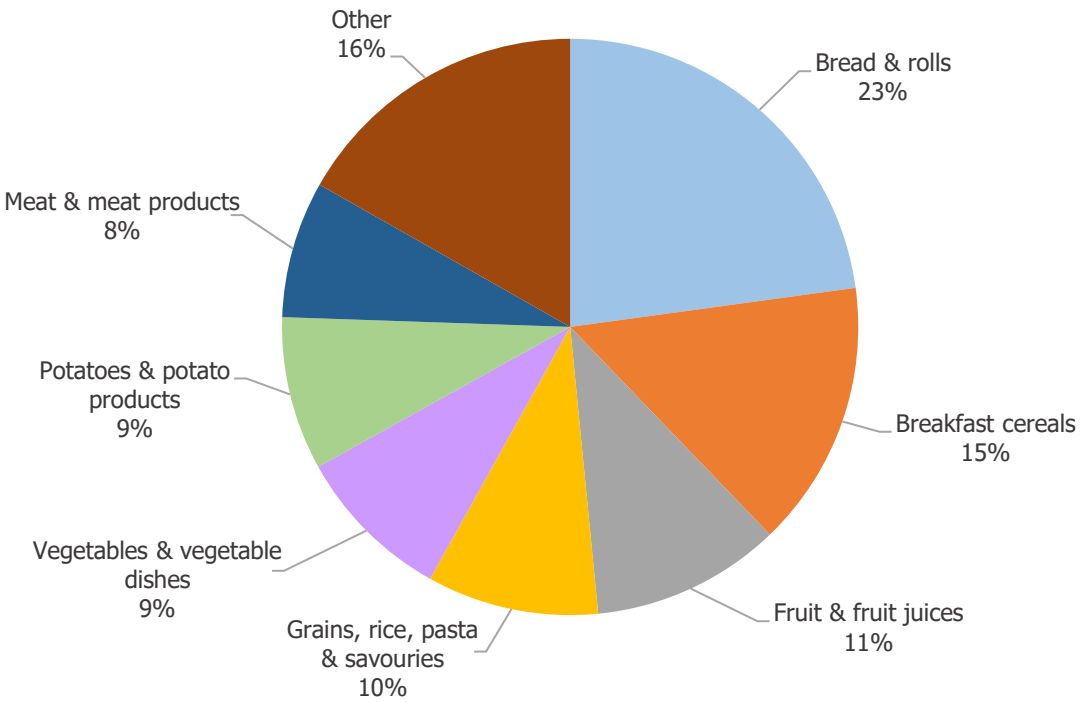

Figure 11. Sources of dietary fibre in Irish children aged 5-12 years

Salt

High intakes of dietary sodium (salt) are associated with increased blood pressure. Mean daily salt intake (estimated from urinary output) was 5g and exceeded target maximum daily levels for children set by the FSAI (3g for 5-6 year olds, 5g for 7-10 year olds and 6g for 11-12 year olds).

Salt intakes from food sources only (excluding discretionary salt i.e. that added in cooking or at the table) were estimated from food intake also. From these data, it was seen that salt intake is lower than in the NCFS (2003-04) (4g v 5g). This is partly attributable to salt reduction in foods (e.g. breakfast cereals).

The main dietary contributors to sodium intake in Irish children are shown in **Figure 12**. Meat and meat products contributed 24% of sodium intake, with 15% attributable to processed meats. Bread and rolls contributed 22%, with grains, pasta, rice and savouries (e.g. pizza) contributing a further 7%. This is similar to that reported in the NCFS (2003-04).

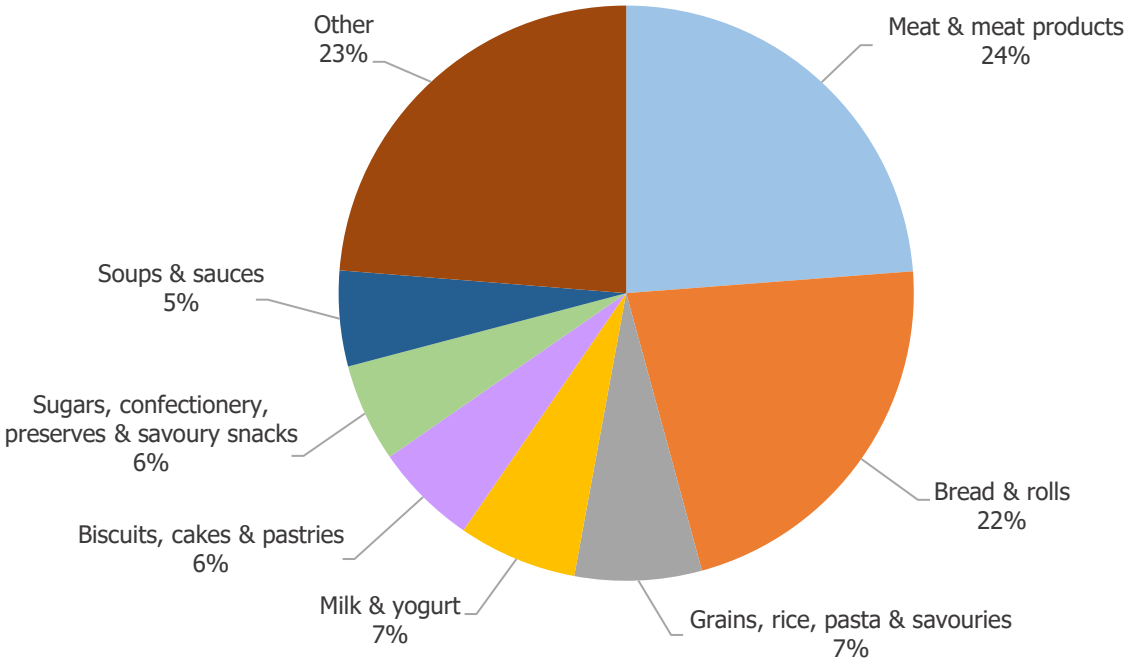

Figure 12. Sources of salt in Irish children aged 5-12 years

Vitamin and mineral intakes

Adequate micronutrient intakes during childhood are important for optimum growth and development. Mean intakes of selected vitamins and minerals in Irish children aged 5-12 years are reported in **Table 8** for the NCFS II (2017-18) and NCFS (2003-04). **Figures 13-16** show the main food contributors to intakes of vitamin D, folate, calcium and iron.

Intakes of most vitamins and minerals were adequate as indicated by the low percentage of children with intakes below the Estimated Average Requirement (EAR). However, a large proportion of Irish children have inadequate intakes of calcium (37%) and vitamin D (94%) which may impair the development of bone mass during this crucial period of growth. About 20% of children were estimated to have inadequate intakes of iron and 13% for folate.

Table 8. Mean daily intakes of vitamins and minerals in the NCFS II and NCFS

	NCFS II (2017-18) *(n = 600)*		**NCFS (2003-04)** *(n = 594)*	
	Mean	SD	Mean	SD
Vitamins				
Total Vitamin A (µg)	666	307	700	413
Retinol (µg)	292	146	347	237
Carotene (µg)	2397	1828	2130	1687
Vitamin D (µg)	4.2	3.1	2.5	1.8
Vitamin E (mg)	6.9	2.9	6.3	3.2
Thiamin (mg)	1.4	0.4	1.5	0.5
Riboflavin (mg)	1.6	0.6	1.8	0.8
Total Niacin Equivalents (mg)	28.8	7.5	28.5	7.8
Pantothenate (mg)	5.3	1.8	5.3	2.0
Biotin (µg)	25.3	11.2	24.8	12.9
Vitamin B6 (mg)	1.5	0.5	2.0	0.7
Vitamin B12 (µg)	4.6	1.8	4.4	1.9
Total Folate (µg)	211	65.3	224	82.2
Dietary Folate Equivalents (DFE) (µg)	253	96.6	268	109
Vitamin C (mg)	73.1	42.3	86.0	50.0
Minerals				
Sodium (mg)	1657	365	2081	506
Potassium (mg)	2019	486	2190	502
Calcium (mg)	791	241	862	264
Iron (mg)	9.0	2.4	9.4	3.0
Magnesium (mg)	194	47.2	194	47.0
Zinc (mg)	7.3	2.1	6.6	1.8
Copper (mg)	0.8	0.2	0.8	0.3
Phosphorous (mg)	1008	256	1024	258

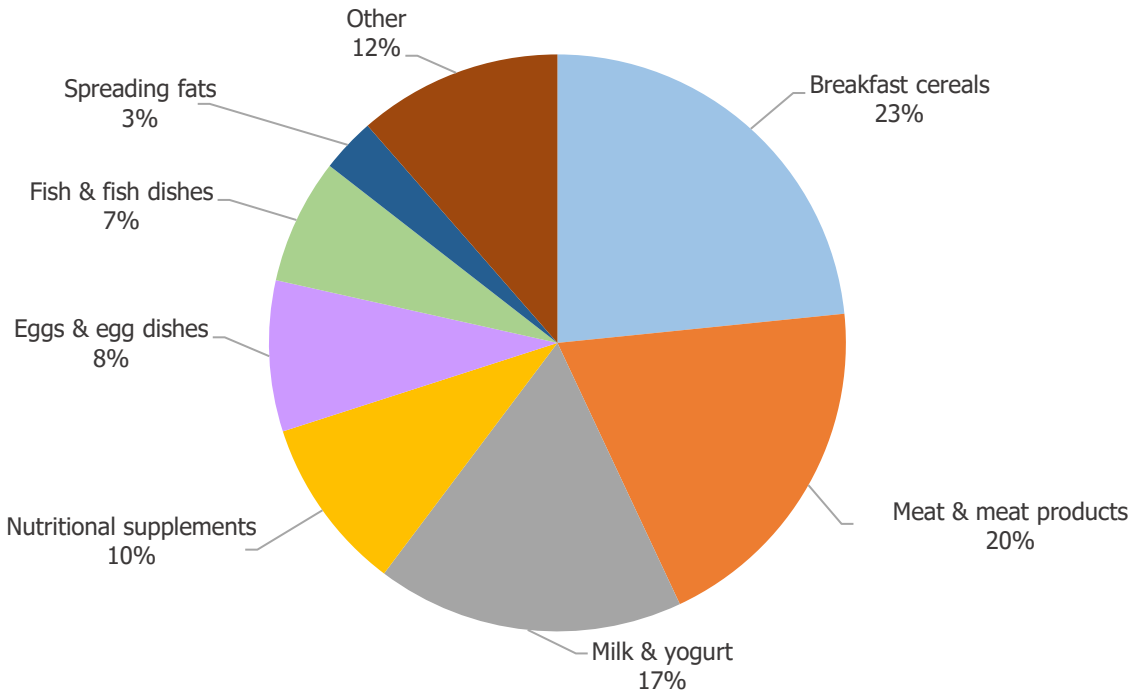

Figure 13. Sources of vitamin D in Irish children aged 5-12 years

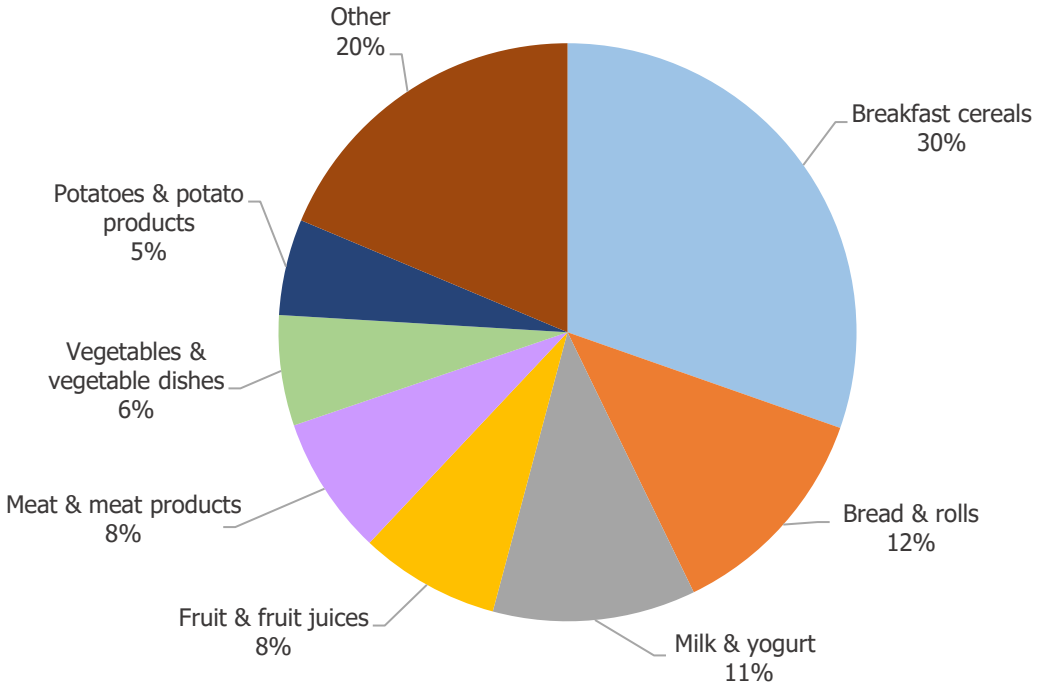

Figure 14. Sources of dietary folate equivalents (DFE) in Irish children aged 5-12 years

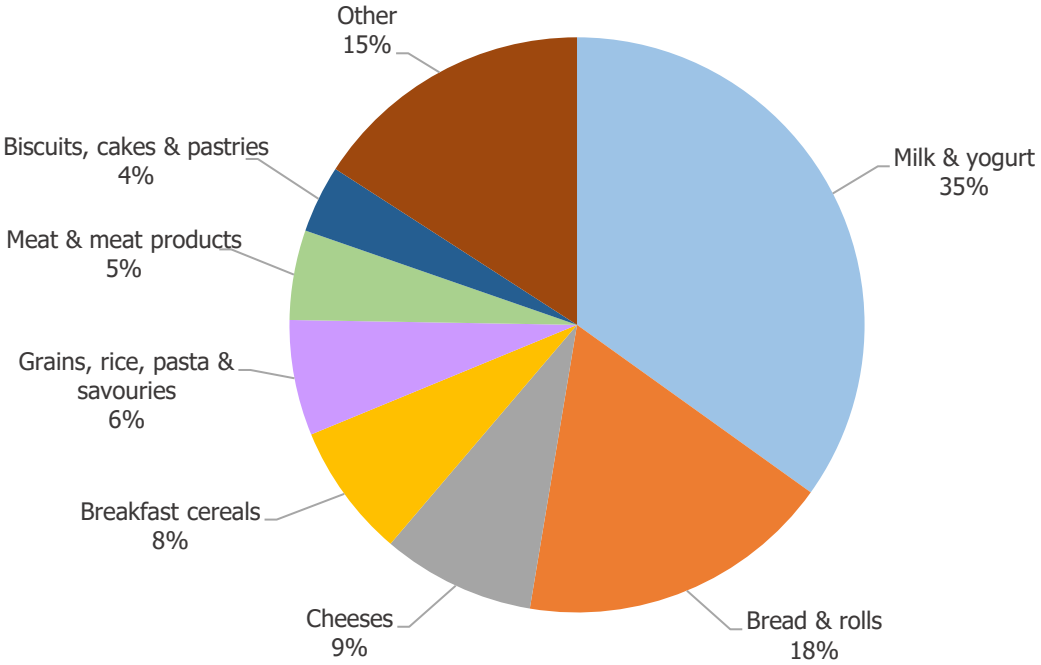

Figure 15. Sources of calcium in Irish children aged 5-12 years

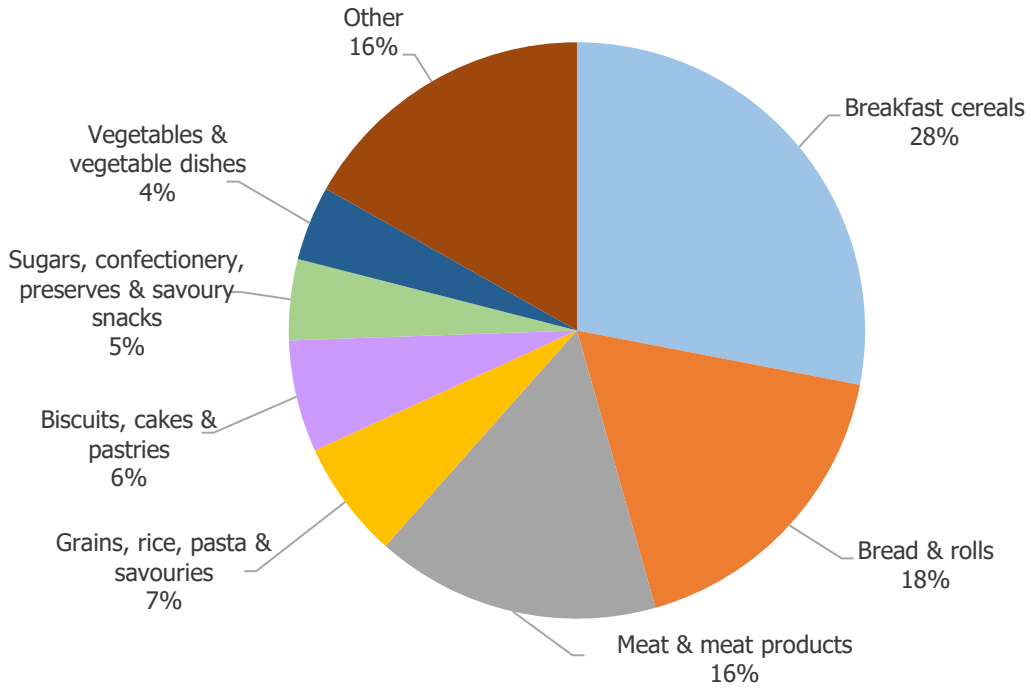

Figure 16. Sources of iron in Irish children aged 5-12 years

Chapter 3 Body weight and physical activity

Body weight

Anthropometric data including weight, height, waist circumference, hip circumference, % body fat and body mass index (BMI: body weight in kilograms divided by body height in metres squared) are shown in **Table 9.**

Table 10 presents the proportion of Irish children aged 5-12 years classified as overweight and obese using the International Obesity Task Force (IOTF) age-and-gender specific BMI cut-offs to define thinness, overweight and obesity. IOTF cut-offs are based on pooled international data for BMI and are linked to the widely accepted adult definitions. Overall, 78% of 5-12 year old children were classified as normal weight using the IOTF criteria, with 5% defined as thin and 16% (boys 14%, girls 19%) defined as overweight or obese. This prevalence of overweight and obesity is lower than that reported in the NCFS (2003-04) of 25% (boys 19%, girls 30%).

These data show that the prevalence of overweight and obesity in Irish children appears to have stabilised or decreased in recent years, especially in girls. However, current rates of childhood overweight and obesity in Ireland are still too high.

Table 9. Mean values for anthropometric measurements of Irish children aged 5-12 years in the NCFS II

	Total			**Boys**			**Girls**		
	n	Mean	SD	*n*	Mean	SD	*n*	Mean	SD
Weight (kg)	*596*	32.5	11.4	*298*	32.6	10.5	*298*	32.5	12.3
Height (cm)	*596*	134	14.7	*298*	135	14.7	*298*	134	14.8
BMI (kg/m^2)	*596*	17.5	3	*298*	17.5	2.7	*298*	17.5	3.3
% Body fat	*594*	20.4	6.4	*297*	18.9	6.1	*297*	22.1	6.4
Waist circumference (cm)	*591*	59.3	8.2	*296*	59.7	7.5	*295*	58.9	8.9
Hip circumference (cm)	*591*	71.4	9.9	*296*	71.4	9.1	*295*	71.4	10.6

Table 10. The prevalence (%) of overweight and obesity in Irish children aged 5-12 years as defined using IOTF cut-offs* in the NCFS II

	Total population *(n=596)*	**Boys** *(n=298)*	**Girls** *(n=298)*
	%		
Thin	5.3	3.3	7.3
Normal weight	78.3	82.8	73.6
Overweight and obese	16.4	13.9	19.2
of which			
Overweight	11.7	10.4	13.2
Obese	4.7	3.5	6.0

* Cole & Lobstein (2012) Extended international (IOTF) body mass index cut-offs for thinness, overweight and obesity. *Pediatric Obesity*, 7(4), p.284-294.

Physical Activity

National recommendations are that children should accumulate a minimum of 60 minutes per day of physical activity at a moderate to vigorous level. The accumulation of such physical activity is associated with fundamental health benefits such as the maintenance of normal weight, while conversely, time spent in sedentary behaviours, including screen usage, is associated with increased risk of overweight and obesity in young people.

Overall, average daily time engaged in physical activities was 81 minutes (84 minutes in boys, 79 minutes in girls). A total of 69% of children met the recommendation of 'at least 60 minutes' of physical activity per day **(Table 11)**.

The most popular sporting activity in boys was football (76%) and in girls running and jogging (58%). Children spent a median of 254 minutes per day in sedentary behaviours (girls 259 minutes, boys 250 minutes), with median screen time of 86 minutes (boys 111 minutes, girls 72 minutes).

Overall, participation of children in physical activities is relatively high and a high proportion of Irish children are meeting the physical activity recommendations. Children should be encouraged to reduce time spent in sedentary behaviours, including screen usage, to help maintain a healthy weight.

Table 11. Median time (min/d) spent participating in physical activity and sedentary behaviours in Irish children aged 5-12 years in the NCFS II

	Total population *(n=597)*	**Boys** *(n=299)*	**Girls** *(n=298)*
	Median (min/day)		
Physical activities	81	84	79
Sedentary behaviours	254	250	259
of which			
screen time	86	111	72

Chapter 4 Factors associated with children's eating behaviours

Introduction

The development of healthy eating behaviours during childhood is important as food habits formed in childhood tend to continue into adulthood. Children's dietary patterns and eating behaviours develop within the context of the family, where parents/guardians are primarily responsible for creating the home environment that can shape a child's eating behaviours for life.

The NCFS II examined parents' attitudes to providing a healthy diet for their child and the barriers they encounter, using self-reported questionnaires. Self-reported questionnaires were also used to assess levels of food fussiness in children.

Perceived barriers to providing a healthy diet

Overall, 78% of parents felt that what their child was eating could be healthier. Those parents who felt that their child could be eating healthier also reported children with higher levels of fussy eating.

When asked 'Is it difficult to provide a healthy diet for your child?', the majority of parents (70%) answered either 'yes' or 'sometimes'. A higher proportion of parents of younger children (5-8 years) (75%) reported that they found it difficult to provide a healthy diet compared with parents of older children (9-12 years) (65%) **(Figure 17)**.

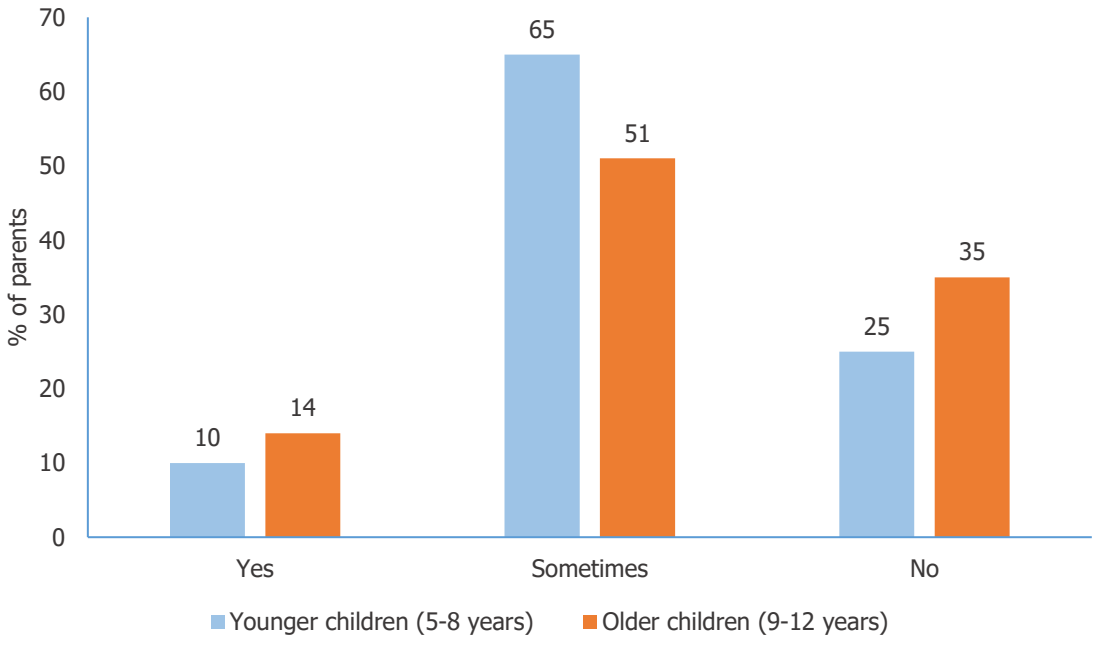

Figure 17. Parents' opinions on whether it is difficult to provide a healthy diet for their child

The main barriers perceived by parents to providing a healthy diet for the child were the child's likes/dislikes (64% of parents), convenience (40%), other people minding the child (39%) and food advertising (34%) **(Figure 18)**. There was little difference in the responses provided by parents of younger and older children. Parents who agreed that their child's likes/dislikes makes it difficult for them to provide a healthy diet also reported children with higher levels of fussy eating in their child. Levels of fussy eating were not associated with any of the other factors examined.

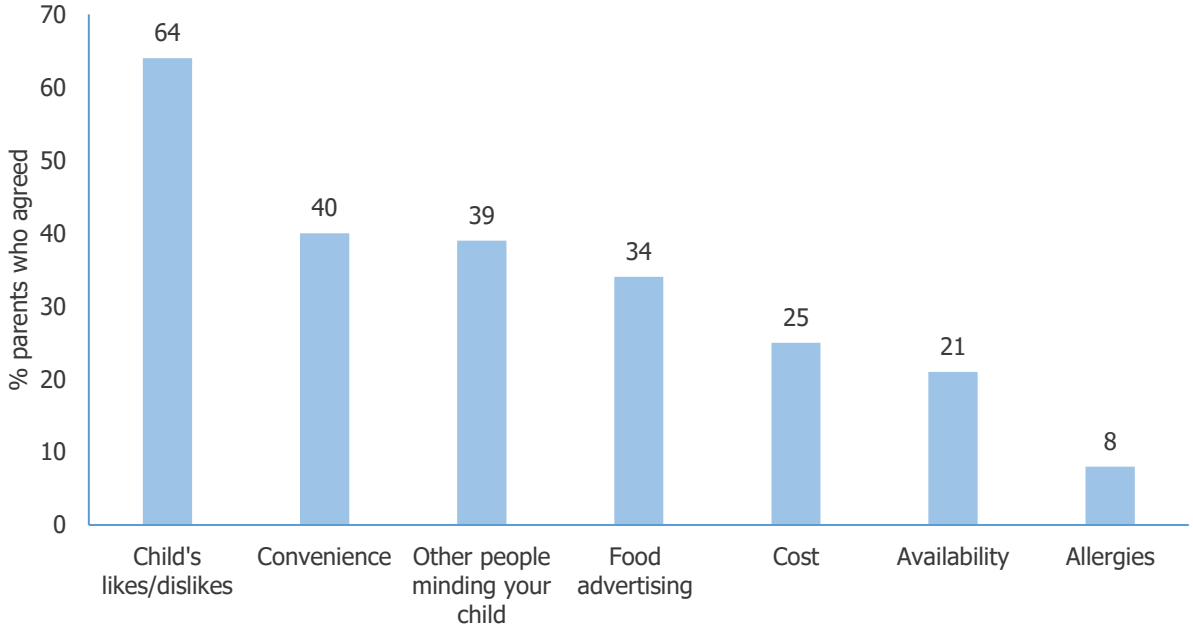

Figure 18. Factors that make it difficult for parents to provide a healthy diet

Notes

Ammendments

30th September 2019:

Table 7: Fat values for NCFS (2003-04) amended

20th May 2020:

Table 1: SD value for consumers only for low-fibre cereals for NCFS II (2017-18) amended

Table 1: Mean value for consumers only for other savouries for NCFS II (2017-18) amended

Table 3: % consumers for processed meat for NCFS (2003-04) amended

Table 4: Mean and SD values for total population and consumers only for total fruit & vegetables, fruit & fruit juices, total vegetables, and vegetables in composite dishes for NCFS II (2017-18) amended

Table 6: SD value for consumers only for water for NCFS II (2017-18) amended

Table 6: Mean, SD and % consumers values for soft drinks (no added sugar and added sugar) for NCFS II (2017-18) amended

Figure 7: % contribution from 'milk & yogurt' and 'other' amended

Figure 8: % contribution from 'sugars, confectionery, preserves & savoury snacks' and 'other' amended

Figure 9: % contribution from 'bread & rolls', 'breakfast cereals' and 'biscuits, cakes & pastries' amended

Figure 10: % contribution from 'beverages' and 'other' amended

Figure 11: % contribution from 'grains, rice, pasta & savouries', 'potatoes & potato products' and 'other' amended

Figure 12: % contribution from 'sugars, confectionery, preserves & savoury snacks' and 'other' amended

Figure 13: % contribution from 'eggs & egg dishes' and 'other' amended

Figure 14: % contribution from 'bread & rolls' and 'other' amended

Figure 15: % contribution from 'breakfast cereals' and 'other' amended

Figure 16: % contribution from 'sugars, confectionery, preserves & savoury snacks' and 'other' amended

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