

What's on your child's plate?



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Food portion sizes and the proportion of different food groups eaten by children on the island of Ireland

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Foreword

The portion size and the proportion of servings from the different food groups recommended for childrens' meals depends on their age and stage. This research was commissioned by **safefood** to:

- Provide insight into how and why parents estimate portion sizes; and
- Provide insight into the proportion of different foods given at routine meals in the home and in school in comparison to those recommended by dietary guidelines.

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Table of Contents

1	Key findings.....	1
	What are the key factors that influence the way that parents portion food for their children?	1
	What are parents' views on portion size guidance?	1
	What and how much are children on the island of Ireland eating?	2
2	Introduction	3
	The burden of childhood overweight and obesity.....	3
	Expanding portion sizes in society	3
	Official guidance on child portion sizes in Ireland.....	4
3	Aims and objectives.....	7
4	Methods.....	8
	Plating up appropriate portion sizes for children: a systematic review of parental food and beverage portioning practices	8
	Childrens' food and beverage portion sizes on the island of Ireland: a qualitative study of parents' views and practices	11
	Children's food and beverage portion sizes on the island of Ireland: a secondary analysis of the Cork Children's Lifestyle Study (CCLaS) and the National Diet and Nutrition Survey (NDNS)	12
5	Results.....	15
	Plating up appropriate portion sizes for children: a systematic review of parental food and beverage portioning practices	15
	Food and beverage portion sizes of children: a qualitative study of the views and practices of parents on the island of Ireland.....	21
	Children's food and beverage portion sizes on the island of Ireland: a secondary analysis of the Cork Children's Lifestyle Study (CCLaS) and the National Diet and Nutrition Survey (NDNS)	42
6	Discussion.....	57
	What are the key influencing factors on parental portioning practices?	57
	What are parent's views on portioning size guidance?.....	58

	What and how much are children eating on the island of Ireland?	59
7	Conclusions and recommendations	61
	Recommendations	61
8	References.....	63
9	Appendices	68
	Appendix 1: Qualitative Study Recruitment Procedures	68
	Appendix 2: Focus group discussion guide	73
	Appendix 3: Snack Portion Sizes.....	77

1 Key findings

What are the key factors that influence the way that parents portion food for their children?

- Parents generally serve a set amount of food to their children rather than permitting children to self-serve.
- Few parents in this research involved children in cooking, choosing or serving portions.
- Parents' main concern regarding the amount that they feed their children is to ensure that they are fed a sufficient amount i.e. more concerned about avoiding underfeeding than overfeeding.
- Parents base portion sizes on each child's individual appetite and through learning from experience how much the child will eat.
- Parents' often portion out these learned amounts of food on smaller sized plates which help them to control the amount that they are serving.
- Parents use their child's body size as an indicator that their child is healthy and that the portion sizes that they provide are appropriate.
- As parents want to encourage their children to eat a healthy diet, they allow larger amounts of foods perceived to be healthy and give smaller amounts of foods perceived to be less healthy.
- Family influences on portion size were apparent: male spouses and grandparents regularly serve food to their children and serve larger portion sizes than mothers would serve.
- When buying pre-packaged foods in the supermarket, parents are influenced to buy larger portion sizes as they are sold at a lower cost.

What are parents' views on portion size guidance?

- Parents felt that they know how much food that their children need. They did, however, feel that portion size guidance would be useful to use as a gauge and to reassure them that they are not under- or over-feeding their child.
- Information could be presented pictorially on child sized plates as several parents serve their children food on child sized plates. Guidance could include household measures rather than weights as parents highlighted that this would be more practical.

- Parents felt that guidance would be most useful when their child starts pre-school, as at this stage it becomes less clear how much to feed them. It was apparent that first-time parents would be most receptive to this information.
- Parents suggested that it would be beneficial to target children themselves with portion size guidance through school but felt strongly that information should be presented in a positive way, focusing on health rather than body size and image.

What and how much are children on the island of Ireland eating?

- Across all eating occasions, boys consumed higher quantities of food than girls, however the relative proportions of the different food groups were broadly similar.
- The evening meal was the eating occasion where the highest quantity of food was consumed whereas lunch tended to be the smallest meal consumed for boys and girls in ROI. The quantities of food consumed at each eating occasion were, on average, more evenly distributed across the day in NI.
- Almost one quarter of all meals included foods and drinks high in fats sugar and salt, not recommended as part of a healthy diet.
- Afternoon and evening snacks included between 21% and 29%% of foods high in fats sugar and salt, in ROI and 23% and 37% in NI.
- Snacks consumed in the mornings were generally healthier, primarily based on fruit and veg in ROI and fruit and veg and dairy in NI. However, afternoon and evening snacks comprised a higher proportion of foods and drinks high in fat, sugar and salt in both NI and ROI as well as dairy foods for NI participants.
- Overall the majority of participants consumed their evening meal at home on weekdays (85% and 91%) for ROI and NI participants, respectively. These proportions decreased at weekend days (77% and 83%).
- The median portion size of food and drinks eaten outside the home was larger in both NI and ROI. The proportion of protein foods and high fat sugar salt foods was also large.
- The top food groups consumed were foods and drinks high in fat, sugar and salt and dairy products in NI; the top food groups consumed in the ROI were cereals, breads, potatoes, pasta and rice, foods and drinks high in fat, sugar and salt and dairy products; this is out of line with the healthy eating guidelines in both NI and the ROI which recommend that the largest proportion of the diet should come from the fruit and vegetables and starchy carbohydrates food groups.

2 Introduction

The burden of childhood overweight and obesity

Childhood obesity remains a global health issue with around one-quarter of children in the developed world classified as overweight or obese (1). On the island of Ireland, the extent of the problem is similar, with around one-in-five children in the Republic of Ireland (ROI) classified as overweight or obese in 2011-12 and one-in-four children in Northern Ireland (NI) in 2015-16 (2-4). While there is evidence that rates of overweight and obesity in children have plateaued, the overall prevalence remains high (2, 4). The health impacts of childhood overweight and obesity have been thoroughly documented. It is well established that overweight and obesity in childhood increases the risk of psychological and respiratory health problems in the short-term, and, as this condition often persists into adulthood, risks of premature mortality and morbidities, particularly cardio-metabolic related morbidities, are increased in the long-term (5-8). Recent economic analyses for the island of Ireland show approximately 3% of healthcare expenditure is attributable to childhood obesity, primarily due to the tracking of obesity in childhood into adulthood when obesity-related mortality and morbidities increase and ensuing societal costs of absenteeism, premature death and lifetime income losses materialise (3).

Expanding portion sizes in society

Portion sizes of commercially available foods and beverages have increased since the 1980s (9-11), as have portion sizes consumed by children (12, 13). Children's consumption of larger portion sizes is associated with higher energy intakes and weight status (14-16). In experimental settings, doubling the portion size served to a child increases the volume consumed by approximately 20% (17-20). The energy-density of the food or beverage has both independent and additive effects to this 'portion size effect' (21, 22). Thus, children will consume the most dietary energy from larger portion sizes of energy-dense foods or beverages. There may also be little compensation for this additional energy consumed later in the day (23). Observational studies confirm that children's consumption of larger portion sizes is associated with both higher energy intakes and increased weight status (14-16, 24). Studies using doubly labelled water have also shown that high body weight in children is determined by a high energy intake (as opposed to a scenario of low physical activity combined with a low energy intake) (25).

Parents and guardians act as critical role models for children in the development of eating habits and often decide the amounts (portion sizes) their children are served (26-28). How parents portion foods and beverages, and how they decide the amounts to serve is an understudied domain (26, 29). In a recent review of parental portioning practices, researchers concluded that parents serve their children the portion sizes they have learned to be appropriate for their individual child to be fed (30). Portion sizes served by parents are influenced by overall feeding goals of having a healthy child with a balanced diet, but also by child body size, hunger and amounts parents serve themselves (30). Children's portion sizes, thus presents a clear, modifiable determinant of excess energy consumption in children and risk of weight gain (31).

Official guidance on child portion sizes in Ireland

National Food Based Dietary Guidelines on the island of Ireland include the *Food Pyramid* (Figure 1) in ROI and the *Eatwell Guide* (Figure 2) in NI (32, 33). The *Food Pyramid* provides recommendations on serving sizes (amounts to consume) and the number of daily servings to be consumed from each food group for children aged 5 years and older. The *Eatwell Guide* in NI however, does not provide recommendations on serving sizes or number of daily servings apart from 'at least 5 portions of a variety of fruit and vegetables a day' and 'eat 2 portions a week (of fish), 1 of which should be oily'. Note here the inter-changeable usage of serving size and portion size across these food-based dietary guidelines.

Figure 1: Healthy Food for Life - The Healthy Eating Guidelines and Food Pyramid

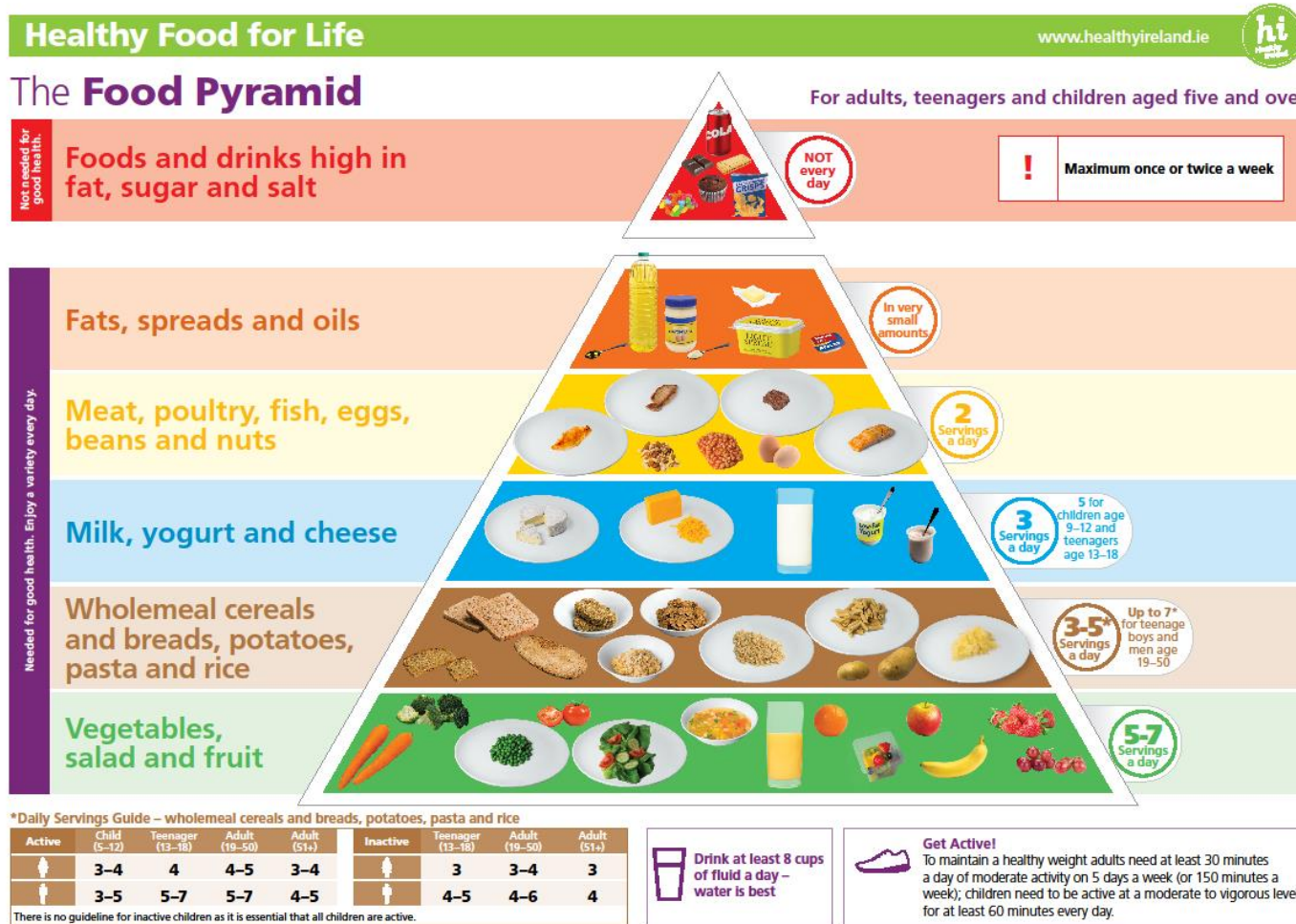
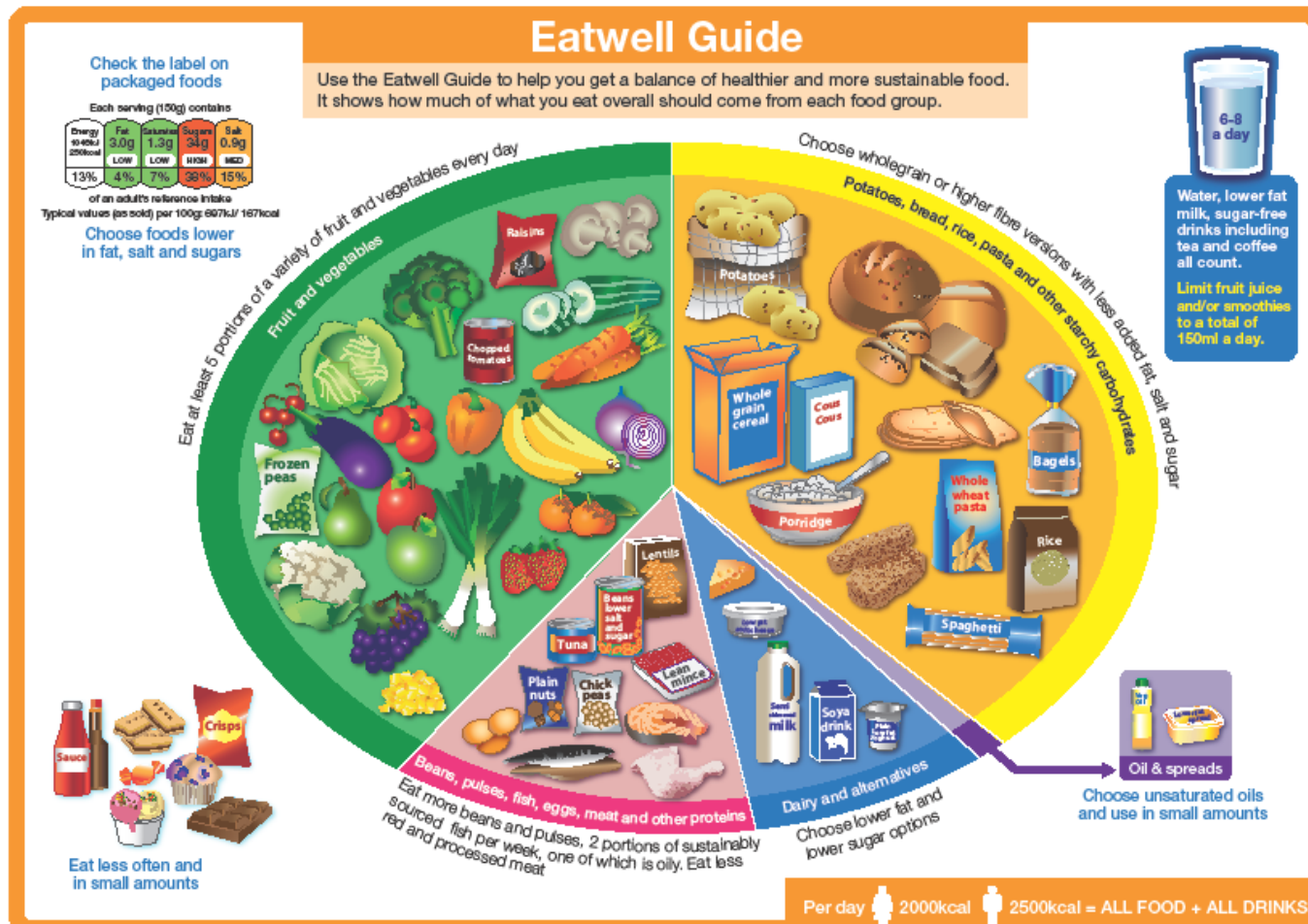


Figure 2: Eatwell Guide



Source: Public Health England in association with the Welsh Government, Food Standards Scotland and the Food Standards Agency in Northern Ireland

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3 Aims and objectives

The research aimed to:

- review the existing literature of the factors that influence the way parents portion food for their children.
- understand parents' practices in portioning food and beverages for their children; their mechanisms for judging appropriate portion sizes and the factors influencing these judgements.
- estimate the proportion of different food groups served to children on the island of Ireland at each meal occasion on a daily basis.

4 Methods

An overview of the methods used in the research is presented here. Full details available in Appendices 1-3.

Plating up appropriate portion sizes for children: a systematic review of parental food and beverage portioning practices

The literature on ‘parental portioning practices’ was synthesized using a mixed methods systematic design. The inclusion/exclusion criteria according to the SPIDER Framework were applied Table 1 (34). The findings from the review informed the development of the topic guide for the qualitative focus groups with parents.

Table 1: Inclusion and Exclusion criteria applied to literature review

Criteria (SPIDER)	Inclusion	Exclusion	Explanation/Elaboration
Sample	Parents with at least one child aged 2 – 12 years ^a , residing in developed countries.	Parents of children with acute or chronic illness.	Residing countries were restricted to ‘very high’ Human Development Index (i.e. $HDI \geq 80$) ^b , as findings will inform future public health guidance in the Republic of Ireland and Northern Ireland and parental portioning practices would likely be influenced by the broader health and economic context of a society. Children with acute or chronic illness may require medical nutrition therapy as part of their treatment and/or management that may influence the amounts of foods or beverages parents portion for their child.
Phenomenon of Interest	Parental portioning of foods or beverages for their child.	n/a	Parental portioning refers to how parents portion foods and beverages for their child including amounts parents serve and amounts parents make available to children from which they may serve themselves.
Design	None.	Post-test data from experimental studies.	Post-test data from experimental studies aimed at modifying parental practices were excluded, as this review aimed to understand existing practices.

Evaluation	Practices (and factors influencing these practices, e.g. opinions, knowledge).	None.	Factors influencing practices included a) measured indicators demonstrated to modify parents' portioning practices and, b) factors parents themselves identified as influencing their practices. Examples included parental knowledge, attitudes or opinions on child portion size, or demographic, socioeconomic or anthropometric characteristics of the parent or child.
Research type	Quantitative, qualitative and mixed methods research.	None.	
Other: article type	Peer-reviewed original research articles and reviews.	Articles without or with limited results, e.g. conference abstracts, editorials or commentaries	Reported results were required to synthesize the evidence. In scoping searches, all relevant articles identified were published in peer-reviewed journals.
Other: language	English	n/a	In scoping searches, we found no relevant articles published in languages other than English.

Childrens' food and beverage portion sizes on the island of Ireland: a qualitative study of parents' views and practices

The primary aim of this *qualitative* study, was to understand parents' *practices* in portioning food and beverages for their children; their mechanisms for judging appropriate portion sizes and the factors influencing these judgements. The secondary aim was to understand parents' *views* regarding appropriate portion sizes for children and on future portion size guidance material, including preferences for content, format and delivery modes. Specifically, the research questions were:

- How do parents portion foods and beverages for children and what influences this portioning *practice*?
- What are parents' *views* on the portion sizes of foods and beverages served to children and their views on receiving guidance on appropriate portion sizes to serve children?

Sample selection

Eligibility criteria were parents or guardians (herein referred to as 'parents') with at least one child aged 2–12 years who did not require a diet on medical grounds (e.g. diabetes, severe food allergy). Recruitment was undertaken using a purposive sample of preschools and primary schools geographically located in either urban or rural areas of Northern Ireland and the Republic of Ireland, and classified as either higher or lower levels of disadvantage (or deprivation) (Table 2). Purposive sampling is a technique where the researcher relies on their own judgment when choosing members of population to participate in the study based on characteristics of a population and the objective of the study.

Urban schools were located in Belfast city and the greater Belfast area (NI) and Cork city (ROI), while rural schools were located within rural areas of counties Antrim and Down (NI) and Galway (ROI). Level of disadvantage was based on the school's eligibility to receive government support. In ROI, schools of higher disadvantage were those participating in the *Delivering Equality of Opportunity in Schools (DEIS)* program and linked or nearby preschools. School eligibility for the DEIS program are those located in a geographic area of greater deprivation according to the Haase Pratschke (HP) deprivation index – a measure derived from national census indicators for population demography, employment, occupation and family structure⁽³⁵⁾. In NI, schools of higher disadvantage were those with a higher proportion of children entitled to free school meals and geographically located within an area of greater deprivation according to the Northern Ireland Multiple Deprivation Measure (NIMDM) – a measure derived from national census indicators for population income, employment, health deprivation and disability, education, proximity to services, living environment, crime and disorder

(36). Details of the recruitment procedures and focus group guides are provided in Appendix 1 and Appendix 2.

Table 2: Purposive sample structure of selected schools for focus groups

Geographic location	Disadvantage Level					
	High			Low		
Urban	Primary schools	Pre-schools	Parents	Primary schools	Pre-schools	Parents
Cork city (43)	3	0	27	1	1	11
Belfast city and greater Belfast (18)	1	0	6	2	1	8
Rural						
Galway county (64)	3	0	41	3	2	15
Counties Antrim and Down (42)	3	1	12	1	1	24
TOTAL	10	1	86	7	5	58

Children’s food and beverage portion sizes on the island of Ireland: a secondary analysis of the Cork Children’s Lifestyle Study (CCLaS) and the National Diet and Nutrition Survey (NDNS)

This secondary analysis of dietary data for the population on the island of Ireland aimed to identify the portion sizes of foods and beverages consumed by children at main meals (breakfast, lunch and evening meals) and as snacks in terms of:

- Total quantities (grams) consumed, and
- Proportional contribution to food groups presented in national food based dietary guidelines i.e. Food Pyramid and Eatwell Guide.

Two cross-sectional population dietary datasets were sourced. The datasets were the most recent studies from which the data were publically available and accessible to the research team:

1. The Cork Children’s Lifestyle Study (CCLaS): CCLaS was a survey of N=1075 children aged 8–11 years and their parents. Children were recruited from N=27 primary schools across Cork City (urban) and Mitchelstown (rural) with data collected continuously between April 2012 and

June 2013. Surveyed children self-reported their dietary intake in a three-day estimated food diary, with assistance from parents. Portion size estimation was aided by food atlas photographs (i.e. standardised food and beverage portion size photos). In their food diaries, children recorded all foods and beverages consumed at main meals (breakfast, lunch and evening meals) and as snacks (morning, afternoon and evening snacks), as well as time and location of consumption.

2. The National Diet and Nutrition Survey – Northern Ireland cohort (NDNS): NDNS is a national nutrition monitoring program of the United Kingdom population aged 1.5 years and older. The NI cohort surveyed N=512 children aged 1.5 to 18 years across years 1-4 of the program, for which, data were collected in 2008/09 (Year 1) through to 2011/12 (Year 4). Dietary intake was recorded in a four-day estimated food diary by parents of children aged 1.5 to 12 years, or self-reported by children aged 12 years and older. Children (or parents) recorded all foods and beverages consumed, as well as time and location of consumption. Time was later categorised into meal time used for CCLaS eating occasions for comparability (i.e. breakfast: 6am to 8:59am, morning snack: 9am to 11:59am, lunch: 12 noon to 1:59pm, afternoon snack: 2pm to 4:59pm, evening meal: 5pm to 7:59pm, and evening snack: 8pm to 5:59am). Portion sizes were estimated using household measures, glass or cup sizes, or weights from package labels. Food atlas photographs were also used when reviewing food diary records to improve accuracy of portion size estimations.

Details on the methods of the two dietary datasets used in this analysis – *CCLaS* (ROI) and *NDNS* (NI) are published elsewhere (37),(38). The findings from the analyses of these datasets will be referred to as ROI (*CCLaS*) and NI (*NDNS*) data.

A number of participants were excluded: those with less than three days of food diaries recorded, those who under-reported dietary intake, and those who reported following a special diet and/or had a diet-related medical condition at the time of data collection. Data were then transformed and analysed in SPSS version 24 (IBM Corp., NY, USA). Both dietary datasets were aggregated (collapsed) in two stages:

1. Total quantities (grams) consumed in total, from each food and beverage category, and from each *Food Pyramid* or *Eatwell Guide* food group were summed for each main meal and snacks, for each food diary day, for each child. Total quantities (grams) of each *Food Pyramid* or *Eatwell Guide* food group were also calculated as a proportion of total grams consumed at each main meal and snack, to provide the proportional contribution of meals and snacks to food groups.
2. Total quantities (grams) consumed in total, from each food and beverage category, and from each *Food Pyramid* or *Eatwell Guide* food group were then averaged across food diary days, to provide the average portion size consumed by a child at each main meal and snacks.

Proportional contributions of main meals and snacks to food groups were then also averaged across food diary days.

As the majority of data were skewed (i.e. consumed portion sizes tended to cluster at a particular portion size with other portion sizes being at the higher or lower end) medians (with associated interquartile ranges) for average portion sizes consumed (in grams) and proportional contributions to *Food Pyramid* or *Eatwell Guide* food groups are reported.

5 Results

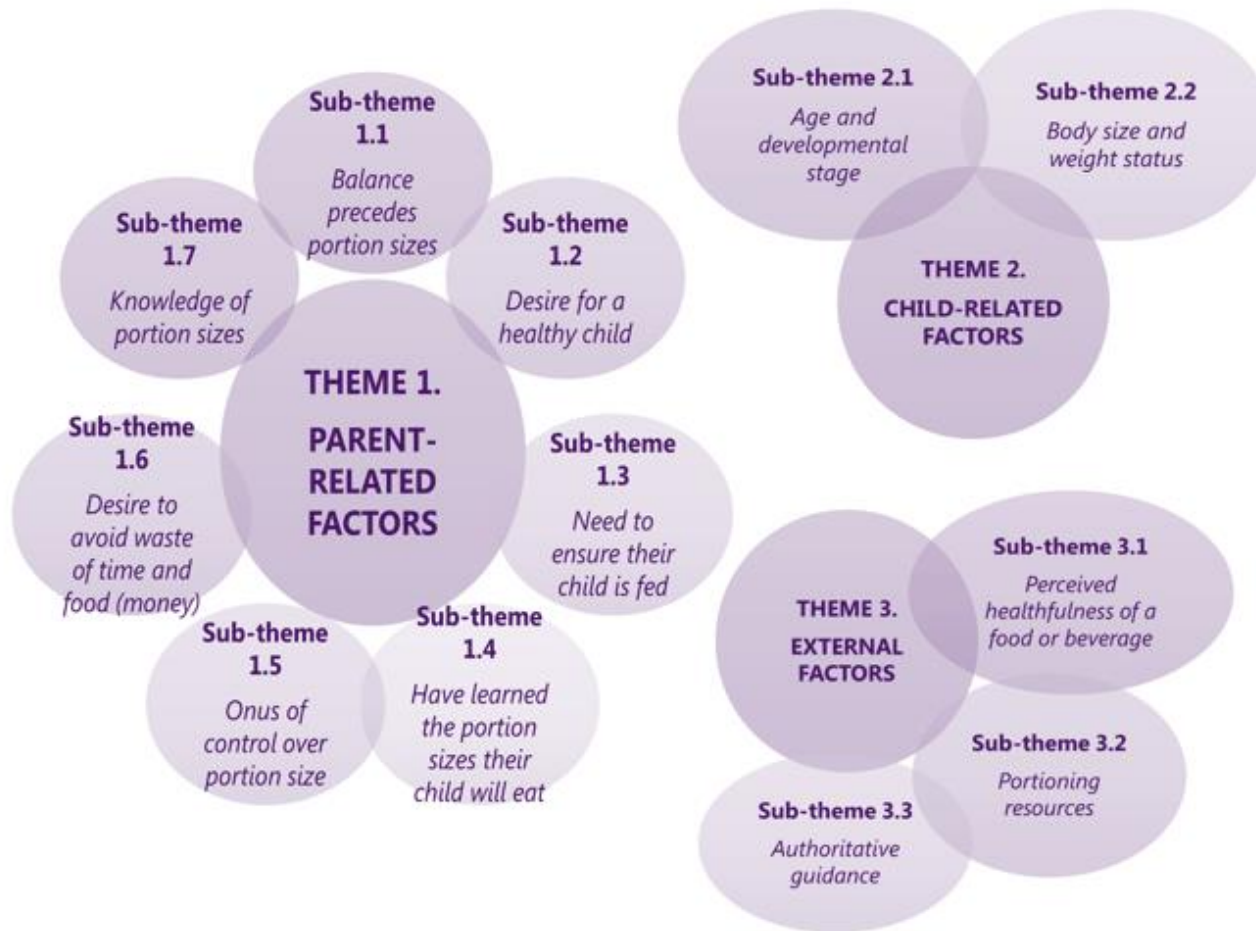
Plating up appropriate portion sizes for children: a systematic review of parental food and beverage portioning practices

‘Parental portioning practices’ were framed in the literature as how parents decide the portion served. Thematic synthesis of 14 qualitative studies found parents serve the portion sizes they learn to be appropriate for their child to be fed. Portioning is influenced by parents’ desires for a healthy child with a balanced diet. The studies were primarily based in the US (11/14) with the remaining 3 studies based in the UK.

Through thematic synthesis, three broad themes were defined (Figure 3):

1. Parent-related factors (seven sub-themes);
2. Child-related factors (two sub-themes);
3. External factors (three sub-themes)

Figure 3 Summary of themes identified in the qualitative synthesis.



Parent-related factors

Sub-theme 1.1. Balance precedes portion size

Parents identified a balanced intake of food groups as a primary child feeding goal (39-44) and portion size was of lesser concern to parents than this balance at meals (40, 42). *“The meal must have proteins, chicken or fish ... or from time to time meat. Yes, that’s important for me, to have proteins, so the meal is balanced, as balanced as possible.”* (44). *“It is about combinations for me, so portion size is not that much of an issue.”*

Sub-theme 1.2. Desire for a healthy child (of a healthy weight)

Parents wanted their child to be a healthy or ‘normal’ weight, as this indicated their child was healthy (39, 45, 46). *‘Mothers were focused on what they perceived as healthy growth for their child. “It’s really important [to gain the right amount of weight] because that way I know whether she is healthy or not.”’* (41)

Further, parents of young children (aged 2–5 years) expressed desire for their child to be slightly overweight to prevent ill-health (42, 46). *‘...having a ‘chubby’ child was viewed as a positive thing by many; needing ‘a little bit of extra padding’ to cope with active play, illness and ‘growth spurts.’* (46). However, parents also expressed desire to prevent too much weight gain and would restrict portion sizes if believed in the child’s best interest *“I just don’t want them to eat too much or gain weight then there will be a health problem to deal with”.*’ (39).

Sub-theme 1.3. Need to ensure their child is fed

Parents in five studies (39), (41-44) expressed a need to ensure their child was fed as they perceived this to be their role as a parent (*“My role...is to try and make sure that they have a well-balanced meal...as long as there’s like a vegetable, some bread, definitely milk and meat...that’s like the most important thing to have as many food groups as possible. And then to try and make sure that they eat at least enough where I feel that they’re fed. Like I’ll say, ‘Are you full now?’ And I want to make sure because that’s just my job”.*’ (39). Parents in three studies (39),(41, 46), reported feeling happy to see their child eating ‘enough’, particularly of the types of foods they wanted them eating (*“I would feel really happy if he ate this because I would see him as eating good...Enough [of the] portions that I would want him to eat”.*’ (41). Parents in four studies (39),(41-43) served their children the types and amounts of foods they liked to ensure they ate. The notion of restricting food from a hungry child to prevent weight gain created anxiety among parents (39, 46) (*‘The dilemma mothers seemed to face was their concern not to ‘give in’[to food demanded outside mealtimes], causing their child to put on too much weight, yet...fearing that their child might genuinely need the extra nourishment...’*(46)

Parents in one study however, described limiting food outside of meal times to avoid children developing a habit of snacking (44).

Sub-theme 1.4. Have learned the portion sizes their child will eat

Parents in four studies (40, 41, 43, 47) stated they simply knew the portion sizes their child would eat. This understanding of their child's ideal portion sizes developed over time with experience of their child's eating patterns '*Many mothers asserted that the amounts they served were based on knowing their child and knowing what the "right amount" for their child was because of their long-time experience with feeding their child.*'(41). In deciding portion sizes to serve, this understanding was contextualized with in-the-moment factors such as time since the child last ate, prior intake that day, usual eating routine, expressions of hunger, and physical state (i.e. parents knew a tired or unwell child would eat less)(40, 41, 43, 47, 48). Parents in two studies(40, 46) interpreted their child's ideal portion sizes as highly individual from comparison to other children or siblings' consumed portion sizes '*There was a widespread belief that all children are different and that the right amount for one particular child would be too much or too little for another.*' (40)).

Sub-theme 1.5. Onus of control over portion size

Parents in six studies (39-42, 47, 48)) allowed their child to self-regulate their intake at meals. In these studies, the child was also permitted autonomy to decide their own portion size ("*I don't decide the amount until she tells me, 'Okay', she doesn't want any more.*".'(48)). Other parents interpreted their child's expression of satiety to mean something else (e.g. '*wanting to do something else*') and encouraged their child to continue eating (41, 43). Alternatively, parents negotiated portion sizes with their child (40, 44, 47-49). ("*Last night when I put their food on their plates she said: oh, you haven't given me enough. I said you can have one more piece of chicken but you're not having anything else.*".'(40).

Sub-theme 1.6. Desire to avoid waste of time and food (money)

Parents in three studies (39, 41, 42) wanted their child to eat what they viewed a reasonable amount of their evening meal to avoid wasting food (and therefore money), as well as their time preparing uneaten food. Further, there was evidence from one study that parents believed they would overfeed (or over-portion) a child to avoid wasting food prepared in surplus ("*So if you've over cooked, you will overfeed...I don't like to throw it in the bin so it goes on the plate.*".'(45)).

Sub-theme 1.7. Knowledge of portion sizes

Parents in four studies (40, 42, 45, 46) expressed limited knowledge of appropriate portion sizes for children and themselves ("*...I find it particularly difficult dishing out the correct portion size for*

children and for adults, I suppose. I just tend to give everybody the same amount”.’(45). Parents in three studies (39, 42, 45) referred to a child portion as smaller than an adult portion, with one specific portioning strategy being ‘cutting adult portions in half’(42). Parents in three studies (44, 48, 49) defined a snack as ‘something small’ or a ‘small portion of food’.

Child-related factors

Sub-theme 2.1. Age and developmental stage

Parents in four studies (39, 40, 42, 46) described portion sizes as needing to increase as a child grows older and for developmental ‘growth spurts’(“...she eats way smaller than the older two because she is younger. I feed her smaller amounts too because she is younger and doesn’t need as much [as] them [older siblings]”).(39). Other parents (45, 46) however, served their children the same portion sizes regardless of age (‘P11: “My two get the same size and that’s them three and six, you know...” P08: “So do mine”.’(46).

Sub-theme 2.2. Body size and weight status

Parents in two studies (39, 50) who perceived their child as carrying too much weight, restricted their child’s portion sizes and/or third helpings (“We do try to portion foods for Jerome because he’s a little on the heavier side”.; “I’ll say to the bigger child, ‘That’s enough. You already have 2 plates...’.”(39). While other parents (39, 46) would not feed their child differently due to their weight to avoid discrimination (“I wouldn’t change how I feed her because she’s overweight. I don’t want her to think that there’s anything wrong with how she is”.’(39). Conversely, in three studies (38, 45, 47), when parents or others such as family perceived the child as too thin they did not restrict the child’s portion sizes, allowed third helpings if desired, and encouraged continued eating even in the absence of hunger (“If Joe would have wanted thirds, we would have let him, because he’s always really thin”.; “She’s tiny...Even if she says she’s not hungry, I’ll just be like ‘Well, just eat a little bit’.”’(39).

External factors

Sub-theme 3.1. Perceived healthfulness of a food or beverage

Parents in eight studies (39-43, 46-48) tried to balance their child’s intake of perceived less healthy and healthier foods and beverages (“I feel like she didn’t eat that fruit... it’s like a trade-off. You don’t get the cookie”.’(47). Parents in six studies (40, 42-44, 47, 48) restricted portion sizes of perceived less healthy foods or beverages (“...when it comes to things that are not so healthy I just tell him, you know. One ice cream sandwich is enough”.’(48)). Parents reported different practices for this, including hiding foods or beverages, controlling portions (“I don’t give them two pop tarts. I give them one per child. They don’t get a whole pop tart pack”.’(48), using smaller serving ware (‘...to control portion sizes

of sugar-sweetened beverages (“only give them a small cup”). (42), or not buying them in the first instance. Parents in two studies also used less healthy foods as a contingency to encourage consumption of healthier foods (“So, if you want some cake, you are going to eat this!”.’ (41, 47). (Indulgent feeding practices of male partners or spouses frustrated female parents in four studies (45-47, 51) who reported them to serve larger portions than they would, particularly of less healthy foods. Perceived healthier foods or beverages were offered to hungry children thought to have already eaten enough (“You’re not getting thirds...Dinner is done. You can drink some water, eat a piece of fruit, that’s it”.’ (39), were permitted to be consumed by children *ad libitum* (“If it’s healthy I’ll tend to give her more of the item, whatever it is”.’ (48), and were used to balance-out less healthy food or drink intake (“So I’ll give her that [peanut butter and jelly...], but she has to eat a vegetable”.’ (48).

Sub-theme 3.2. Portioning resources

In two studies (42, 48), parents with younger children (aged 2–5 years) described using resources such as pre-portioned child snacks or child serving ware (e.g. ‘child-sized’ plates, bowls, and cups) to simplify, or replace entirely, their decision on the portion size to serve. Pre-packaged single portion snacks were purchased for their convenience and to restrict portion sizes of perceived less healthy foods (“Um, the potato chips, I buy the small bag. So when it’s finished, that’s it”.’ (48); “While on the road...a juice box is easier”.’ (42). Hand or finger sizes were viewed as convenient for deciding portion sizes without needing utensils or containers (48). Few reported using measuring cups or weighing foods to determine portion sizes (42, 48). Parents in two studies (40, 45) were unfamiliar with weighed portions and expressed unwillingness to weigh foods for their child (“I hadn’t really got a clue about how much makes 30 g, or 60 g”.’ (40); “I still don’t have time to figure out...I just don’t want to”...(45).

Sub-theme 3.3. Authoritative guidance

Parents in two studies (42, 43) expressed a desire for information on appropriate portion sizes for their preschool aged child and on who should decide portion sizes. Other parents (42) however, agreed more guidance would not be welcomed due to existing ‘information overload’ (40). Yet, parents in three studies (42, 45, 46) were unaware of existing guidance on child portion sizes (“I don’t think there is any guidance for portion sizes, I mean until you mentioned it and I felt oh actually yeah I think that’s an issue with our house”.’ (45).

Quantitative study findings

Narrative synthesis of 14 quantitative studies, found portion sizes parents serve vary substantially and are influenced by amounts parents serve themselves, perceived child hunger, and parent and child body size. Parents prefer not to limit portion sizes their child consumes (they are more willing to improve quality of their child’s diet and/or increase physical activity than limit portion sizes for

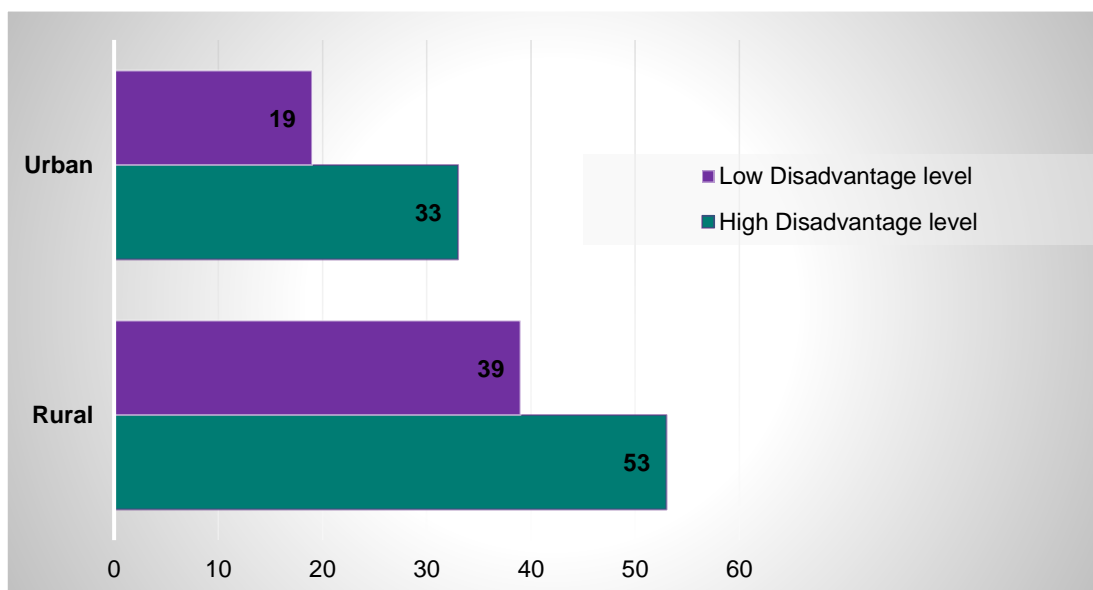
children with overweight or obesity). Parents serve their child larger portion sizes if their child has a higher body mass, if the child is perceived to be hungry, and at meals where the parent serves themselves more.

Food and beverage portion sizes of children: a qualitative study of the views and practices of parents on the island of Ireland

Participant characteristics

A sample of 144 parents were recruited (Figure 4). A total of 86 (60%) of parents had a child attending a high deprivation school and 58 (40%) had a child attending a low deprivation school. A total of 92 (64%) parents had a child attending a rural school and 52 (36%) had a child attending an urban school. The majority of participants were female, therefore in the consideration of these findings, it is important to note that views obtained are largely representative of maternal views.

Figure 4: Number of parents' of children aged 2-12 years who participated in a focus group investigating child portion size views and practices and demographic characteristics of their child's school



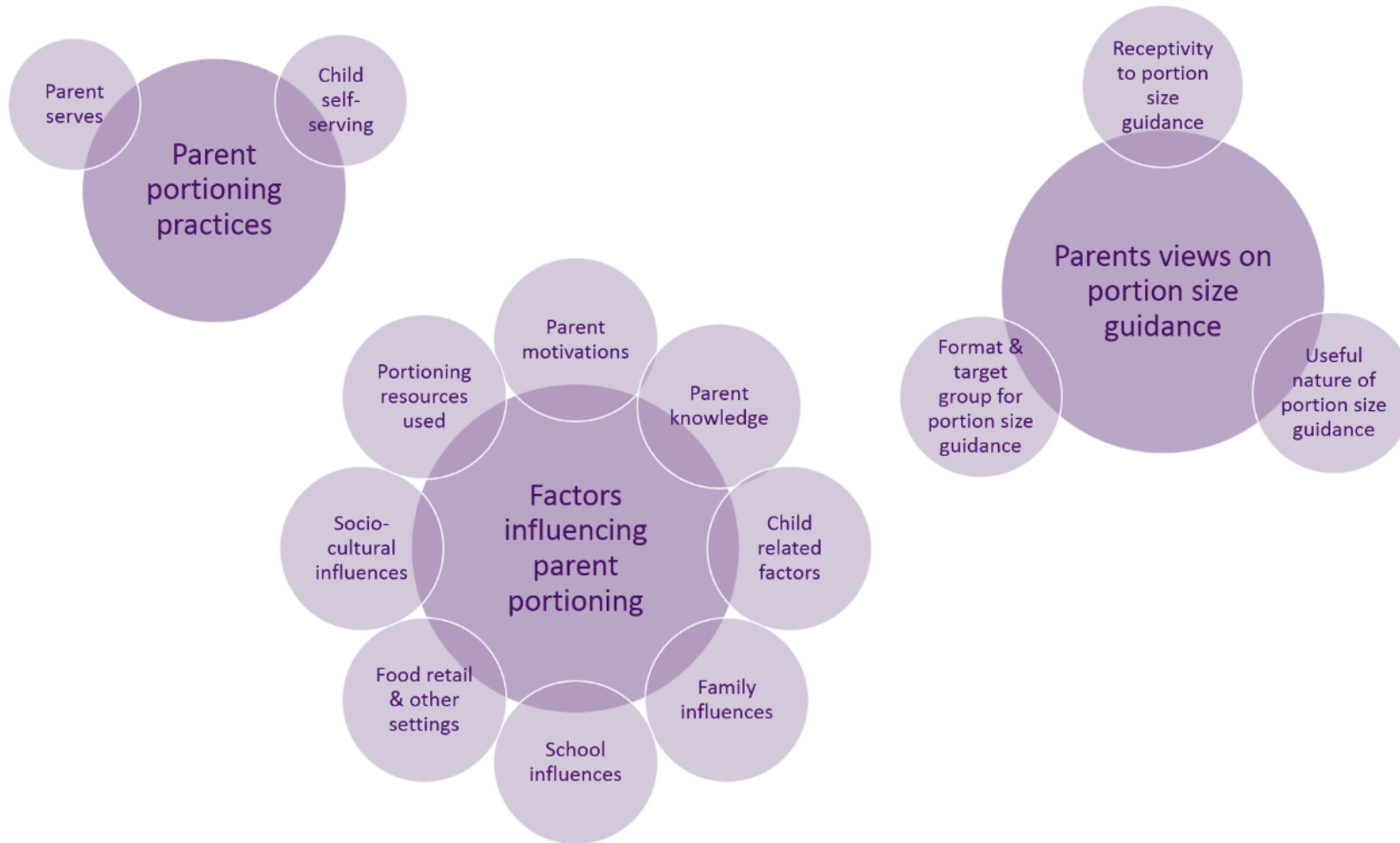
Themes identified

It was apparent from discussions that parents do not consciously think about the portion size (quantity) that they give to their children but place greater focus on the types of food served. Generally, parents feel that the portion sizes that they give to their children are appropriate. This was

reflected in the three main themes comprising of multiple sub-themes that were identified from the analysis (Figure 5):

- 1) Parental portioning practices,
- 2) Factors influencing parental portioning, and
- 3) Parental views on portion size guidance.

Figure 5: Summary of main themes from qualitative focus groups



Theme 1: Parental portioning practices

Sub-theme 1.1: Parent serves

It was clear from discussions that parents portion out breakfasts and dinner for children and pack their school lunches. Portioning was almost always performed by mothers, although male spouses also portioned meals, often dependent on family routines such as parents working hours. Meals are usually portioned out for children in the kitchen and mothers spoke about lining up the plates by the cooker and working down each of them.

“My partner would pack most of the lunches” (Male, ROI, rural, high deprivation school)

“In my case it’s usually my wife” (Male, NI, rural, high deprivation school)

“We always sit down every evening. The four of us sit down as a family and eat. I dish it out at the cooker” (Female, ROI, rural, low deprivation school)

“The plates are all lined up and it’s just like gradually go down” (Female, NI, urban, low deprivation school).

Sub-theme 1.2: Permitting children to self-serve

Generally, a set amount of food is served to children on their plate or in their lunchbox, however on occasions, parents allow their children to serve themselves. Some parents reported that for specific evening meals they would place prepared foods on the table for children to help themselves, for example, fajitas and home-made pizza toppings. Some parents also allowed children to self-serve accompaniments to a meal such as bread.

“No we don’t do the pot in the middle we just, the only thing they kind of do their own self-service is just sometimes we make these small homemade pizzas, do you know they literally, the wrap and I get them to put the sauce on them themselves and then I’d have some cheese and ham and they just shape it on themselves of whatever they want and into the oven and that’s the only time we do the kind of self-service thing” (Female, ROI, rural, low deprivation school)

“With regards to what you were saying about the kids picking their own, if we were having like something like stew or spaghetti bolognese or something where there’s like crusty or garlic bread or something sitting out, then they would be that way, you know, the bread side of how much they’re eating cause they would just sort of like be helping themselves so they would” (Female, NI, rural, high deprivation school)

During weekdays, most parents serve breakfast to their children as they find this quicker to ensure the children leave home on time for school. On weekend days, however, several parents allow their children to serve their own breakfast.

“In the morning you’re just in a rush to get them out the door. If you left it to them to do it, you’d be late. I work part-time as well and I have to be at work at 9:00, so by the time you’re waiting for them to get dressed and everything else, it’s easy while they’re getting dressed to get the cereal ready, so by the time they’re ready you can just get them out quickly” (Female, NI, rural, high deprivation school)

“Well at home, well if they’re making the porridge and stuff, depending on the time, sometimes they do it themselves. At the weekends they do it themselves” (Female, ROI, urban, high deprivation school)

Children serve their own breakfasts when parents feel that they are capable of serving themselves without making a mess or harming themselves. This was usually around the age of 10 or 11 years but was highly dependent on the child. Parents continue to make toast and serve hot foods due to safety concerns. Parents often described that on occasions that they allow the child to self-serve, children serve themselves the same amount as they would serve for them.

“Mine would burn the hands off themselves” (Female, ROI, urban, low deprivation school)

“But I would maybe come up and I’d hear her getting up and she would put the same amount that I would put in front of her, she’d know” (Female, ROI, urban, high deprivation school)

Considering snack foods and beverages, children are allowed to access and serve themselves if parents perceived these to be healthy such as fruit, a slice of ham, cheese, yoghurt, milk or water. Some children could access their own treat foods at home such as crisps and confectionary or had money to buy them.

“If they come down and say they’re hungry, I just say, ‘There’s apples and bananas in the fruit bowl and there are grapes in the fridge. Take what you want’ (Female, ROI, rural, high deprivation school)

“But the snacking I can see him he’ll ask, but then sometimes on the xbox I’d find things that I didn’t know that were up there, and I’m having a hissy fit then going, where did that bar of chocolate come from. And they get their own money as well and they have access to the shop (Female, ROI, urban, high deprivation school).

Theme 2: Factors influencing parental portioning

Sub-theme 2.1: Parent motivations

It was apparent that parents learn the portion size that their child will eat through the experience of feeding them on a daily basis. Parents therefore have an understanding of the amounts that are appropriate for their child. They often described the process of learning the appropriate amount to feed their child as ‘trial and error’ and that learned amounts become the routine portion sizes that they serve for their child.

“Growing up with them you kind of know what they want and the portions they want. You could put something down and you know, she’s not going to eat that. You know your child, you know yourself, it’s just a thing that you know” (Female, ROI, urban, high deprivation school)

“Mothers instinct aye” (Female, NI, rural, high deprivation school)

“I guess it’s trial and error you kind of over the years you kind of know how much they eat and that’s what you give them” (Female, ROI, rural, low deprivation school)

“I think it’s just a habit that you sorta get into. You’re just used to cooking them amounts and then you just throw them out the way you always do” (Female, NI, urban, high deprivation school)

A frequently discussed factor dictating portion size was parental desire to ensure that their child was fed and well-nourished. Parents also described feeling bad and worried if their child was left hungry. Parents placed most emphasis on their child eating ‘enough’ of their dinner meal. This was evident in parents stating children would come to them to ask them if they had eaten enough of their meal.

“Cause you’re scared of them being hungry” (Female, NI, rural, high deprivation school)

“I’d be just afraid in case they are hungry that you’re not giving them enough” (Female, ROI, urban, high deprivation school)

“I think, I mean, mine would always, “Have I had enough?” You know and you know, “Would you eat more of that meat?” And they’d eat more of the meat and then show me, “Is that enough?” “Right, okay, away you go”” (Female, NI, rural, high deprivation school)

In contrast, parents also want to ensure that their child is not over-fed. Several parents discussed having a child with a large appetite and that they have to monitor the amount of food that they consume.

“So, he will just eat and eat and eat. So I have to have a specific amount set and say that’s all you’re getting” (Female, NI, rural, low deprivation school)

“She would eat seconds and thirds and fourths and wouldn’t know when to stop, so I do sort of have to say to her look you’ve had enough food, that’s it” (Female, NI, urban, high deprivation school)

“She’s perfectly fine, but she just has a massive appetite. She’ll eat and eat. Then she’ll go, ‘Can I have this now?’ And I’ll go, ‘The kitchen is closed.’” (Female, ROI, rural, high deprivation school)

“I have a sister-in-law who, she is like a stick, and as a child, I think really...no appetite and eats no vegetables and no fruit and you know, that stresses me out, I’d hate to think of them not wanting to eat good stuff. But then again, I don’t want her to have too much, it can be, if you think about it too much it’s quite stressful, definitely” (Female, NI, urban, low deprivation school)

Some parents described serving a small amount for the first serving and then serving more if the child was still hungry. It was evident that parents used this approach as they often expressed that when they served a large plate of food at dinner or too much choice in their lunchbox, children were less inclined to eat. Therefore, to encourage intake, most parents started with a smaller plate first. Although not a major motivating factor, a few parents mentioned giving their children a smaller portion to avoid food waste.

“I will give them small amounts and if they are hungry and they want more they will ask for it, that’s how it goes” (Female, ROI, rural, low deprivation school).

“I find em like if I gave my wee boy a big plate he won’t eat it. Cause it looks like too much, for him it’s too much for him” (Female, NI, rural, high deprivation school)

“There’s no point in putting on a big load because you know it’s all going to be thrown out. There’s nothing worse than that” (Female, ROI, urban, high deprivation school)

Children are generally allowed second servings if they have eaten their dinner and are wanting more, but the second serving is a smaller amount than the first. Some parents however, particularly those with larger families, do not cook extra or offer second helpings.

“We don’t have seconds unless pretty much you finish what’s on your plate” (Female, NI rural, low deprivation school)

“But it’s not usually the same size of plate you know, it’s usually about half the size and then that’s him happy” (Female, NI, rural, high deprivation school)

“There’s never any extra in our house. Like if it’s something, yeah, it’s like how many, you take however many and you take however many and if it is chicken then there’s never any extra anyway, like it’s torn down to the bone, there’s nothing left. There’s too many of us in our house, it just goes, there’s nothing left so...” (Female, NI, rural, low deprivation school)

Parents tried to balance their child’s intake from food groups at the dinner meal, including protein foods (e.g. meat, chicken or fish), carbohydrate foods (e.g. potato, pasta or rice) and vegetables. This was discussed more commonly among parents from the ROI, with some parents describing their child as a ‘meat-eater’ or to like pasta. For these children, parents would encourage more from the food groups that they were not eating before giving more of the food type that they liked.

“Mine in particular would, say she would like pasta and we might have say Bolognese just as an example so she will eat all the pasta and say Mummy is there more pasta and I’d say there is but then I have to encourage the protein or the vegs or whatever it might be before I gave a little bit more carbs so it is to have that little bit of control, to give the healthier ones”. (Female, ROI, rural, low deprivation school)

“I think they are definitely meat eaters, I’d probably, if they were looking for a second bit of meat they would be hopeful they would try and get half of the half of the spud into them” (Female, ROI, rural, low deprivation school)

Most parents do not force children to ‘clear’ their dinner plate, however would encourage children to eat a bit more. Parents want their child to eat enough of their dinner meal to fill them up with ‘good’ food and avoid children asking for more food later on in the evening. Desserts or treats were offered as an incentive for finishing all or most of their dinner.

“I would try and get them to eat most of what’s on their plate but if they’ve really had enough, I wouldn’t force them” (Female, NI, urban, high deprivation school)

“Enough, or what I think is the majority of what’s on their plate. It will be like “No, have another bite of your sausage” or have another bite of whatever and then...” (Female, NI, rural, high deprivation school)

“Even the other day I said have 2 or 3 more spoons, and she says ‘I had 5 mum’ and I said ‘you’re amazing’. Because you want them to fill up on the proper food you don’t want them to come back 2 hours later saying ‘I’m starving, can I have a biscuit...can I have a sandwich?’” (Female, ROI, urban high deprivation school)

“Like there’d be like...if my wee young boy wants pudding then he has to eat most of it...” (Female, NI, rural, high deprivation school)

“If he wants a treat he can only have it if dinner is eaten” (Female, ROI, rural, low deprivation school)

Parents generally encouraged their children to consume healthy foods and drinks. For this reason, most parents were happy to let their children eat larger portions of foods perceived to be healthy such as fruit and vegetables and limited the portion size of foods and drinks they perceived to be less healthy. Children preferred to eat less healthy foods and drinks, which was the main barrier to parents in achieving this. Parents allowed children unlimited access to snacks perceived to be healthy such as fruit but most restricted their access to ‘treat’ foods by making it a rule that children must ask for them, hiding them or placing them out of their reach.

“If they want veg or anything like that there they can have as much as they want” (Female, NI, rural, high deprivation).

“And sometimes they ask can we have more and if it’s a casserole I’d say yeah you can have more. But if it was a pizza, no you are not getting anymore, you have to stop” (Female, ROI, urban, high deprivation)

“We’ve a goody press up high, so if you want something, you have to ask for it” (Male, ROI, rural, high deprivation).

Parents stated that when they are tired or under time pressure, they prepare meals that are faster and often less healthy, however time pressures did not impact the amount of food parents serve to their children.

“No, the amount stays the same but in our house we have [out of home activity] on a Monday and BB on a Tuesday, so those are the nights, like tonight, right, we’re doing hot-dogs and burgers because it’s quick” (Female, NI, rural, low deprivation school).

“I was going to say if I’m tired and can’t be bothered it would be a takeaway” (Female, NI, rural, high deprivation school).

Sub-theme 2.2: Parent knowledge

The sample of parents had some awareness of healthy eating guidelines with several parents discussing the *Eatwell Guide* (NI) or the *Food Pyramid* (ROI). Some parents in NI mentioned NHS child development literature that they had received when their child was born.

“Well the information that we all know going back, we all know the pyramid, we all know the portion sizes, we all know...” (Female, ROI, urban, high deprivation school).

“I was handed a birth to five book with Becky...but it has information in it about healthy eating and things” (Female, NI, rural, low deprivation school).

Regarding knowledge of appropriate portion sizes for children, a few parents mentioned they were conscious not to serve large portions to their child as this would build-up their appetite.

“Yeah you would just be afraid that they are getting too much and then it has to gradually increase and the tummy expands and it has to be filled more” (Female, ROI, rural, low deprivation school).

“If I am honest, I do think in my head, I think well, if you let them have loads and loads and loads, they’re going to keep wanting that and you kind of are thinking, you know, longer term of them, thinking well you can’t eat double portions all the time” (Female, NI, rural, low deprivation school).

Sub-theme 2.3: Child-related factors

One of the main factors effecting the portion size that parents serve is how hungry their child is, i.e. their appetite, which they observed changes as they get older, during periods of growth and when they are more physically active. Most parents’ stated that they serve larger portion sizes to older children than younger children and larger portion sizes during periods of growth.

“The two older ones, six and the eight-year-old, they will have more or less the same sized portion really, and then the three-year-old will have a smaller portion and the baby then will have smaller again” (Female, ROI, rural, high deprivation school)

“For the last few years my son went through a colossal growth spurt and you couldn’t feed him, like he was constantly hungry” (Female, NI, urban, low deprivation school).

“Especially at that age, because they go through growing spurts as well, and sometimes they might not have a big appetite, they might not finish off their dinner and they might not want a lot, and then there are other times when they’ll eat you out of house and home, so you’d give them a little bit extra, the dinner would be bigger to fill them up and stop the whingeing” (Female, ROI, rural, high deprivation school).

Parents increased portion sizes given to children following physical activity due to their increased appetites and were less concerned about children who are highly active having larger amounts of food.

“If my son has been excessively active I’m going to allow him to eat more...and if there’s certain times when he’s not being active or he’s not doing much, I will make the portions a little bit smaller” (Female, ROI, urban, low deprivation school)

“But I...my two are very active so between football and Tai qwon do and ballet and swimming, you know, they’re always on the go, so I don’t get too paranoid if they do eat a lot a day” (Female, NI, urban, high deprivation school).

“Mine are really active so they would get something and then, they’d usually have a snack when they get home and then their dinner, supper as well but I don’t mind because they do sport nearly every night so it’s okay” (Female, NI, urban, low deprivation school).

The portion size served is therefore to fill the child and satiate appetite which is influenced by the child's age, developmental stage and activity level. However, parents also viewed each child to be individual in terms of their appetite. This was evident from parents observing differences in the amounts siblings eat or the amounts that other children eat in contrast to their own children.

"Different kids are different individuals and have different appetites" (Female, NI, rural, low deprivation).

"I think every child just eats so different. They're all so different" (Female, ROI, rural, high deprivation).

"Born exactly the same, they can even be two girls, they could be doing similar activities and yet they will need different portions sizes. So while you could educate yourself as much as you like, you've got to be flexible within that. Know your own children". (Female, NI, rural, low deprivation school)

Parental perception of their child's body size is also a factor in parental portioning. Their children being a healthy weight is an indicator that they are giving their child appropriate portion sizes. Some parents reported that they had or would reduce portion sizes if they thought their child was putting on too much weight and had or would increase their portion sizes if they thought their child was underweight.

"I wouldn't say that my children are any way over weight at all. I would look at them, I mean, if I thought they were overweight, yes then maybe I would look at those portion sizes compared to what I was giving, and think, right okay, that's why we're overweight" (Female, NI, rural, high deprivation school)

"Well if xxxxx went back to look for seconds I'd say no 'cos I'm watching her weight, I'm watching her because I can see her in myself 'cos I was big, I'm still big, I was big as a child and I can see her being the same way and I'd say no, you've had enough" (Female, ROI, urban, high deprivation school)

Although most parents served their children with different appetites different amounts of food, it was mentioned that children sometimes complained when they could see siblings receiving a different amount of food than themselves. For this reason, a few parents said that they would serve their children the same amounts.

"Because I know that if I give her, you know... "She's got less than me, she's got..."" (Female, NI, rural, low deprivation school)

"No, I can say no to her, but what she does then is, 'how come he's got three and I've got two' and then he says 'I'm 3 years older than you' and then here we go again! Would you stop!" (Female, ROI, urban, high deprivation school)

Gender was an influencing factor for some parents.

“It is funny now, xxxx is 13 but probably as most of you know, she is very slight. Xxxx is almost as tall as her really, and even though he is like nearly three years younger than her, the two of them would probably eat very similar and I think maybe because he is a boy, he probably just needs that wee bit more anyway” (Female, NI, rural, low deprivation school)

“But I give him a bit extra because he’s a boy. He needs it!” (Female, ROI, urban, high deprivation school)

Children’s food preferences often dictated the amount of foods that they were served. If a child likes a particular food, the parent would serve them a larger portion of it. Catering to their child’s preferences was to ensure that they ate ‘enough’ and, in particular, ate more of foods perceived to be healthier such as vegetables.

“I would give him more of that cause that’s what he likes, he likes that and I know he eats it and gets a full belly” (Female, NI, rural, high deprivation school)

Obviously then there are times when one might like what you’re giving a little bit more than somebody else so you might not give as much to one child and maybe give a little bit extra to the other because they like what they’re eating. xxxx for instance, I could actually give her a plate of carrots and she’d just...whereas the smallest little bit of carrot to xxxxx and you’re fighting with her to eat that” (Female, ROI, urban, high deprivation school)

When portioning meals, parents also take into consideration the child’s eating patterns. What the child has eaten throughout the day would impact the amount served at the dinner meal. For example, a smaller portion would be served at dinner if the child had already had a dinner at school or been constantly snacking or grazing throughout the day. This is to ensure that the child has eaten ‘enough’ and to prevent the child from having too much to eat.

“Sometimes as well if maybe I know that xxxx hasn’t ate much during the day, I would give a bigger portion for her” (Female, NI, urban, high deprivation school)

“But as I say if it’s a day where maybe xxxx has just had a sandwich for her lunch, I’d be more keen to think she’s having something more substantial in the evening whereas if it’s a day where she’s had dinner, well I kind of think, she’s had a decent meal in the middle of the day” (Female, NI, urban, low deprivation school)

Sub-theme 2.4: Family influences

The portion size given to the child is dependent on the person serving the food. Some male spouses were reported to give larger portions than mothers.

“The odd time my husband would do it and you should see the size of the portions when he does it. I’m like are you feeding yourself!” (Female, NI, urban, high deprivation).

“If my husband serves he always gives way bigger portions than I would give her, he would give her my size portion sometimes, and she never ate that” (Female, ROI, urban, low deprivation)

“I find with cereal, when my husband would dish it up, like porridge, xxxx gets a big massive bowl of porridge like that and you can just see her looking at me like...” (Female, NI, rural, low deprivation school)

Grandparents were reported to serve much larger portions than parents would as well as providing additional snacks. Some grandparents, however, were reported to serve the same amount or smaller portions than parents would.

“When they’re getting dinner at my mum’s, she definitely would put a bigger portion out because she’s just not used to the amount they eat, I suppose” (Female, NI, rural, high deprivation school).

“My mam is a feeder. She’s a brilliant cook though, but the portions, Jesus!” (Male, ROI, urban, low deprivation school)

Sub-theme 2.5: School influences

It was apparent that the food that parents provide in children’s school lunchboxes is not normally finished. It was frequently discussed by parents that their children tell them that the short lunch break at school is the reason for this. A few parents mentioned giving their child less food to school as they had requested this based on not having enough time to eat.

“Usually my guys it’s, if they haven’t eaten lunch it’s because they didn’t have time to eat it. I am always flabbergasted when xxxx started here first, his first year for about two weeks he wasn’t eating a lunch at all. Why aren’t you? I don’t have time, I don’t have time. I was like, what is all this?” (Male, ROI, rural, low deprivation)

“Even if they wanted to eat it they can’t because it’s all rush, rush, rush really for them” (Female, ROI, urban, high deprivation school)

“It’s too rushed, they’re trying to eat a snack, she just takes nothing because she hates being stressed and flustered so she just takes like water till lunch and then, even then she barely touches it, she’d have a pancake and maybe eat half a pancake and half a packet of crisps and that’s her, like she just, whenever she comes home then she’s hungry” (Female, NI, rural, low deprivation school)

In ROI, some schools provided school lunches and some also offered breakfast. However, parents reported sending additional food to school with their child to ensure that they had something to eat in case they did not like the food provided by the school.

“Even when they were getting the other lunches from the school, I’d still have to send in another lunch with them because if they didn’t like what was in the other lunch, they’d come home, and they mightn’t have eaten” (Female, ROI, rural, high deprivation school).

Most parents said that they were unaware of the portion size that their children receive for school meals or dinners. Some parents, particularly in NI, expressed that they would be interested in having more information about this.

“But I’ve no idea what a school portion is and I think as parents it would be nice to know, you know, what they get” (Female, NI, urban, high deprivation school)

Sub-theme 2.6: Food retail and other settings

Most parents view children's meals in restaurants as being a larger portion size than they would serve for their child. It was frequently discussed by parents that less healthy accompaniments to children's meals such as chips were served in large portions. Therefore, parents would ask for half-portions of adult meals or divide the child's meals between their children to control the portions. Parents will do this as they do not want to have to pay for more food than their children need or to waste food. It should be considered, however, that some parents view eating out as a treat occasion and so don't mind their child eating a larger portion than they would serve at home. In the ROI, it was apparent that parents living in urban geographical locations ate outside the home with their children on a weekly to monthly basis, whereas parents living in rural areas ate out with their children on special occasions only.

“The portions are massive, I find it a waste. I nearly sometimes feel like saying, look can you just bring me one between two, but you don’t want to seem stingy in a restaurant. But it’s such a waste” (Female, NI, rural, high deprivation school)

“Or get one big portion but half it between the two of them” (Female, ROI, urban, high deprivation school)

“When they’re eating out they’re generally being better behaved. So I’m happy for them to just eat away. But I think that if we ate out more I would probably be more concerned” (Female, NI, urban, low deprivation school)

“I suppose with restaurants they probably...I am thinking, they usually get a lot and I just leave them at it I suppose because you are paying for it but you know, I don’t know, massive, you know twice the size as normal” (Female, ROI, rural, low deprivation school)

Children's fast-food meals were generally perceived to be an appropriate portion size for smaller children but too small a portion for older children or children with a larger appetite. Some parents therefore order adult meals for their children to ensure that they get enough food and feel full.

"Well xxxx at the stage now where she would eat an adult meal and she will finish an adult meal. The happy meal is ok for the younger kids but I think as they get older, they like a bit more" (Female, NI, rural, high deprivation school)

Takeaways eaten at home are generally portioned similar to home prepared meals.

"We just get a wee variety of things and split. They don't get their own takeaway, they just get a bit of this and a bit of that" (Female, NI, rural, high deprivation school)

"I get my own and he gets his own and we probably split it between the two kids but we'd have it the next day" (Female, ROI, urban, high deprivation school)

Pre-packaged foods that parents would include in their child's lunchbox such as cheese snacks and yoghurts were viewed by parents as an appropriate portion size for their children. Some pre-packaged foods were viewed as being better value for money when larger sizes were purchased. Some parents expressed frustration with smaller, child sized pre-packaged products being more expensive. A lower cost of certain food and drinks therefore encourages parents to buy larger portion sizes.

"xxxx likes [brand name yoghurt], so it's a measured portion and she has that as part of her lunch, it's in her lunchbox. Less coming home, not having to worry about the spoon" (Female, NI, rural, low deprivation school)

"Or the share bags of crisps, you go, I'll just have those. And that there's probably...they make it more cheap to buy the bigger packs" (Female, NI, rural, low deprivation school)

"But even like your kids water like it's probably four times the price of your regular water but and that's the thing that annoys me most about the kids treats is they are so expensive compared to what you are buying do you know so buy a packet of crackers for you know seventy cents instead of these little individual snackers or something like that and you know you've €4" (Male, ROI, rural, low deprivation school)

Some parents also mentioned that children are offered a wide range of 'treat' food and drinks at and that children eat larger amounts when serving themselves these foods at events than they would be given at home.

"But you see they are asked to other people's houses where there are parties, birthday parties and you can't control what they are eating and they'll see a table full of food... I feel in a way

when they see all the crisps and the biscuits do you know, I say Wow, let's go". (Female, ROI, rural, low deprivation school)

"I hide at parties because my kids go up and eat so much" (Female, NI, urban, low deprivation school)

Sub-theme 2.7: Socio-cultural influences

Parents reflected on their childhood experiences of being fed by their parents and how this has influenced how they feed their own children. Several parents mentioned that they would never force their children to finish a meal, as this was something that their parents had done. They also observed that their parents would not have given them anything to eat after a meal, regardless of whether they finished it, whereas they would offer their own children snacks at a later stage if they hadn't finished their meal. A few parents discussed that the bigger portions that they have been used to getting or seeing their parents eat have become normalised as an appropriate portion size and therefore they are giving their child larger portions. Similarly, some parents reflected on how the amount that they eat could affect the amount that their children eat.

"I wouldn't force mine to clear their plate because I was forced as a child and I think it gave me a lot of other issues as I started to grow up" (Female, NI, rural, low deprivation school)

"My parents used to sit down and make sure you eat every single bit, so I'm not going to be like that" (Female, ROI, rural, high deprivation school)

"Yeah, see I've had to go against the rules of eating when I was growing up too about eating between meals cause xxxx comes out of school starving. xxxx, he comes out of school really hungry and I would have to have something like a wrap or a sausage roll or something to keep him going to his dinner time. Whereas when I was growing up you didn't eat, you waited to your dinner and then you were expected to eat it all" (Female, NI, urban, high deprivation school)

"Our eating habits in front of them. I've now discovered, I'm a shocking eater, I would eat all day if I can but especially the evening time. I would eat a loaf of bread in a couple of days in sandwiches, so now I have to put my hunger to the side and hold on till they go up to bed to make a sandwich cause they'll go "What can we have?" "Nothing" "Why are you having something?" So I don't do it anymore" (Male, NI, rural, high deprivation school)

Sub-theme 2.8: Portioning resources used

Most parents serve children their meal on a smaller sized plate such as a plastic children's plate or a side-plate, or a smaller bowl. Parents reported that the main reason for this was to help them control the amount that they are serving and as giving their child a large amount of food would over-whelm them and cause them not to eat. As previously discussed, parents learn the amounts that their child

will usually eat and therefore they portion out these learned amounts using the same plates and bowls they always use to serve their children. Others used the same size plates and bowls for all family members but served different portion sizes to different family members.

“I use a smaller plate, they all have their own novelty plates or whatever so I usually gauge it by that” (Female, NI, rural, high deprivation school)

“Smaller plate than ours, yes. She’d be looking at it and she’d go off it completely if there was a huge amount on the plate” (Female, ROI, rural, high deprivation school)

“I tried it (using smaller plates) but it didn’t work very well because he felt he was being made different. So we have kept the same sized plate but kind of by stealth the portion size is smaller on his plate” (Female, ROI, urban, high deprivation school)

Some parents used either the size of their own hand or the child’s hand to determine portion sizes to serve their child or based their child’s portion on less than or half of their own portion size. Utensils were used by some parents to determine portion size such as serving spoons or ladles or ice-cream scoops for mashed potato. School lunches were all packaged in plastic lunch boxes or small containers for snacks. One parent noted that the size of the lunchbox used determined the portion size given to their child due to the desire to fill it.

“I just think...well I try to just give him...cause that there course I did they said like their wee hand is the size of their stomach so that’s all they can eat” (Female, NI, rural, high deprivation school).

“I’d consider the fact that their stomach is probably about the size of my hand, so how much are you really filling? I’d put extra in case, god love us, they might love it and finish the plate. But if they’ve eaten what I think will fill their stomach then it’s...” (Female, ROI, urban, low deprivation school)

“Like I use the ice cream scoop for mashed potato so xxxx and xxxx get one each and xxxx gets two” (Female, ROI, rural, low deprivation school)

“I found that lunch box size played an effect on what I was sending through for the lunch. xxxx lunchbox last year was a very civilised size and this year, he picked a big football. And I was looking at in the mornings going God, look at the space still left at that and I started putting other stuff in and had to actually stop myself because I was thinking what I am playing at here” (Female, NI, rural, low deprivation school)

Theme 3: Parental views on portion size guidance

Sub-theme 3.1: Receptivity to portion size guidance

It was evident that parents were generally disinterested in receiving portion size guidance and most parents said that it was not something that they had looked for. Parents felt strongly that they know

the amounts that their children need and that every child is highly individual and different in terms of the amount of food that they need. Parents therefore felt that a 'one size suits all' approach to portion size is not suitable and expressed that having portion size information would not cause them to change the amounts that they feed their children.

"I don't know that it necessarily would make me change because I think I would still probably more go by what I think my kids should or would eat. But it would probably make me think about it" (Female, NI, urban, low deprivation school)

"We know what we're going to give, or we know what way they're going to be. It's not that we don't want it, but, you have an idea I think, because you're there every day, of what they're going to eat" (Male, ROI, rural, high deprivation school)

"Yeah, if someone was to come up to you and say your child's BMI is really high and you really need to seriously consider, you would look at their portion size but other than that I wouldn't" (Female, NI, rural, high deprivation school)

"I tend to not listen, I go by the child... Yeah it applies to certain people but you know I think some kids just have a healthier appetite" (Female, NI, rural, high deprivation school)

"Well, a portion size for my ten-year-old and your ten-year-old, she might be a lot smaller. If you say to me, 'This is the portion for a ten-year-old,' and she has a smaller appetite than my xxxx, that's not going to work out, saying that that much is all she's getting, or she'll not be able to eat that much" (Female, ROI, rural, high deprivation)

Despite this, parents thought that receiving guidance on suggested portion sizes for children would be helpful as a guide to determine whether the amounts they were serving their children were appropriate, therefore reassuring them. It was evident that this information would also be beneficial for parents who are concerned about a child who they perceive to be over- or under-eating.

"Yes, a gauge. It wouldn't be like the bible because every child is different" (Female, ROI, rural high deprivation school)

"It probably would just so you know you're sorta on the right track with it... I think is xxxx getting too much!" (Female, NI, urban, high deprivation school)

Sub-theme 3.2: Useful nature of portion size guidance

The type of information that parents felt would be of most assistance was a visual and practical representation of appropriate portion sizes and how portion size should change with age.

"It needs to be much more visual. Showing two satsumas like as your portion. So, even a portioned pyramid for a healthy day" (Female, ROI, urban, high deprivation school)

“Factual and visual rather than like weights because I’m not going to be weighing out portions” (Female, NI, rural, low deprivation school)

“Rather than actually showing it out as diagrams (like the Eatwell plate), say like one spoonful of this per day or per portion, rather than showing it out on a plate that shows that tiny wee wedge of whatever, you know. Say like a couple of spoonful’s of this or a ladle of that (Female, NI, rural, high deprivation school)

“Sorry if they could be in scoops you know we’ll say ok for maybe one and go back to like 2 to 4-year olds they take one scoop then maybe I don’t know 4 to 6 then if they get two scoops, then 6 to 12 they get three scoops so you know like the way there is am” (Female, ROI, rural, low deprivation school)

Sub-theme 3.3: Useful format and target group for portion size guidance

Suggested delivery media for portion size guidance included television, social media and print media such as a leaflet or one page handout that could be sent home from school with children.

“Maybe more T.V. adverts on portion sizes for kids that might be an idea” (Female, NI, rural, high deprivation school)

“Facebook is probably a really good platform I think to reach most people. Most parents would be on Facebook” (Female, NI, rural, high deprivation school)

“But probably, these kinda days those pin posts through social media is the way to go” (Female, NI, urban, low deprivation school)

Parents in one group spoke about television documentaries and how impactful these were on their behaviours regarding recycling and branded food product consumption. A few parents mentioned **safe food** advertisements which had an impact on their portioning practices. However, many parents stated they no longer view advertising due to pre-recording programmes and forwarding through the adverts or using streaming media such as Netflix which does not show advertisements.

“Well I think that, for example that David Attenborough...I know it’s not food right, but we’d bought a whole lot of bottles of water and after watching the thing about the plastics. You can’t miss it, cause it’s just everywhere. We’ve actually stopped buying plastic bottles. And changed our...we’ve gone from lunch bags to lunch boxes, cause I would just throw them in the wee Ikea bags cause they’re easy. So I do think if the message is strong enough and it’s important enough then people will listen. But it has to be quite hard hitting for it to have any impact at all” (Female, NI, urban, low deprivation school)

The thing my two eldest enjoyed watching was that, the ten and twelve year old enjoyed watching that ‘Eat well for less’ that was on TV...but the format of it was educational for the ten and twelve year old cause they actually like the format of the show and I actually watched it with them, but we all got something from it. Cause that certainly made us think about, well why do we buy that brand?” (Female, NI, urban, low deprivation school)

“I’ve seen the ads where they’ll tell you, give kids smaller portions than adults. It was after that I started giving the child smaller portions. I used to pile it on the plate” (Female, ROI, rural, high deprivation school)

*“Not really no, I think **safefood** has a campaign where I don’t know, was it portion sizes and they fast forward people where they say this is, I know there was a girl and they fast forwarded her age, this is what is going to happen if you do this now. It did have an impact on you know”* (Female, ROI, rural, low deprivation school)

“We’re not watching a lot of adverts anymore really. I know I don’t even if I tape something” (Female, NI, urban, high deprivation school)

It should also be considered that several parents, particularly in NI, felt that public health nutrition information was inconsistent and always changing which may reduce their receptiveness towards it.

“Oh I think it gets confusing sometimes cause they keep changing what portion sizes actually are. It used to be 5 pieces of fruit and veg a day and then they upped it and then put it down again so you know it’s confusing at times” (Female, NI, rural, high deprivation school)

“I was told different things between the health visitors of both children. The first one, it was a case of make children respect the food that they have on their plate and make sure it all gets finished, but then with the second one, it was a case of no, don’t do that, because then you’re forcing the child to overfeed. So, when that child stops, that child has had enough and that’s their signal to say my stomach’s full. So, I have been told two different things” (Female, NI, rural, low deprivation school)

“A cholesterol bomb was an egg... at the moment, egg is really good” (Male, ROI, urban, low deprivation)

A useful time for providing this information may be when the children start school as most parents describe it becomes less clear how much to be feeding their children at this stage and as children become older, they are used to the portion size that you have been giving them, making it too late to change it. Parents expressed it would be useful to have information at different stages as the child grows older and their portion size requirements change.

“There’s all these guides for how to wean your baby, and then toddlers should be having this in the morning and this snack and this, and there’s always guidelines for that, but once they get to school age, there’s nothing really” (Female, ROI, rural, high deprivation school)

“At the beginning of their school career” (Female, NI, urban, low deprivation school)

I think it’s too late now. I think if you have smaller kids, yes. I think it’s too late for me now. (Female, ROI, rural, high deprivation school)

“If I do come across it now, it’s too late, they’re not going to change to a smaller portion” (Male, NI, rural, high deprivation school)

It was apparent that first time parents may be most receptive to portion size guidance as several parents expressed that they were more attentive to what their first child was eating.

“Probably, first time parents are very absorbent of what they see. If it’s your first child you have to do everything right, by the book and everything whereas once you’ve had a couple or they’re older, you don’t really go by any rules or what’s going on or whatever” (Female, NI, rural, high deprivation school)

“I think that’s something, it’s for first time parents. The guidelines would probably be more useful. Whereas, once you’ve had kind of one child going through, you’re more relaxed anyway. You’re also both, because you’ve given up the battle, but also because you actually know that the kids are can survive to that age! But when you’re kind of starting out, you’ve got more of the nerves, you’re looking for more information, more guidance” (Male, NI, rural, low deprivation school)

As grandparents feeding children large portions was frequently discussed, one parent also suggested targeting grandparents with portion size guidance.

“What about a wee hand out for grandparents!” (Female, NI, rural, low deprivation school)

Parents were also interested in portion size information being targeted towards their children through school. Parents find that children take what they have learned into the home with them.

“Even for the kids to be guided themselves” (Female, NI, rural, low deprivation school)

“I think it’s really important as well just to educate the children about what they’re eating and their portion size” (Female, ROI, rural, high deprivation school)

Several parents expressed a concern about their child focussing too much on diet and the amount that they are eating and developing an unhealthy relationship with eating. For this reason, any portion size information targeted at children should be delivered in a positive manner, focusing on health and the amount their body needs to function rather than body size.

“And again, you’d love them to have a healthy relationship with food and you’re not sure how best to do it, because you don’t want to labour the point too much but then you don’t want to just back off and leave them to it because then they’ll eat too much” (Female, NI, urban, low deprivation school)

“Sometimes you don’t want to frighten kids against food” (Female, ROI, urban, high deprivation school)

Children’s food and beverage portion sizes on the island of Ireland: a secondary analysis of the Cork Children’s Lifestyle Study (CCLaS) and the National Diet and Nutrition Survey (NDNS)

Introduction

Due to different nutrition guidelines in both jurisdictions, limited comparability between data collection methods and differing ages of participants in the datasets, the data for both studies will be presented separately. Full details of the analyses and detailed output tables are presented elsewhere (52).

After exclusions, food diary data were analysed for n=943 *CCLaS* participants (n=561 males, n=382 females) and n=470 *NDNS (NI)* participants (n=244 males, n=226 females). Mean (standard deviation) age of participants in years were 9.9 (0.6) for males and 10.0 (0.7) for females in *CCLaS* and 9.6 (5.2) for males and 9.4 (5.4) for females in the *NDNS (NI)*. Most participants were of a healthy weight (*CCLaS* 78% males, 73% females; *NDNS (NI)* 62% males, 67% females). The median (interquartile range) portion sizes consumed from each food group in *CCLaS* and *NDNS (NI)*, overall, and at breakfast, lunch, evening meals and as snacks are reported.

Sample characteristics

CCLaS (ROI)

Of the N=1075 participants aged 8–11 years in the *CCLaS*, complete food diary data were available for n=1061 (98.7%) children. A further 18 (1.7%) children were excluded from analyses due to less than three days food diary entries. Of the remaining 1043 children, a further n=100 (9.6%) were excluded due to under-reporting their energy intake, following a special diet (e.g. exclusion of dairy, wheat, eggs, fish, nuts and/or seeds, or adhering to a vegetarian diet), and/or having a diet-related medical condition at the time of data collection (e.g. constipation, cold or fever, vomiting or reflux, diabetes, or food allergy).

NDNS (NI)

Of the N=512 child and adolescent participants aged 1.5 – 18 years in the *NDNS (NI)* with at least three days food diary data, n=42 children were excluded due to under-reporting their energy intake, following a special diet (e.g. exclusion of dairy, egg, wheat, nuts, and/or fish, or adhering to a vegetarian, weight reducing or athletic diet), and/or having a diet-related medical condition at the time of data collection (e.g. complaints of the bowel/colon or other digestive complaints, diabetes, or food allergy).

Portion sizes of food and beverages consumed proportion contribution of food groups

Portion sizes in tertiles (data divided into three groups) of g/day are detailed for each food group of the Food Pyramid (ROI) and Eatwell Guide (NI) at each meal occasion. (Table 3 and Table 4 respectively). Across all meal occasions, males consumed higher median quantities of food than females. While food quantities were larger for males the relative proportion contribution of each food group was similar. The evening meal was the eating occasion where the highest quantity of food was consumed whereas lunch tended to be the smallest meal consumed for males and females in ROI (table 3). In NI on average, the quantities of food consumed at each eating occasion were more evenly distributed across the day (Table 4).

Snacks across eating occasions

Across eating occasions of notable interest is the composition of snacks consumed at different times of the day. Snacks consumed in the mornings were generally healthier, comprising primarily of 'vegetables, salad and fruit' (*Food Pyramid*) and 'fruit and vegetables' (*Eatwell Guide*), as well as 'dairy and alternatives' (*Eatwell Guide*) for *NDNS (NI)* participants. However, afternoon and evening snacks comprised a higher proportion of 'foods and drinks high in fat, sugar and salt' and 'eat less often and in small amounts' (*Eatwell Guide*), as well as 'dairy and alternatives' (*Eatwell Guide*) for *NDNS (NI)* participants. Full details of the types of snacks consumed can be found in Appendix 3.

Table 3: Portion sizes (grams) of each Food Pyramid food group consumed at each meal occasion by CCLaS participants (ROI), by gender

Food Pyramid Food Groups	BREAKFAST							LUNCH						
	Males (CCLaS)			Females (CCLaS)			P	Males (CCLaS)			Females (CCLaS)			P
	n=557			n=381										
Q ₁	Q ₂	Q ₃	Q ₁	Q ₂	Q ₃	Q ₁	Q ₂	Q ₃	Q ₁	Q ₂	Q ₃	Q ₁	Q ₂	Q ₃
Vegetables, salad and fruit	114.0	152.0	210.0	112.0	152.0	193.0	0.462	63.4	105.2	175.0	67.4	114.2	160.1	0.459
Other cereals and breads, potatoes, pasta and rice	27.3	36.4	52.0	24.3	33.3	49.0	0.003*	43.3	61.0	89.0	37.0	56.0	83.5	0.024*
Wholemeal cereals, breads, pasta and rice	30.0	40.0	76.7	30.0	40.0	60.0	0.093	37.0	54.0	74.0	27.0	41.7	69.0	0.035*
Milk, yogurt and cheese	99.0	157.0	228.0	74.0	127.0	201.0	0.000*	33.0	76.0	175.0	26.0	50.0	115.0	0.032*
Meat, poultry, fish, eggs, beans and nuts	47.5	60.0	111.0	28.0	50.0	69.0	0.000*	16.0	30.9	52.6	16.0	25.0	41.2	0.060
Fats, spreads and oils	4.7	7.5	10.0	4.0	5.0	10.0	0.062	4.0	6.0	9.5	4.0	5.5	9.2	0.660
Foods and drinks high in fat, sugar and salt	8.0	19.5	78.0	8.0	20.0	79.0	0.937	23.0	58.5	192.5	23.5	49.5	185.0	0.326
TOTAL g/meal	330.5	472.4	765.7	280.3	427.3	661		219.7	391.6	767.6	200.9	341.9	663	
	EVENING MEAL							SNACKS						
	Males (CCLaS)			Females (CCLaS)			P*	Males (CCLaS)			Females (CCLaS)			P
	n=557			n=381										
	Q ₁	Q ₂	Q ₃	Q ₁	Q ₂	Q ₃	Q ₁	Q ₂	Q ₃	Q ₁	Q ₂	Q ₃		
Vegetables, salad and fruit	29.3	55.0	100.0	31.3	57.2	104.6	0.452	76.1	117.5	178.5	68.0	112.0	155.0	0.071
Other cereals and breads, potatoes, pasta and rice	91.9	126.0	166.7	85.0	111.0	149.5	0.001*	41.7	56.0	83.1	40.5	54.4	77.9	0.317

Wholemeal cereals, breads, pasta and rice	44.0	69.5	96.0	41.0	70.0	135.0	0.896	37.0	54.0	74.0	33.0	46.0	73.5	0.078
Milk, yogurt and cheese	11.6	50.5	171.7	8.2	28.3	127.7	0.002*	52.7	100.6	159.0	50.3	84.0	135.5	0.026*
Meat, poultry, fish, eggs, beans and nuts	52.3	81.4	116.7	44.0	69.2	102.9	0.000*	16.0	31.9	56.0	17.3	33.0	57.8	0.652
Fats, spreads and oils	4.5	8.4	16.0	4.2	8.0	15.1	0.250	4.0	6.3	10.0	4.0	5.9	9.0	0.078
Foods and drinks high in fat, sugar and salt	32.0	134.0	228.0	25.2	120.5	217.8	0.357	38.5	79.0	147.6	39.7	77.4	131.2	0.071
TOTAL g/meal	265.6	524.8	895.1	238.9	395.2	852.6		266	445.3	708.2	252.8	412.7	639.9	

* A P-values < 0.058 indicates a significant difference across genders

Table 4: Portion sizes (grams) of each Food Pyramid food group consumed at each meal occasion by NDNS participants (NI), by gender

Eatwell Guide Food Groups	BREAKFAST							LUNCH						
	Males (NDNS)			Females (NDNS)			P	Males (NDNS)			Females (NDNS)			P
	n=215			n=175				n=243			n=224			
	Q ₁	Q ₂	Q ₃	Q ₁	Q ₂	Q ₃		Q ₁	Q ₂	Q ₃	Q ₁	Q ₂	Q ₃	
Fruit and vegetables	81.0	125.0	200.0	75.0	125.0	167.0	0.322	44.7	85.1	157.8	44.7	83.9	140.0	0.305
Potatoes, bread, rice, pasta and other starchy carbohydrates	25.6	38.4	54.0	25.9	35.7	45.5	0.168	59.4	80.5	112.7	52.4	72.0	98.1	0.005*
Dairy and alternatives	100.0	140.9	185.0	93.8	120.0	165.6	0.054	19.0	48.7	113.0	14.8	39.4	100.9	0.192
Beans, pulses, fish, eggs, meat and other proteins	37.0	57.8	117.4	23.0	60.7	116.0	0.792	35.8	53.3	86.7	28.8	47.1	75.1	0.022*
Oils & spreads	7.0	10.0	18.0	6.8	9.0	14.0	0.088	8.0	10.8	14.0	7.0	10.0	14.0	0.007*
Eat less often and in small amounts	10.0	23.5	80.0	8.1	21.8	64.7	0.439	28.1	62.7	175.0	23.6	54.9	129.8	0.046*
TOTAL g/meal	260.6	395.6	654.4	232.6	372.2	382.8		195	341.1	659.2	171.3	307.3	557.9	
Eatwell Guide Food Groups	EVENING MEAL							SNACKS						
	Males (CCLaS)			Females (CCLaS)			P	Males (CCLaS)			Females (CCLaS)			P
	n=243			n=226				n=243			n=226			
	Q ₁	Q ₂	Q ₃	Q ₁	Q ₂	Q ₃		Q ₁	Q ₂	Q ₃	Q ₁	Q ₂	Q ₃	
Fruit and vegetables	48.4	80.9	121.0	45.2	74.5	111.3	0.142	64.0	95.8	146.4	60.0	91.9	136.7	0.388
Potatoes, bread, rice, pasta and other starchy carbohydrates	82.6	119.2	167.1	84.1	112.8	150.5	0.162	28.0	49.2	86.3	30.6	47.1	77.0	0.956
Dairy and alternatives	10.4	53.7	150.0	8.0	31.7	110.1	0.073	70.9	132.9	185.5	50.0	98.3	147.6	0.000*
Beans, pulses, fish, eggs, meat and other proteins	65.8	99.1	132.2	49.4	81.1	112.1	0.000*	30.4	70.2	114.8	33.8	60.0	90.0	0.044*
Oils & spreads	2.6	7.0	14.0	2.4	5.0	9.5	0.021*	7.0	10.0	14.4	6.3	9.7	14.0	0.041*
Eat less often and in small amounts	20.9	63.6	147.3	20.3	52.6	140.9	0.337	38.8	76.0	145.4	29.0	58.0	105.0	0.005*
TOTAL g/meal	230.7	423.5	731.6	209.4	357.7	634.4		239.1	434.1	692.8	209.7	365	570.3	

* A P-values < 0.058 indicates a significant difference across gender

Proportional contribution of Food Based Dietary Guidelines Food Groups for ROI and NI

Table 5 outlines the food group recommendations for the food based dietary guidelines on the island of Ireland i.e. the Food Pyramid (ROI) and the Eatwell Guide (NI).

Table 5: Food Based Dietary Guidelines in ROI and NI

FOOD PYRAMID			EATWELL GUIDE*		
Food Groups	Recommended servings per day		Food Groups	Recommended servings per day	
	Males	Females		Males	Females
Vegetables, salad and fruit	5 – 7	5 – 7	Fruit and vegetables	Eat at least 5 portions of a variety of fruit and vegetables a day	
Other cereals and breads, potatoes, pasta and rice	3 – 5 (‘wholegrain wherever possible’)	3 – 4 (‘wholegrain wherever possible’)	Potatoes, bread, rice, pasta and other starchy carbohydrates	No serving size guidance	
Wholemeal cereals, breads, pasta and rice					
Milk, yogurt and cheese	3 (ages 5 – 8 years); 5 (ages 9 – 12 years)	3 (ages 5 – 8 years); 5 (ages 9 – 12 years)	Dairy and alternatives	No serving size guidance	
Meat, poultry, fish, eggs, beans and nuts	2	2	Beans, pulses, fish, eggs, meat and other proteins	No serving size guidance	
Fats, spreads and oils	‘In very small amounts’		Oils & spreads	No serving size guidance	
Foods and drinks high in fat, sugar and salt	‘NOT every day’		Eat less often and in small amounts	No serving size guidance	

*The food groups presented in the Eatwell Guide as percentage food weight are Fruit and vegetables 39%; Potatoes, bread, rice, pasta and other starchy carbohydrates 37%; Beans, pulses, fish, eggs, meat and other proteins 12%; Dairy and alternatives 8%; Oils and spreads 1%; Foods to eat less often and in small amounts (although not shown visually as a segment in the final image)3% (53).

Figure 6 and 7 presents the relative median proportional contribution of each food group (% of median g/day) to all meals and snacks consumed by CCLaS (ROI) and NDNS (NI) participants respectively for males and females. In both jurisdictions between 20% and 25% of all food and beverages consumed in an average day comprises of foods high in fats, sugars and salt. In CCLaS the top three food groups contributing the largest proportion to meals and snacks were ‘milk, yoghurt and cheese’, followed by ‘foods and drinks high in fat, sugar and salt’, and ‘vegetables, salad and fruit’. Proportional contribution of ‘wholemeal cereals, breads, pasta and rice’ ($P=0.005$), ‘milk,

yoghurt and cheese' ($P=0.012$), and 'meat, poultry, fish, eggs, beans and nuts' ($P=0.027$) were greater for meals and snacks consumed by males, compared with females (figure 6). In NDNS, similar to the *CCLaS* dietary data, the top three food groups contributing the largest proportion to meals and snacks were 'dairy and alternatives', followed by 'eat less often and in small amounts', and 'fruit and vegetables'. Proportional contribution of 'dairy and alternatives' ($P=0.000$) and 'beans, pulses, fish, eggs, meat and other proteins' ($P=0.034$) were greater for meals and snacks consumed by males, compared with females (figure 7).

Figure 6: Relative median proportional contribution of food groups for all meals and snacks (CCLaS)

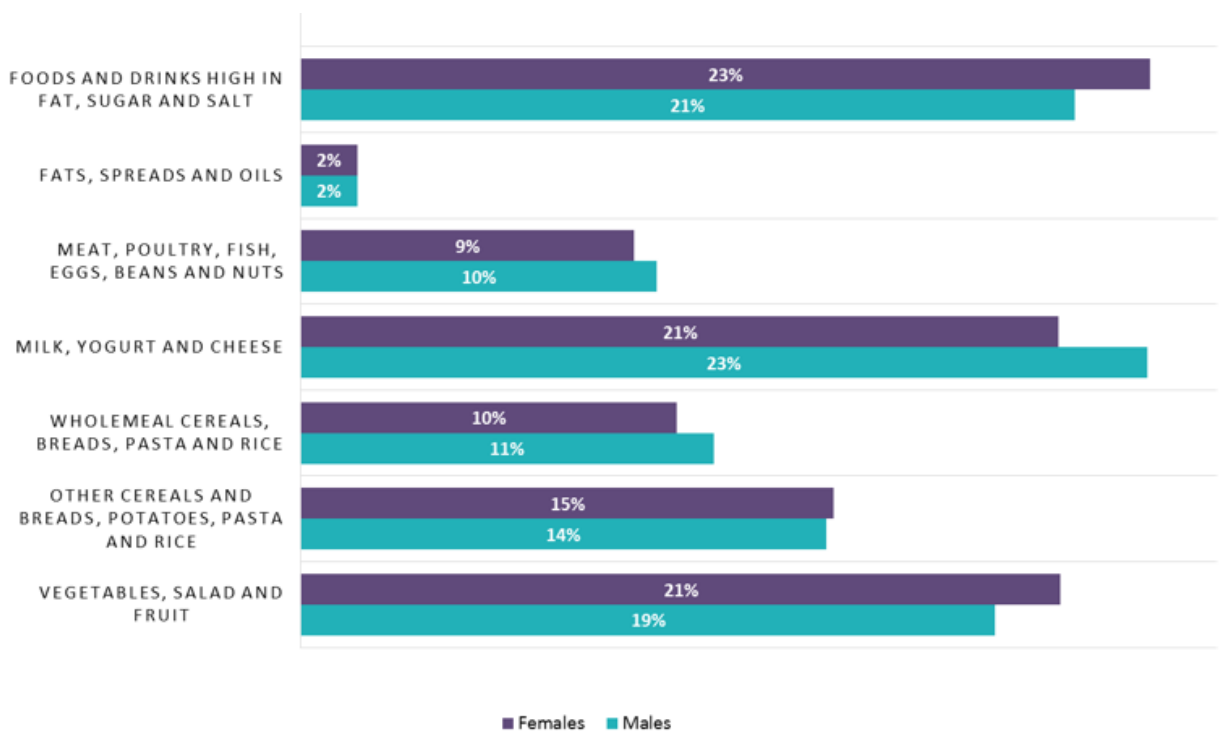
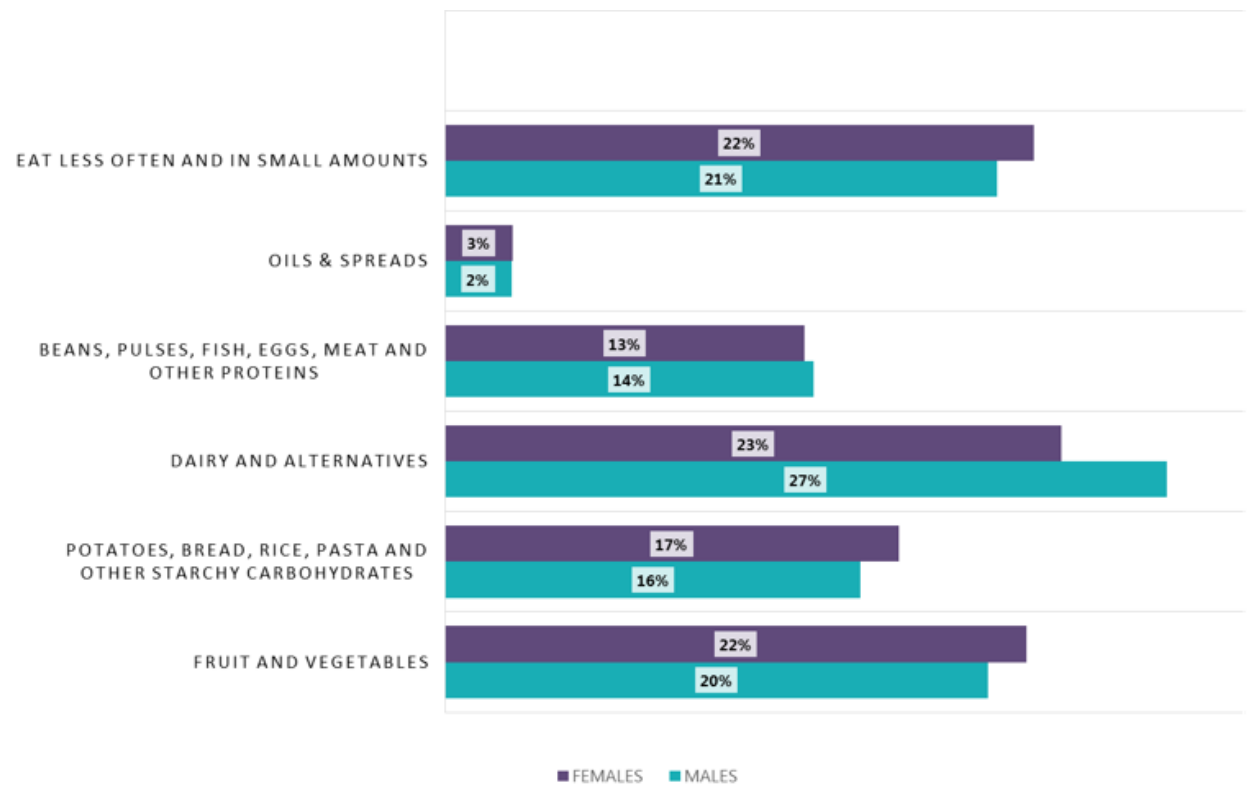


Figure 7: Relative median proportional contribution of food groups for all meals and snacks (NDNS)



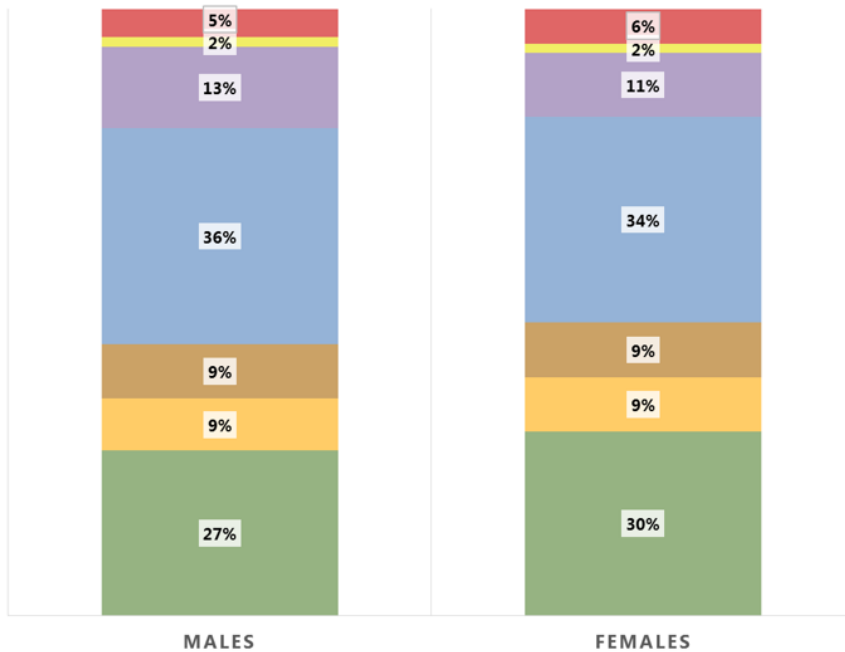
With the exception of breakfast approximately 20-25% of each eating occasion constituted foods recommended to consume in small amounts or to 'eat less often' (Figure 8). However afternoon and evening snacks contained between 21% and 29% of these foods in ROI and 23% and 37% in NI (Figure 9).

Figure 8: Proportional contribution of each food group to breakfast, lunch and evening meal for children in ROI and NI.

RELATIVE MEDIAN PROPORTIONAL CONTRIBUTION OF FOOD PYRAMID FOOD GROUPS

BREAKFAST

- FOODS AND DRINKS HIGH IN FAT, SUGAR AND SALT
- FATS, SPREADS AND OILS
- MEAT, POULTRY, FISH, EGGS, BEANS AND NUTS
- MILK, YOGURT AND CHEESE
- WHOLEMEAL CEREALS, BREADS, PASTA AND RICE
- OTHER CEREALS AND BREADS, POTATOES, PASTA AND RICE
- VEGETABLES, SALAD AND FRUIT



RELATIVE MEDIAN PROPORTIONAL CONTRIBUTION OF EATWELL GUIDE FOOD GROUPS

BREAKFAST

- EAT LESS OFTEN AND IN SMALL AMOUNTS
- OILS & SPREADS
- BEANS, PULSES, FISH, EGGS, MEAT AND OTHER PROTEINS
- DAIRY AND ALTERNATIVES
- POTATOES, BREAD, RICE, PASTA AND OTHER STARCHY CARBOHYDRATES
- FRUIT AND VEGETABLES

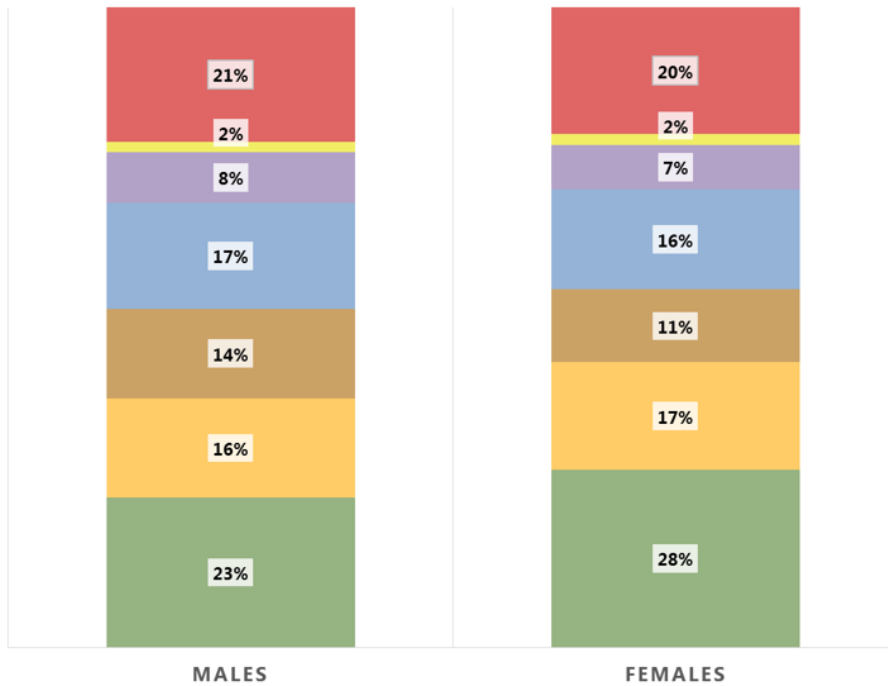


Fig 8 continued.

RELATIVE MEDIAN PROPORTIONAL CONTRIBUTION OF FOOD PYRAMID FOOD GROUPS

LUNCH

- FOODS AND DRINKS HIGH IN FAT, SUGAR AND SALT
- MEAT, POULTRY, FISH, EGGS, BEANS AND NUTS
- WHOLEMEAL CEREALS, BREADS, PASTA AND RICE
- VEGETABLES, SALAD AND FRUIT
- FATS, SPREADS AND OILS
- MILK, YOGURT AND CHEESE
- OTHER CEREALS AND BREADS, POTATOES, PASTA AND RICE



RELATIVE MEDIAN PROPORTIONAL CONTRIBUTION OF EATWELL GUIDE FOOD GROUPS

LUNCH

- EAT LESS OFTEN AND IN SMALL AMOUNTS
- OILS & SPREADS
- BEANS, PULSES, FISH, EGGS, MEAT AND OTHER PROTEINS
- DAIRY AND ALTERNATIVES
- POTATOES, BREAD, RICE, PASTA AND OTHER STARCHY CARBOHYDRATES
- FRUIT AND VEGETABLES

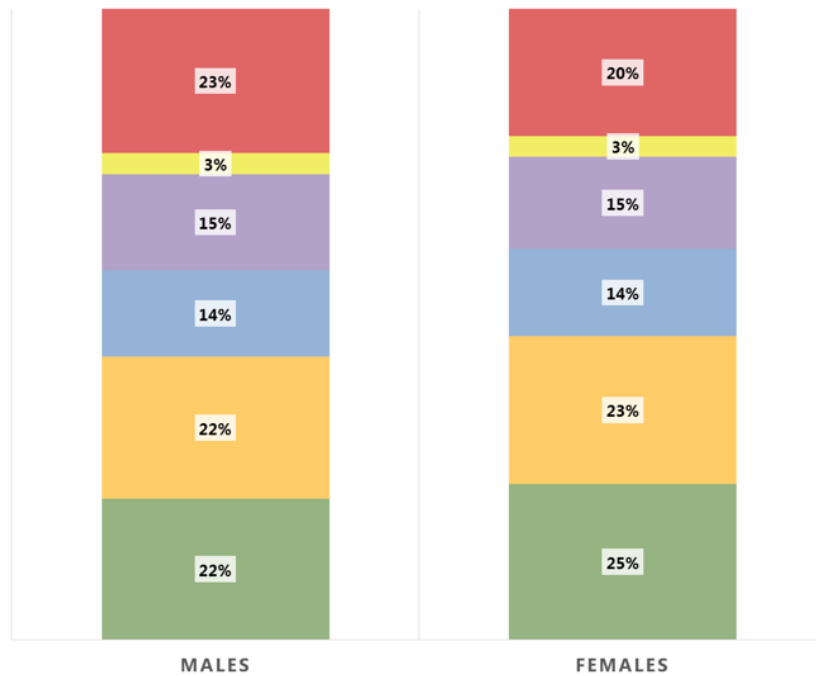
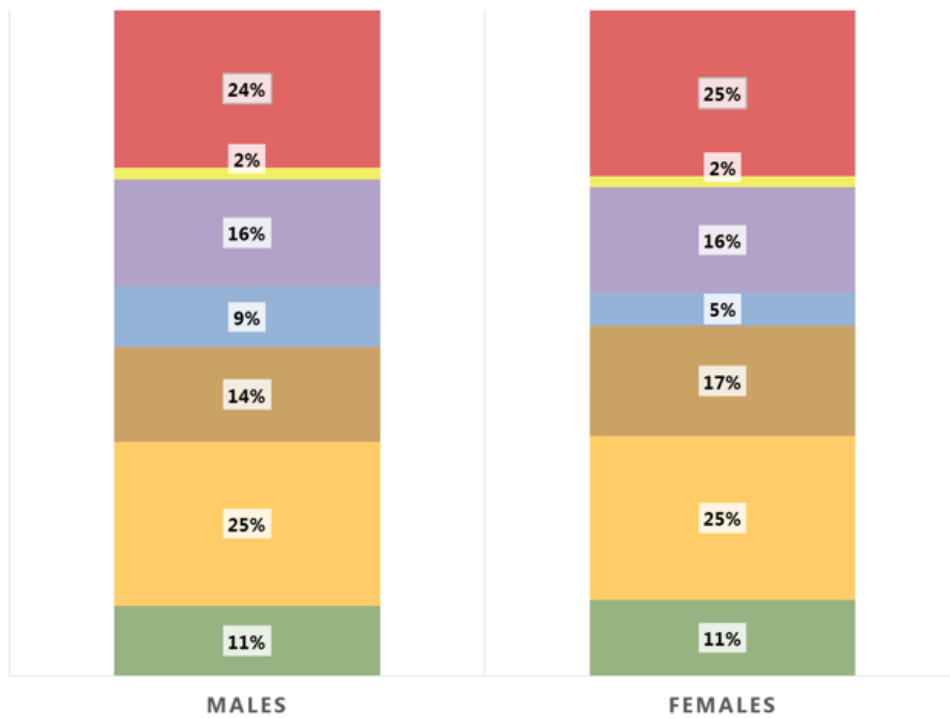


Fig 8 continued.

RELATIVE MEDIAN PROPORTIONAL CONTRIBUTION OF FOOD PYRAMID FOOD GROUPS

EVENING MEAL

- FOODS AND DRINKS HIGH IN FAT, SUGAR AND SALT
- MEAT, POULTRY, FISH, EGGS, BEANS AND NUTS
- WHOLEMEAL CEREALS, BREADS, PASTA AND RICE
- VEGETABLES, SALAD AND FRUIT
- FATS, SPREADS AND OILS
- MILK, YOGURT AND CHEESE
- OTHER CEREALS AND BREADS, POTATOES, PASTA AND RICE



RELATIVE MEDIAN PROPORTIONAL CONTRIBUTION OF EATWELL GUIDE FOOD GROUPS

EVENING MEAL

- EAT LESS OFTEN AND IN SMALL AMOUNTS
- OILS & SPREADS
- BEANS, PULSES, FISH, EGGS, MEAT AND OTHER PROTEINS
- DAIRY AND ALTERNATIVES
- POTATOES, BREAD, RICE, PASTA AND OTHER STARCHY CARBOHYDRATES
- FRUIT AND VEGETABLES

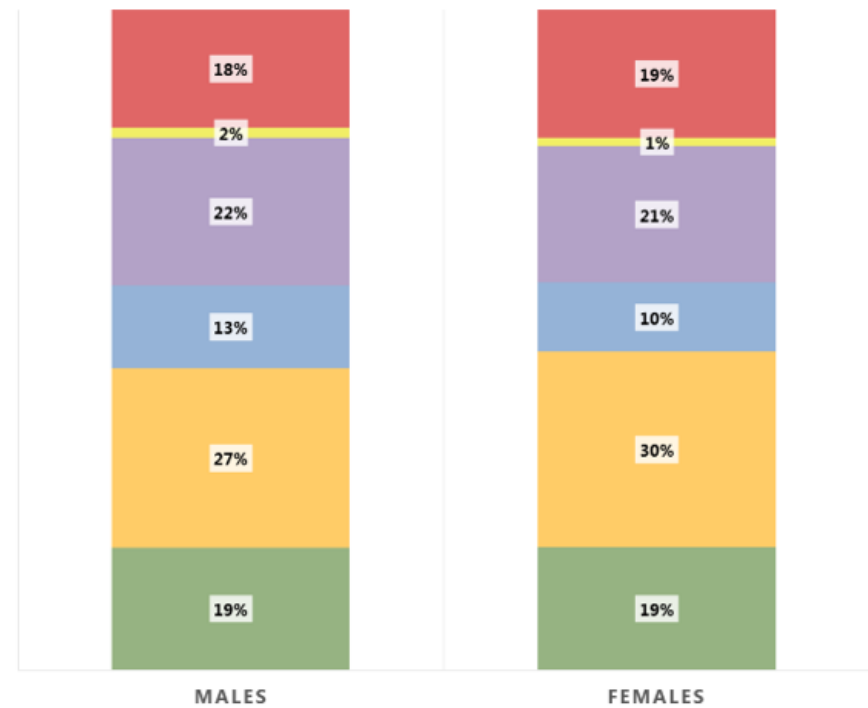
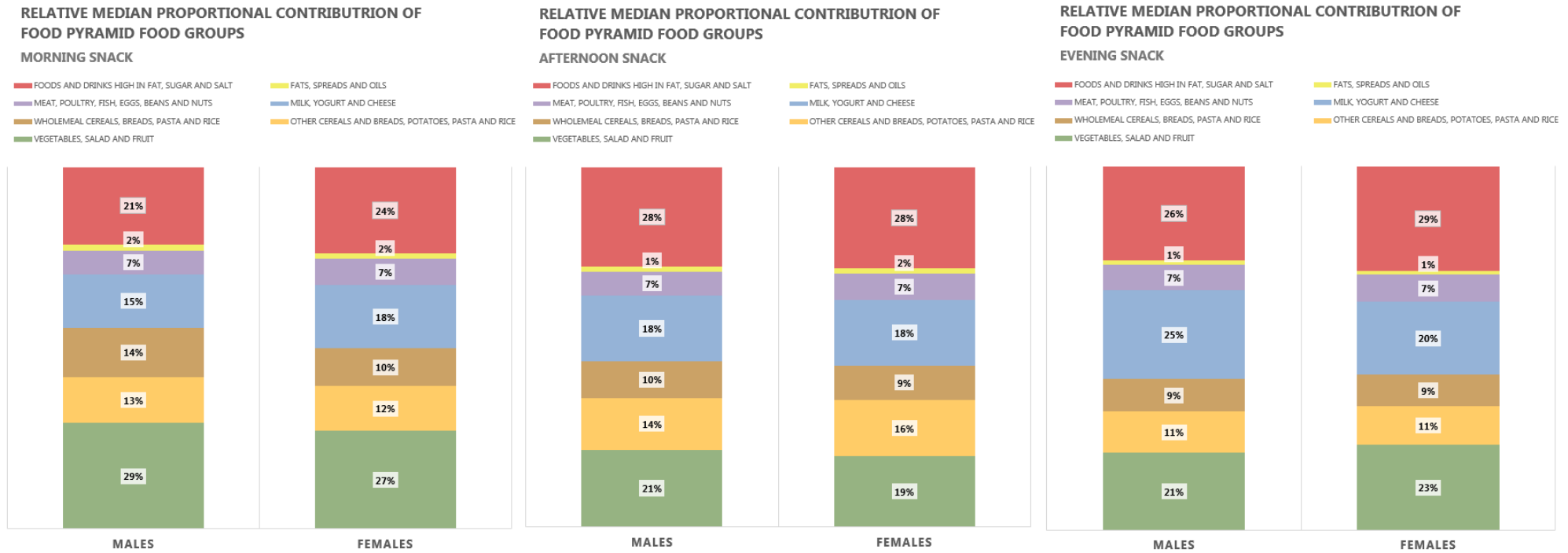


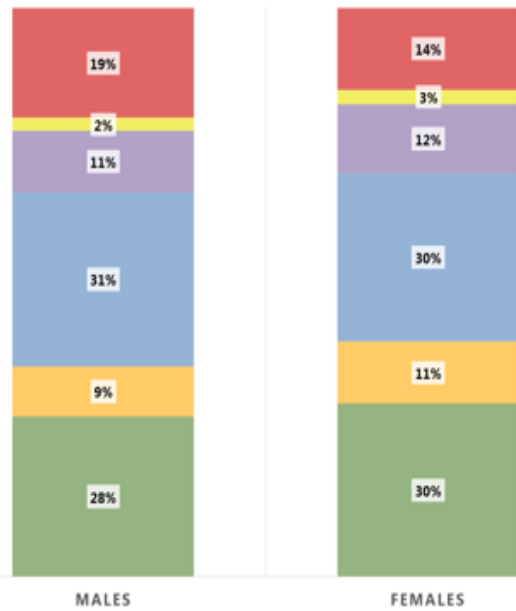
Figure 9: Proportional contribution of each food group to morning snack, afternoon snack and evening snack meal for children in ROI and NI



**RELATIVE MEDIAN PROPORTIONAL CONTRIBUTION OF
EATWELL GUIDE FOOD GROUPS**

MORNING SNACK

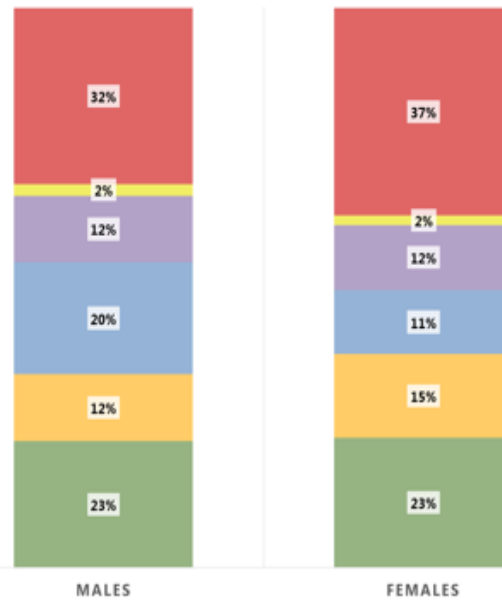
- EAT LESS OFTEN AND IN SMALL AMOUNTS
- OILS & SPREADS
- BEANS, PULSES, FISH, EGGS, MEAT AND OTHER PROTEINS
- DAIRY AND ALTERNATIVES
- POTATOES, BREAD, RICE, PASTA AND OTHER STARCHY CARBOHYDRATES
- FRUIT AND VEGETABLES



**RELATIVE MEDIAN PROPORTIONAL CONTRIBUTION OF
EATWELL GUIDE FOOD GROUPS**

AFTERNOON SNACK

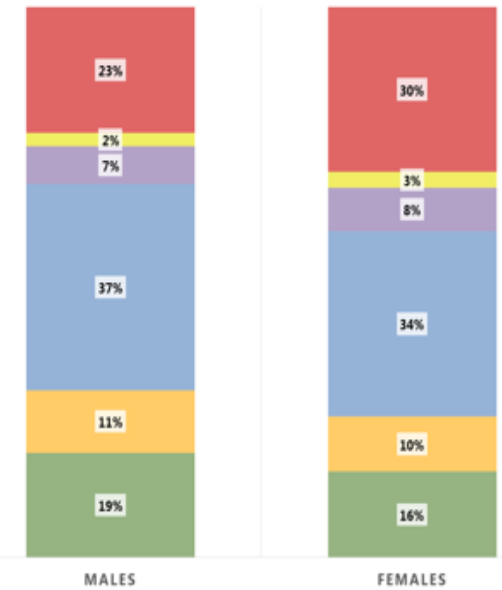
- EAT LESS OFTEN AND IN SMALL AMOUNTS
- OILS & SPREADS
- BEANS, PULSES, FISH, EGGS, MEAT AND OTHER PROTEINS
- DAIRY AND ALTERNATIVES
- POTATOES, BREAD, RICE, PASTA AND OTHER STARCHY CARBOHYDRATES
- FRUIT AND VEGETABLES



**RELATIVE MEDIAN PROPORTIONAL CONTRIBUTION OF
EATWELL GUIDE FOOD GROUPS**

EVENING SNACK

- EAT LESS OFTEN AND IN SMALL AMOUNTS
- OILS & SPREADS
- BEANS, PULSES, FISH, EGGS, MEAT AND OTHER PROTEINS
- DAIRY AND ALTERNATIVES
- POTATOES, BREAD, RICE, PASTA AND OTHER STARCHY CARBOHYDRATES
- FRUIT AND VEGETABLES

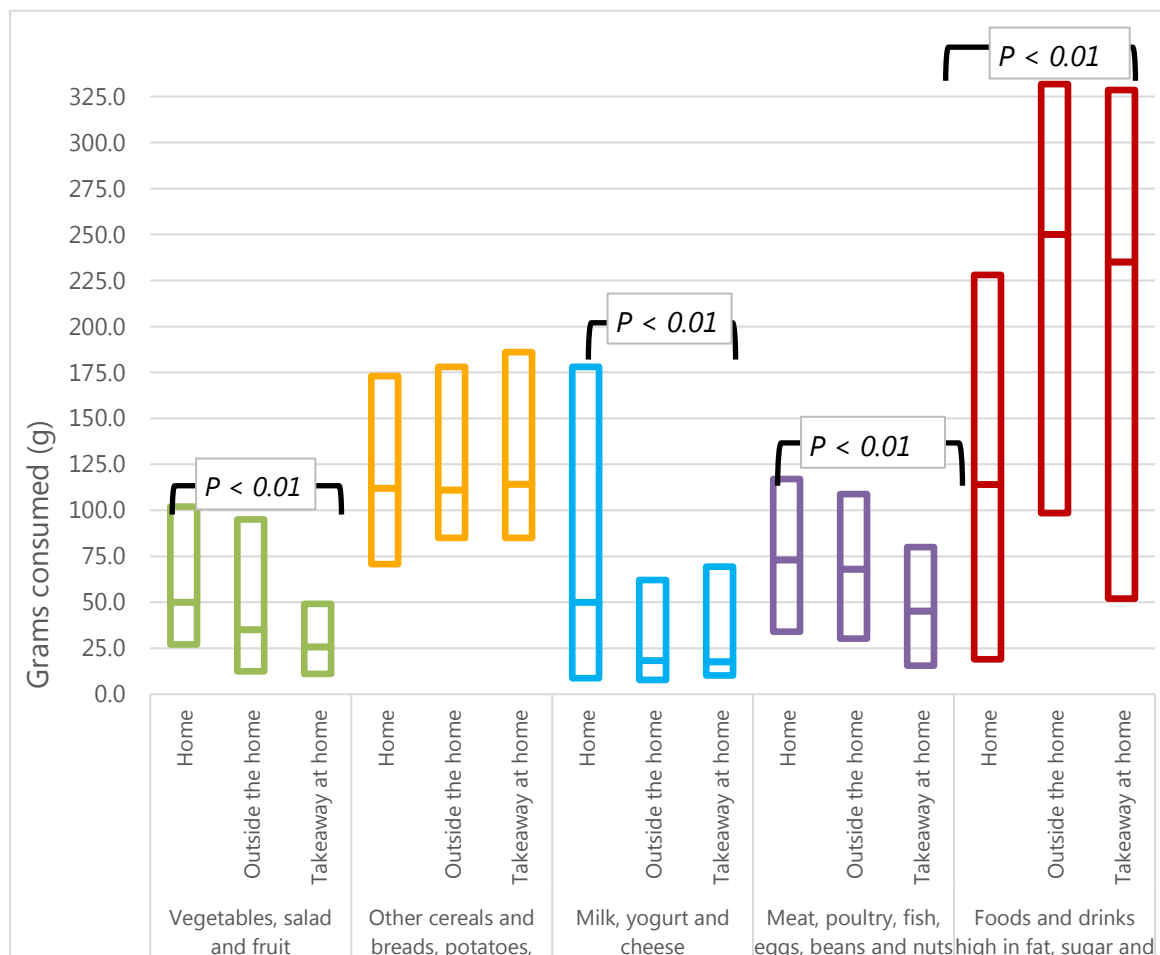


Evening meal consumption outside of home

Overall the majority of participants consumed their evening meal at home on weekdays (85% and 91%) for ROI and NI participants respectively these proportions decreased at weekend days (77% and 83%).

The food group contribution to evening meals eaten at home compared to those eaten outside home differ significantly in both ROI (Fig 9) and NI (Fig 10). Significant differences in the amounts of food and beverages (portion sizes) consumed by *CCLaS* participants in total ($P < 0.001$), and from the food groups ‘meat, poultry, fish, eggs, beans and nuts’ ($P = 0.002$) and ‘foods and drinks high in fat, sugar and salt’ ($P < 0.001$), are evident. Compared with evening meals at home, median portion sizes of all foods and beverages consumed (total), and of ‘meat, poultry, fish, eggs, beans and nuts’ and ‘foods and drinks high in fat, sugar and salt’, were larger when consumed outside the home or as takeaways eaten at home.

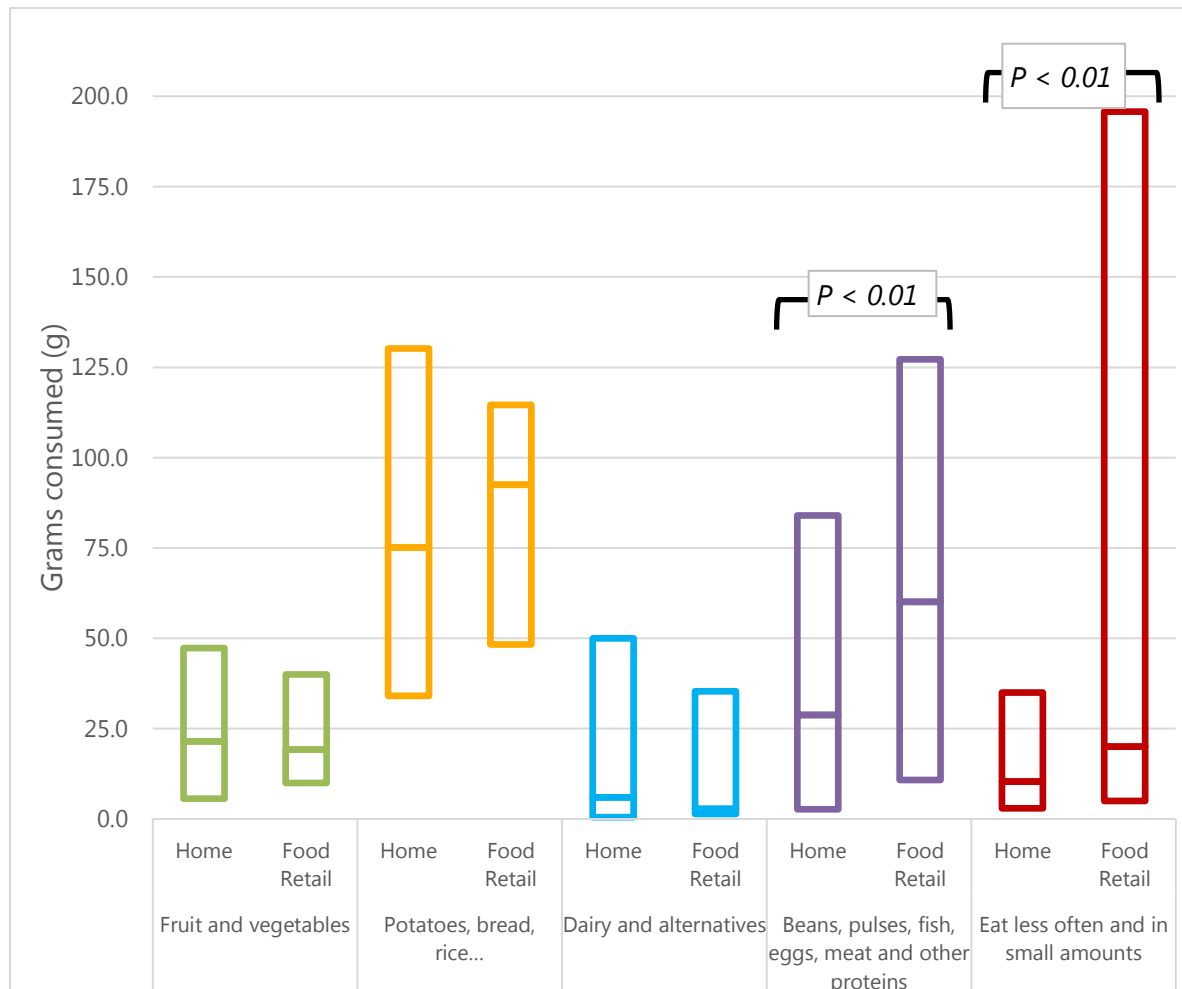
Figure 10: Consumption of food groups for evening meals eaten at home, outside the home or takeaway eaten at home (ROI data)



Similarly, significant differences in the amounts of food and beverages (portion sizes) consumed by *NDNS (NI)* participants in total ($P < 0.001$), and from the food groups ‘beans, pulses, fish, eggs, meat and other proteins’ ($P < 0.001$) and ‘eat less often and in small amounts’ ($P < 0.001$), differs by eating location.

Compared with evening meals at home, median portion sizes of all foods and beverages consumed (total), and of 'beans, pulses, fish, eggs, meat and other proteins' and 'eat less often and in small amounts', were larger when consumed in food retail outlets (i.e. coffee shops, cafés, shops, delis, sandwich bars, fast-food outlets, restaurants and pubs or night clubs) (Figure 10).

Figure 11: Consumption of food groups for evening meals eaten at home, outside the home or takeaway eaten at home (NI data)



6 Discussion

What are the key influencing factors on parental portioning practices?

There is limited information in the existing literature on child-feeding practices (20), however, results from the systematic review and the qualitative study with parents provide a useful insight into routine parental portioning practices. It was apparent from this research that mothers mostly serve food to children, although some male spouses also portioned meals. Parents generally serve a set amount of food to their children rather than permitting children to self-serve. There was limited evidence of children's involvement in cooking, choosing or serving portions. Exceptions to this include children being allowed to serve themselves healthy snacks, specific evening meals such as fajitas or homemade pizza and breakfast at the weekends if the child is capable of doing so. Parents observed that when their children serve themselves on these occasions, they serve a similar amount to what they would serve them, suggesting that children learn the portion sizes to serve themselves from their parents. This is consistent with research that suggests that parents shape their children's eating behaviour (17, 18).

It was apparent from this research that parents are more concerned about the type of food they feed their children, rather than the amount. Parents main concern regarding the amount that they feed their children is to ensure that they are fed a sufficient amount. Portion sizes are based on each child's individual appetite and through learning from experience how much they will eat. Parents' often portion out these learned amounts of food on smaller sized plates which help them to control the amount that they are serving. Parents use their child's body size as an indicator that their child is healthy and that the portion sizes that they provide are appropriate. This is somewhat concerning given the evidence to suggest that parents frequently misperceive their children's (and their own) weight status. In particular, parents of children with overweight and obesity fail to perceive their child as of normal weight (54, 55). As parents want to encourage their children to eat a healthy diet, they allow larger amounts of foods perceived to be healthy and give smaller amounts of foods perceived to be less healthy.

These findings are in line with previous qualitative research exploring parental views on child feeding practices. Previous research has also suggested that parents want to ensure that their child is fed and has 'enough' to eat(31, 32) that parents feel that each child is individual in terms of the portion size that they need (33, 35), that parents learn the portion size that their child will eat(32, 33, 36, 37), that parents serve portions using child-sized dishware(38, 39), that parents use their child's body size as an indicator of their health(31, 32, 35, 40) and that the perceived healthiness of a food dictates the portion size that parents give(33, 36-39).

Further factors that affect parental portioning practices were observed in this research that are not as commonly discussed in the literature. A few parents mentioned that they do not feed their children large portions to avoid building up their appetite and therefore causing over-eating and promoting weight gain. This suggests that parental knowledge can influence portioning practices, which emphasises the importance of providing education to parents on appropriate portion sizes for children. Family influences on portion size were apparent as it was discussed by some mothers that male spouses and grandparents regularly serve food to their children and serve larger portion sizes than they would serve. Male spouses and grandparents could be a potential target for child portion size guidance. Interestingly, parents often reflected on their childhood experiences of being fed by their parents and how this has influenced the way in which they feed their own children, such as not forcing their children to finish a meal as they would have been expected to do. This again emphasises the value in targeting grandparents with child portion size guidance. Important food policy considerations were also highlighted when discussing food eaten outside the home, as parents felt that children's meals served in restaurants are a much larger portion than what they would serve to their children at home. This is particularly significant for urban areas in the ROI, where participants reported a greater frequency of eating outside the home compared to rural areas and NI. Additionally, parents mentioned that when buying pre-packaged foods in the supermarket, that they would be influenced to buy larger portion sizes as they are sold at a lower cost.

What are parent's views on portioning size guidance?

Parents had some awareness of healthy eating guidelines such as the Eatwell Guide (NI) or the Food Pyramid (ROI), however knowledge on child portion size was limited. It was evident that parents felt that they know how much food their children need. Yet they did, however, feel that portion size guidance would be useful to use as a gauge and to reassure them that they are not under- or over-feeding their child. They highlighted that this information would need to be flexible as children are individual and have different appetites. Therefore guidance on feeding children with larger or smaller appetites would be helpful. Information could be presented pictorially on child sized plates as several parents serve their children food on child sized plates and could include household measures rather than weights as parents highlighted that this would be more practical. Television, social media or print media were suggested by parents as the best way to deliver portion size guidance. Parents felt that guidance would be most useful when their child starts pre-school, as at this stage it becomes less clear how much to feed them. They discussed that information on how their child's portion size requirements change with age would be helpful. Currently the Food Pyramid (ROI) is for those 5 years and older and the Eatwell Guide (NI) is for those aged 2 years up, with no specific guidance for different age groups. It was apparent that first time parents would be most receptive to this information. Parents suggested that it would be beneficial to target children themselves with portion size guidance through school but felt strongly that information should be presented in a positive way, focusing on health rather than body size and image. While this research suggests that mothers mostly take responsibility over child feeding, as previously stated, fathers and grandparents should also be targeted in portion size communication strategies. Furthermore,

parents, particularly in NI, mentioned that nutrition messages are inconsistent and constantly changing. Portion size guidance, therefore needs to be clearly evidence based to encourage parents to follow it. Future research is needed to assess the impact of providing this suggested portion size guidance to parents on actual portioning practices. In reality, the findings reported here present ‘maternal’, rather than ‘parental’, portioning practices, due to the dominance of female subjects studied. This also signifies however, that females continue to dominate in child feeding roles.

Given participants limited knowledge of appropriate portion sizes for both children and themselves as reported in this research, educational strategies may moderate portion sizes served to children as an obesity prevention measure. Parent’s self-efficacy in serving appropriate portion sizes can be increased by engaging parents in practical food preparation tasks that generate discussions and sharing of experiences regarding portioning for their children and others (56, 57). Parents can learn to estimate portion sizes more accurately through interactive group sessions using physical food models (58). Children also can be trained to more accurately estimate portion sizes by making sequential comparisons between foods, measuring cups, and other portion size aids (e.g. golf ball, baseball) (59). This is supported by the WHO recommendations for ending childhood obesity; “Require inclusion of nutrition and health education within the core curriculum in schools” and “make food preparation classes available to children, their parents and caregivers” (60).

What and how much are children eating on the island of Ireland?

While the qualitative research presented in previous sections indicated the drivers of why and how parents portion food for their children the secondary analyses of the CCLaS (ROI) and NDNS (NI) datasets provided the opportunity to explore the quantities of food consumed from each food group, as reported by the children and parents when the child was incapable of completing themselves.

Boys ate larger portions of dairy and protein foods than girls for all meals and snacks in both surveys.

Of concern, it was found that almost one-quarter of meals and snacks included foods and drinks not recommended as part of a healthy diet – they made up an average of 20% and 22% of the meals and snacks for boys and girls, respectively.. Similarly, ‘eat less often and in small amounts’ (*Eatwell Guide*) comprised 21% and 22% of *NDNS (NI)* males and females diets, respectively. A high intake of these foods and beverages, particularly in larger portion sizes, increases the risk of over-consumption of dietary energy and risk for overweight and obesity in children (22), but also displaces intake of more nutrient-dense foods in the diet and increases the risk of other diet-related conditions, such as dental caries.

Childrens breakfasts, primarily comprised ‘milk, yoghurt and cheese’ (*Food Pyramid*) and ‘dairy and alternatives’ (*Eatwell Guide*), followed by ‘vegetables, salad and fruit’ (*Food Pyramid*) and ‘fruit and vegetables’ (*Eatwell Guide*). In both samples, this was primarily due to consumption of plain milks and 100% fruit juices at breakfast. Skipping breakfast was rare (2.4% of food diary days) among *CCLaS(ROI)*

participants, although more frequent (42.1%) among *NDNS (NI)* participants – likely a reflection of the different age ranges of participants from the two surveys.

Approximately a quarter of lunches comprised of ‘vegetables, salad and fruit’ (*Food Pyramid*) and ‘fruit and vegetables’ (*Eatwell Guide*), but a further one-quarter comprised of ‘foods and drinks high in fat, sugar and salt’ (*Food Pyramid*) and ‘eat less often and in small amounts’ (*Eatwell Guide*) e.g. biscuits, soft drinks, fruit drink concentrates, chocolate, sugar, and sweet spreads (e.g. jam, honey, Nutella), crisps and savoury snacks, buns, cakes and pastries. Similarly, evening meals comprised approximately one-quarter ‘other cereals and breads, potatoes, pasta and rice’ (*Food Pyramid*) and ‘potatoes, bread, rice, pasta and other starchy carbohydrates’ (*Eatwell Guide*). Evening meals of *CCLaS* participants comprised a further one-quarter of ‘foods and drinks high in fat, sugar and salt’ (*Food Pyramid*) e.g. soft drinks, fruit drink concentrates or cordials and sauces (ketchup and mayonnaise). Evening meals of *NDNS (NI)* participants however, comprised a lower one-fifth of ‘eat less often and in small amounts’ (*Eatwell Guide*) e.g. soft drinks, chocolates, crisp, savoury snacks and ice cream, and rather more foods from ‘beans, pulses, fish, eggs, meat and other proteins’ (*Eatwell Guide*).

Larger portion sizes, particularly of foods and beverages high in salt, fats and sugars, were consumed at evening meals eaten outside the home and, in particular, when purchased as takeaway to eat at home. Additionally, smaller portion sizes of ‘vegetables, salads and fruits’ (*Food Pyramid*) and ‘fruit and vegetables’ (*Eatwell guide*) were consumed outside the home. While frequency at which evening meals were eaten outside the home was low in both surveys, differences in portion sizes consumed were substantial and frequency of eating meals outside the home or as takeaways will likely be higher in sub-groups of these populations.

Snacks consumed in the mornings were generally healthier, comprising primarily ‘vegetables, salad and fruit’ (*Food Pyramid*) and ‘fruit and vegetables’ (*Eatwell Guide*), as well as ‘dairy and alternatives’ (*Eatwell Guide*) for *NDNS (NI)* participants. However, afternoon and evening snacks comprised a higher proportion of ‘foods and drinks high in fat, sugar and salt’ and ‘eat less often and in small amounts’ (*Eatwell Guide*), as well as ‘dairy and alternatives’ (*Eatwell Guide*) for *NDNS (NI)* participants.

Although the key findings between *CCLaS (ROI)* and *NDNS (NI)* datasets are very similar the differences in the age range of each dataset should be accounted for as *CCLaS (ROI)* is a survey of children aged between 8 and 11 whereas *NDNS (NI)* surveyed children aged 1.5 to 18 years old. *NDNS (NI)* could not be split into narrower age ranges due to the small number of participants, therefore a more direct comparison dependant on age groups could not be made.

7 Conclusions and recommendations

Understanding how parents portion food for their children, the drivers of these practices and the type of information parents are receptive to will help inform future interventions and information campaigns to help parents understand child portion sizes. From this research it is evident that parents main concern regarding the amount that they feed their children is that their child eats enough to be fed. This amount is something that parents learn through experience of feeding their children and is highly specific to the appetite of each individual child.

The amount of food and drinks high in fat, sugar and salt in the diets is a major issue. There is a clear need to encourage and support a reduction in the proportion and portion sizes of foods and beverages high in fat, sugar and salt, focussing in particular on snacks consumed by children in the afternoon and evening. One such approach is to promote healthier snack alternatives. In addition it was clear that a large proportion of starchy carbohydrates are not wholemeal thereby limiting fibre intake.

Recommendations

A number of recommendations are propose including those aimed towards encouraging better portioning practices for parents and children and those aimed at improving the quality and balance in children's diets:

- Children's food portion guidance should be visual (pictorial), practical (use household items not weighing scales) and provide for a number of different age groups
- Food portion guidance should be targeted at key transition points in child development eg pre-school years and when the child starts primary school
- Food portion size awareness campaigns should be targeted and relevant to fathers and grandparents/other carers as well as to mothers
- Families should be encouraged to increase child involvement and autonomy in food preparation and serving of both meals and snacks
- Behaviour change campaigns should promote the replacement of foods and drinks high in salt, fats and sugars in children's diets with food groups essential to a healthy diet
- Behaviour change campaigns should promote the reduction of children's portion sizes of foods and drinks high in fat, sugar and salt, in particular promote a reduction in the portion sizes and frequency of these foods and beverages consumed as snacks
- Targeted messaging relating to snacking is warranted including reference to suitable foods and drinks, when they are given and strategies around snacking

- Behaviour change campaigns should promote parental awareness of the portion size and nutrient quality of foods and drinks produced outside of the home (both foods eaten out and foods from takeaways)
- The impact/effectiveness of these measures on child feeding practices should be monitored

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9 Appendices

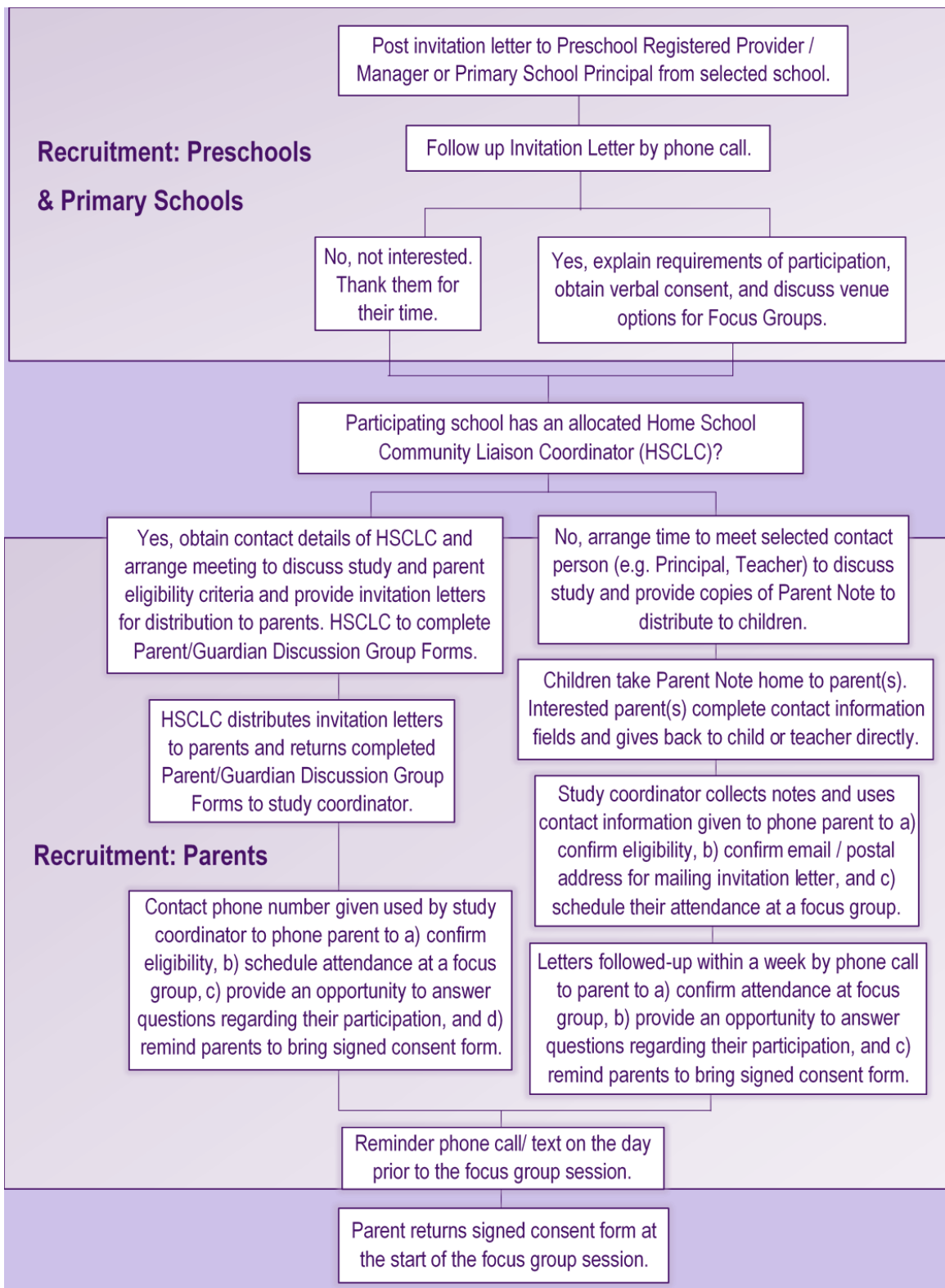
Appendix 1: Qualitative Study Recruitment Procedures

Recruitment procedure

Figure 1 illustrates the procedure by which schools and parents were recruited into the study.

Selected primary schools and preschools were mailed an invitation letter to participate, followed by a phone call within the week. Where a selected school declined to participate, another school was selected based on their geographic location (rural or urban) and level of deprivation (high or low) in attempt to recruit a balanced number of schools within these criteria. For schools agreeing to participate, a meeting was arranged with a nominated contact person (e.g. Principal, Manager, or Teacher) or, in ROI only, with the school Home School Community Liaison Coordinator (HSCLC). In ROI, most *DEIS* schools have an allocated HSCLC whose role it is to facilitate and encourage partnerships between parents and teachers, primarily through home visits with parents. Where such a liaison person was not available in the school, a *Parent Note* was sent home via children to their parents. Interested parents could then provide their contact details on this *Parent Note* and return it either directly to the teacher or via their child. As reimbursement, preschools and primary schools in ROI were offered a fruit and vegetable education and tasting session to be held at the school. NI schools were not offered an incentive for participation.

Parents interested in participating were provided written information about the study and consent form to sign, eligibility was confirmed and attendance at a focus group confirmed. Each parent was sent an SMS text reminder the day prior to confirm attendance. Each participating parent was reimbursed for their time in attendance with a €10 grocery gift card in ROI and a £10 multi-store voucher in NI. Parent recruitment ceased once the research team were satisfied data saturation was reached, determined on the basis of scope and replication (61).



Data collection

Focus groups were conducted between November, 2017 to April, 2018. Focus groups were held on school grounds or in a neighbouring community centre either in the morning or evening to facilitate parent attendance. Parents arriving to a focus group session were offered refreshments and a copy of the *Participant Questionnaire* (Appendix 1) to complete, and signed consent forms were collected. Moderators conducted each focus group according to the *Discussion Guide* (Appendix 2) and ‘probed’ (sought clarification) for further details where topics were unclear. In ROI groups, assistant moderators recorded all non-verbal communication among participants in the group, spontaneous reactions to ideas expressed, and main ideas arising from each group. In NI, the moderator recorded this information following the session. Each focus group was audio-recorded using a digital voice recorder (Olympus VN-732PC (ROI) and Sony IC Recorder ICD-PX333 (NI) and transcribed verbatim.

This **protocol for data collection** was piloted at two focus groups with a convenience sample of university staff and students to ensure the appropriateness, comprehension and acceptability of both the *Participant Questionnaire* and *Discussion Guide*. To recruit this convenience sample, an email was sent to all students via ‘surveys@umail.ucc.ie’ as well as ‘All Exchange Users’ and ‘All Staff’ list serves and a flyer and poster placed within the Mature Student’s Office at UCC. As a result of piloting, the following changes were made to the *Participant Questionnaire*: portion size images were changed to provide a consistent format (i.e. one food or beverage type in four portion size options) and frequency options were added, the question on ethnic / cultural background was converted to an open ended response, and the option of ‘both mother and father’ was added to the question on who usually serves main meals. Additionally, Vignette 2 in the *Discussion Guide* was changed from information provided by a practice nurse to an advertisement viewed at home, as participants did not find the initial scenario applicable to themselves.

The Participant Questionnaire was administered to each participating parent prior to the focus group. Questions covered participants’ age, gender, number and characteristics of children, ethnic/cultural background, education level, occupation status, and food security. Sources of questions were the 2016 population Census and six-item US Household Food Security scale module (62, 63) . In addition, food and beverage portion size photographs from the Young Persons’ Food Atlas were included to measure usual portion sizes served to children, as well as prime participants’ for discussing food and beverage portion sizes served to children. Completed questionnaires were anonymised by replacing participants’ names with a unique participant ID. Each focus group similarly was allocated a unique ID.

The Discussion Guide was a semi-structured topic guide including qualitative vignettes designed by the research team. These vignettes provided brief hypothetical scenarios that resembled realistic parenting situations in regards to portioning foods and beverages for children (Appendix 2). Others have similarly used vignettes to explore other parenting-related child health issues such as the promotion of unhealthy foods to children and childhood immunisations (64, 65). Vignette 1 was designed to generate discussion

on family rules around plate clearing and second helpings at the evening meal, while Vignette 2 was designed to generate opinion on receiving information on appropriate portion sizes for children. As the purpose of this research is in informing future strategies to address portion sizes served to children, using the *Discussion Guide* we explored parents' *views* and *practices* across various food settings (e.g. home, food retail, schools), food and beverage types (e.g. staple versus treat foods), and eating occasions (i.e. breakfast, lunch, dinner and snacks).

Data analysis

Completed copies of the *Participant Questionnaire* were entered electronically and numerically coded in Microsoft Office Excel 2013. Data were then exported to SPSS version 24 (IBM Corp., NY, USA) for descriptive analysis, e.g. age range and gender of participants.

Transcribed data from each focus group (N = 24) were imported into qualitative data analysis software NVivo version 11 (QSR International Pty Ltd., Victoria, Australia). Participant names were anonymised, replaced with school attributes (i.e. geographic location, level of disadvantage). Transcriptions were coded guided by the three phases of thematic analysis outlined by Nowell *et al.* (66). Each phase of the thematic synthesis was independently assessed by co-author KMS.

Phase 1: Data familiarisation – focus group moderators SM and LK read all focus group transcripts and then conferred regarding the central ideas (including similarities and conflicts) arising from the data, to draft a coding manual for use in coding.

Phase 2: Data coding – each transcript was coded line-by-line by SM or LK deductively using codes from the developed coding manual. Data were coded simultaneously such that, as each new focus group was coded, new free codes were developed and existing codes revised or removed from the manual, through progressive discussions between the two coders. In this phase, negative cases (those which appear to contradict emerging explanations) were also identified and discussed.

Phase 3: Identifying themes – codes within the coding manual were then organised into mind-maps to identify themes. Only those themes that represented data from several participants were retained.

Themes identified were representative of NI and ROI groups and views were generally similar. Slight differences identified between NI and ROI groups are discussed throughout. There were no obvious differences in views between parents from schools located in different geographical locations or with different levels of deprivation.

Researcher characteristics

Focus group moderators were authors SM, VAW and LK, and research student intern CW. LK is a trained Dietitian experienced in the field of Public Health Nutrition. SM and VAW are Nutrition Research Assistants with experience of focus group methodology. Research student intern CW was a current student studying a Masters of Public Health with a background in business, entrepreneurship and hospitality. Assistant moderators to the focus groups were research student intern DMM, a current

student studying a Masters of Public Health with a background in law and healthcare. Funding source of the research (i.e. **safefood**) was disclosed to participants to emphasise the importance of the research in informing future campaigns and information provision to the general public.

Appendix 2: Focus group discussion guide

As participants are arriving...

1. Collect signed consent forms.
2. Offer water, tea, coffee, snacks.
3. Provide copy of Participant Questionnaire to sit down to complete.

Ready to begin... (5 minutes)

1. Thank participants for time and contribution.
2. Introduce group Moderator and Assistant (will be taking notes).
3. Ask to please turn phones off.
4. Remind what the research is about:

“We’re here to talk about the portions sizes your child/ren eat or drink at meals or as snacks, so the amount of food on their plate or drink in their cup. This includes the amounts you as their parent serve them at home, but also meals eaten outside the home like at a relative’s house or takeaway food bought and taken home to eat or served in other places like at pre-school / school. We use this group discussion method as often people think of things important to them by talking with someone else about it. You will also have experiences that are similar or different to each other. So sitting to talk about this as a group gives us more information than if we spoke with each of you individually.”

1. Explain recording, client viewing and confidentiality of participant information.
“As indicated in your consent form we will record the group discussion. The recording will only be used to help us with reporting the results of the study. Your personal information will remain confidential, and we will not keep or pass on any personal information about you. If you mention any identifying information such as the names of people in your family or where you live this is fine, we just want to remind you that the data will be made anonymous (that is, any identifying information will not be recorded in writing) and all recordings will be stored securely within the university and no identifying information about you will be reported in anything published on this study. So, just confirming everyone okay for our discussion to be recorded?”
2. Explain the importance of honest opinions
“Your views and experiences are important, so we would like you to tell us what you think about each of the topics we talk about. There are no right or wrong answers here to anything we’ll be discussing today, so it is important you provide us with your honest opinions and that you understand no one is judging you on your opinions. Please also allow others in the group to speak their minds openly with us. As we will be talking about your personal opinions and experiences, it is not necessary for everyone to agree with each other. It is more helpful for us to know the differences in opinions you have, as well as when you have the same opinions. You may also think of things that I don’t mention so please share anything that comes to mind for you in the discussion, even if you think it may not be relevant. It is also important that you know that everything that we talk about today is treated with confidence, and

we expect that you will also treat anything that you hear in the discussion with confidence, so what is said in the group, stays in the group.”

Introduction (10 mins)

So, to help us feel more comfortable talking with the group, I'd like to start by telling each other a bit about ourselves such as your first name, where you live, and a bit about your home situation, like who lives with you in your family, how old your child/ren are, and what an average day might look like for you.

Topics (40-50 mins)

How are foods and drinks served (i.e. given) to child/ren in your home?

- Thinking about Breakfast / Lunch / Evening Meal / Snacks
 - Who decides how much? Why? (Parent versus Child)
 - When would you versus others at home serve foods or drinks to your child/ren?

Vignette 1 (Primary School)

Jack is the father of Aoife, a 7-year-old girl. It's dinner time, and Jack has put chicken drumsticks on the table with potato mash, carrots and peas. Jack takes two drumsticks and places them on Aoife's plate as well as a scoop of mash and a few spoonfuls each of peas and carrots. Aoife eats the drumsticks and a bit of the mash but none of the peas and carrots. Aoife then asks for more of the chicken drumsticks.

- How is this similar / different to experiences you have had?
- What have you done in these situations?

Vignette 1 (Pre-School)

Jack is the father of Aoife, a 2-year-old girl. It's dinner time, and Jack has put chicken drumsticks on the table with potato mash, carrots and peas. Jack takes one drumstick and places it on Aoife's plate as well as a scoop of mash and a spoonful each of peas and carrots. Aoife eats the drumsticks and a bit of the mash but none of the peas and carrots. Aoife then asks for more of the chicken drumsticks.

- How is this similar / different to experiences you have had?
- What have you done in these situations?

Think about the foods and drinks YOU serve to your child/ren at home. How do you choose how much to serve?

- What expectations (if any) do you set for your child(ren) at meal times? e.g. eating all that is served, second (or third) helpings.
- When might you serve your child/ren different amounts compared with their siblings / other household members (if at all)?
- How might your child/ren affect the amounts you serve them? (e.g. their mood, their behaviour (picky), their hunger...)
- Can you tell me about situations where you might serve different amounts to your child/ren (e.g. tiredness, hunger, time).
- Anything else that affects amounts you serve your child/ren? (e.g. type of food or drink, time of day, family schedule/time)

How do you physically portion foods or drinks for child/ren?

- Serve-ware, tupperware, plates/cups, pre-packaged items/packaging, zip-loc bags or paper/plastic bags
- Breakfast/Lunch /Dinner/Snacks

Thinking about others who serves foods or drinks to your child/ren?

- What do you think about the amounts they serve to your child/ren?
- How is this different to what you would serve?

Think now about other places your child/ren eat(s) outside of the home. What do you think about the amounts your child is served in these other places?

- Grandparents' homes
- Other relatives' homes
- Friends' homes (of family or child)
- At Preschool / School
- Eating out: Restaurants / Fast food / Cafes
- Takeaways (at home versus eaten outside the home)
- Supermarkets – pre-packaged items
- Anywhere else

Vignette 2

Claire is the mother of Sean a [5 or 10]-year-old-boy, and Maura a [3 or 6]-year-old-girl. Claire is at home and sees an advertisement on the television about food and drink portion sizes for children. Looking at some of the portion sizes shown Claire knows she gives Sean, her son, more than this and often he will ask for more. She would however, serve her young daughter much less than these.

How

- Have you experienced something similar/different to this situation with your child/ren?
- Would seeing something like this change the amounts you feed your child/ren? How?

would you feel receiving information / guidance on the amounts of food and drinks to serve your child/ren?

- What type of information, if any, do you think parents need on portion sizes for children, or is there enough?
 - Types of foods and drinks to include? (e.g. vegetables versus pizza)?
 - Foods/drinks portioned at home versus outside the home?
 - Pre-packaged items?
 - Child age or stage of development? Other characteristics?
 - Child independence in eating versus parent control?
- What mode of delivering this information would be most helpful?

Concluding discussion (5 mins)

1. Overall, what do you think were the most interesting things we spoke about?
2. What was the most important to you personally? To parents generally?

THANK PARTICIPANTS FOR THEIR TIME.

PROVIDE GIFT-CARD.

ANY QUESTIONS AFTER TODAY THEY CAN CONTACT ME.

Appendix 3: Snack Portion Sizes

CCLaS

All 936 participants included in the CCLaS sample recorded something for a snack, whether a morning, afternoon or evening snack, on at least one of their three recorded food diary days. Thus, the following analyses for evening meal consumption are based on all included participants (n=561 males, n=382 females) from CCLaS.

Table 6 presents the median portion sizes (Q_2) consumed in grams, with associated interquartile ranges ($Q_1 - Q_3$), for each food and beverage category consumed for snacks by CCLaS participants. Number and proportion of participants reporting having consumed foods or beverages from each category are also reported.

Food category ^a	Males (CCLaS)				Females (CCLaS)			
	<i>n=561</i>				<i>n=382</i>			
	Q ₁	Q ₂	Q ₃	n (%)	Q ₁	Q ₂	Q ₃	n (%)
Vegetables, salad and fruit								
Vegetables (salad and cooked)	19.0	34.0	48.2	113 (20.1)	20.5	32.5	48.0	139 (36.4)
Fruit	89.2	131.0	176.5	307 (54.7)	80.0	107.0	148.0	254 (66.5)
Fruit juices (100%)	150.0	200.0	250.0	114 (20.3)	150.0	200.0	244.0	89 (23.3)
<i>Recommended serve sizes: ½ cup cooked vegetables (78-80g^b), 1 bowl (1 cup) salad (55-180g^b), 1 bowl (1 cup) homemade vegetable soup (240-246g^b), 150mL unsweetened fruit juice (155.3g^c), 1 medium sized fruit (118-182g^b), 2 small fruits (70-176g^b), small fruits e.g. 10 grapes (30-82g^b)</i>								
Other cereals and breads, potatoes, pasta and rice								
White rice	129.5	142.5	196.0	20 (3.6)	70.0	118.5	194.3	21 (5.5)
White pasta	84.0	109.5	165.0	47 (8.4)	69.0	96.0	135.0	45 (11.8)
White breads	30.1	52.0	54.0	320 (57)	33.5	48.8	54.0	203 (53.1)
White rolls and wraps	48.3	67.0	89.0	244 (43.5)	45.0	66.0	89.0	164 (42.9)
Breakfast cereals	20.0	29.5	36.0	87 (15.5)	16.0	26.0	36.0	43 (11.3)
Potato chips	65.0	85.0	111.0	71 (12.7)	50.0	85.0	111.0	38 (9.9)
Savoury snacks (crackers, rice cakes, breadsticks)	15.8	21.3	46.0	176 (31.4)	16.0	24.0	43.0	155 (40.6)
Plain popcorn	20.0	30.0	51.5	75 (13.4)	15.0	30.0	53.0	45 (11.8)
Wholemeal cereals, breads, pasta and rice								
Brown/Wholemeal/Wholegrain breads	37.0	54.0	74.0	131 (23.4)	37.0	48.8	67.3	74 (19.4)
Brown rolls and wholemeal pitta breads	58.0	74.5	89.0	26 (4.6)	33.0	48.0	78.0	17 (4.5)
Wholegrain breakfast cereals	29.0	38.0	42.0	30 (5.3)	22.5	40.0	59.3	16 (4.2)
<i>Recommended serve sizes^b: 2 thin slices bread (58g^b), 1 ½ slices soda bread (57g^b), 1 pitta pocket (58g^e), 1/3 cup dry oats (27g^b), ½ cup muesli (41g^b), 1 cup flake type breakfast cereal (35g^b), 1 cup cooked rice, pasta, noodles or couscous (105-157g^b), 2 medium or 4 small potatoes (172g^b)</i>								
Milk, yogurt and cheese								
Semi-skimmed milks (plain)	112.0	154.5	217.0	118 (21)	63.0	130.1	200.0	86 (22.5)
Whole milks (plain)	134.0	174.0	226.0	161 (28.7)	79.8	140.0	219.8	108 (28.3)
Cheeses (plain cheddar or processed)	20.0	22.3	36.0	162 (28.9)	19.0	23.3	38.0	107 (28)
Whole milk yogurts	54.0	85.0	125.0	93 (16.6)	50.0	85.0	125.0	43 (11.3)
Reduced fat yogurts	52.5	85.0	120.0	39 (7)	50.0	57.5	120.0	30 (7.9)
Other yogurts (fromage frais)	40.0	45.0	80.0	51 (9.1)	40.0	40.0	60.0	43 (11.3)
Drinking yogurts	90.0	100.0	180.0	45 (8)	90.0	100.0	187.5	42 (11)

<i>Recommended serve sizes: 1 glass milk (206g^c), 1 carton yogurt (125g), 1 bottle yogurt drink (206g^c), 2 thumbs hard or semi-hard cheese (34g^b), 2 thumbs soft cheese (34g^b)</i>								
Meat, poultry, fish, eggs, beans and nuts								
Eggs	50.0	60.0	114.0	37 (6.6)	50.0	50.5	67.0	24 (6.3)
Red meats (pork, beef)	16.0	24.0	39.0	342 (61)	16.0	26.8	46.9	200 (52.4)
Chicken	28.0	50.0	74.0	92 (16.4)	25.0	44.3	73.0	69 (18.1)
Meat products (Chicken nuggets)	33.0	60.0	91.0	40 (7.1)	33.0	48.0	80.0	25 (6.5)
<i>Recommended serve sizes: 50-75g cooked lean beef, lamb, pork, mince or poultry, 100g cooked fish, soya or tofu, ¾ cup beans or lentils (149g^b), 2 eggs (88g^b), 40g unsalted nuts or seeds</i>								
Fats, spreads and oils								
Butters	4.0	6.5	10.0	217 (38.7)	4.0	5.0	9.0	117 (30.6)
Reduced fat margarines	4.0	6.0	10.0	144 (25.7)	4.0	5.0	9.0	109 (28.5)
<i>Recommended serve sizes: 1 portion pack reduced fat or light spread (7-10g^d), 1 teaspoon oil per person when cooking (13.8g^c).</i>								
Foods and drinks high in fat, sugar and salt								
Biscuits	19.0	30.0	44.0	264 (47.1)	17.0	24.0	34.0	177 (46.3)
Cakes	26.0	45.2	65.0	92 (16.4)	26.5	32.5	47.5	64 (16.8)
Pancakes	28.0	44.0	63.5	24 (4.3)	42.0	52.0	84.0	23 (6)
Scones and muffins	32.0	39.0	61.0	110 (19.6)	27.8	37.5	65.0	80 (20.9)
Ice creams	49.0	65.5	85.0	114 (20.3)	52.0	73.0	86.0	93 (24.3)
Jelly/Custards/Mousses	50.0	66.0	100.0	21 (3.7)	51.0	94.0	170.0	18 (4.7)
Soft drinks	201.0	275.0	426.5	173 (30.8)	152.0	225.0	312.5	103 (27)
Fruit drink concentrates, Cordials	163.5	228.0	288.0	169 (30.1)	150.0	202.0	266.7	115 (30.1)
Sugars, syrups and preserves	10.0	16.0	21.0	201 (35.8)	9.0	14.9	18.3	144 (37.7)
Chocolate confectionery	20.0	32.0	47.8	300 (53.5)	18.0	26.0	42.0	183 (47.9)
Non-chocolate confectionery	14.0	23.8	42.5	184 (32.8)	11.0	22.5	41.8	124 (32.5)
Potato crisps and corn chips	25.0	33.0	35.0	192 (34.2)	25.0	34.0	35.0	121 (31.7)
Cereal bars (e.g. Rice Krispies, Coco Pops, Cornflakes)	20.0	29.0	42.0	124 (22.1)	22.7	39.0	57.0	53 (13.9)
Other sauces (ketchup, mayonnaise)	7.0	10.0	18.0	77 (13.7)	8.3	12.5	16.0	57 (14.9)
Composite categories								
Pizzas	103.0	206.0	290.0	46 (8.2)	90.0	103.0	206.0	31 (8.1)

Drinking chocolate powders and flavour additions (e.g. Nesquick)	40.8	213.7	276.7	56 (10)	16.0	228.0	304.0	55 (14.4)
Homemade soups	136.0	172.0	229.0	30 (5.3)	136.0	165.0	210.0	20 (5.2)
Meal sauces (e.g. pasta, curry sauces, or Asian sauces)	16.0	32.0	73.0	37 (6.6)	22.0	36.0	74.0	33 (8.6)
Miscellaneous food and beverage categories								
Black teas	176.5	221.8	268.0	94 (16.8)	164.0	200.7	250.0	73 (19.1)
Fruit drinks and juices (not 100%)	180.0	200.0	247.3	159 (28.3)	152.0	200.0	212.5	87 (22.8)
Table salt	1.0	1.0	3.0	32 (5.7)	1.0	1.0	4.0	10 (2.6)
Plain water	152.0	226.0	301.3	351 (62.6)	150.0	217.0	281.3	253 (66.2)
Total	190.6	244.5	312.5	561 (100)	187.0	240.1	305.8	382 (100)

Table 6: Portion sizes (grams) of each food and beverage category consumed for snacks by CCLaS participants, by gender

^a Listed food categories are restricted to those consumed by > 5% of children.

^b Gram weights for household measures sourced from USDA National Nutrient Database for Standard Reference (67))

^c Specific gravity for conversion of liquid volumes sourced from (68)

^d Sourced from Food Safety Authority of Ireland, Scientific Recommendations for Healthy Eating Guidelines in Ireland (69)).

^e Based on Tesco brand Pita breads (<https://www.tesco.ie/groceries/Product/Details/?id=254945564>).

NDNS (NI)

All 470 participants included in the NDNS (NI) sample recorded something for a snack, whether a morning, afternoon or evening snack, on at least one of their three recorded food diary days. Thus, the following analyses for evening meal consumption are based on all included participants (n=244 males, n=226 females) from NDNS (NI).

Table 7 presents the median portion sizes (Q_2) consumed in grams, with associated interquartile ranges ($Q_1 - Q_3$), for each food and beverage category consumed for snacks by NDNS (NI) participants. Number and proportion of participants reporting having consumed foods or beverages from each category are also reported.

Table 7: Portion sizes (grams) of each food and beverage category consumed for snacks by *NDNS (NI)* participants, by gender

Food category ^a	Males (NDNS (NI))				Females (NDNS (NI))			
	<i>n=244</i>				<i>n=226</i>			
	Q ₁	Q ₂	Q ₃	n (%)	Q ₁	Q ₂	Q ₃	n (%)
Fruit and vegetables								
Apples and pears not canned	67.0	100.0	100.0	99 (40.6)	67.0	100.0	100.0	100 (44.2)
Other fruit not canned	28.0	46.5	90.0	81 (33.2)	28.0	46.7	78.7	80 (35.4)
Bananas	67.0	100.0	100.0	83 (34)	83.5	100.0	100.0	74 (32.7)
Fruit juice (unsweetened)	137.5	200.0	275.0	65 (26.6)	150.0	192.1	212.5	59 (26.1)
Other vegetables (including homemade dishes)	20.0	53.6	69.5	37 (15.2)	20.3	37.4	60.0	44 (19.5)
Carrots not raw	26.2	40.0	54.7	35 (14.3)	22.3	40.0	60.0	38 (16.8)
Salad and other raw vegetables	2.6	22.5	48.0	22 (9)	8.0	17.1	56.0	37 (16.4)
Citrus fruit not canned	70.0	83.5	125.0	34 (13.9)	69.3	87.0	116.0	33 (14.6)
Peas not raw	20.0	30.0	40.0	17 (7)	22.2	30.0	33.8	15 (6.6)
Leafy green vegetables not raw	40.0	51.3	75.0	14 (5.7)	60.0	85.0	96.0	13 (5.8)
Tomatoes raw	34.0	42.5	58.0	12 (4.9)	34.0	42.5	63.7	9 (4)
Potatoes, bread, rice, pasta and other starchy carbohydrates								
White bread (not high fibre, not multiseed bread)	36.0	54.0	72.0	146 (59.8)	33.1	46.4	63.0	147 (65)
Other breakfast cereals (not high fibre)	20.0	30.0	42.0	85 (34.8)	20.0	29.4	42.0	76 (33.6)
High fibre breakfast cereals	27.0	40.0	47.3	71 (29.1)	20.0	30.0	40.9	51 (22.6)
Other potatoes (including homemade dishes)	93.0	120.0	160.0	47 (19.3)	71.3	102.6	150.7	48 (21.2)
Brown, granary and wheat germ bread	33.4	57.2	66.8	44 (18)	33.8	62.0	72.0	37 (16.4)
Wholemeal bread	29.3	44.2	62.0	24 (9.8)	31.0	33.8	62.0	28 (12.4)
Other cereals	16.0	42.4	220.2	22 (9)	7.9	14.3	48.1	20 (8.8)
Pasta (manufactured products and ready meals)	150.0	205.0	301.7	15 (6.1)	122.5	200.0	225.0	15 (6.6)
Rice (other, including homemade dishes)	64.0	80.0	150.0	11 (4.5)	86.9	120.0	157.5	15 (6.6)
Pasta (other, including homemade dishes)	165.6	222.0	247.0	13 (5.3)	129.5	165.6	230.0	13 (5.8)
Dairy and alternatives								

Semi-skimmed milk	117.0	158.0	228.6	139 (57)	84.6	125.2	166.0	132 (58.4)
Whole milk	100.0	150.0	207.5	78 (32)	100.0	136.0	188.6	65 (28.8)
Yogurt	100.0	125.0	150.0	73 (29.9)	100.0	125.0	150.0	46 (20.4)
Other cheese	20.0	21.2	32.7	47 (19.3)	20.6	29.0	36.3	46 (20.4)
Cheddar cheese	20.0	27.6	36.3	18 (7.4)	9.1	12.4	45.0	22 (9.7)
Other milk	150.0	225.0	350.0	14 (5.7)	250.0	260.0	336.0	11 (4.9)
Beans, pulses, fish, eggs, meat and other proteins								
Other bacon and ham (including homemade dishes)	23.0	35.5	52.3	77 (31.6)	23.0	27.7	50.0	73 (32.3)
Other sausages (including homemade dishes)	60.0	120.0	120.0	46 (18.9)	50.0	60.0	120.0	43 (19)
Other chicken/turkey (including homemade recipe dishes)	42.9	82.2	100.0	41 (16.8)	49.8	75.0	121.7	41 (18.1)
Other eggs and egg dishes including homemade	57.0	62.0	114.0	35 (14.3)	57.0	60.0	64.7	37 (16.4)
Manufactured coated chicken/turkey products	56.0	101.0	128.0	30 (12.3)	52.5	69.6	100.0	32 (14.2)
Other beef & veal (including homemade recipe dishes)	55.8	78.9	138.4	28 (11.5)	37.0	64.0	96.5	25 (11.1)
Burgers and kebabs purchased	45.0	78.0	118.5	8 (3.3)	75.0	97.5	188.5	16 (7.1)
Baked beans	72.9	90.0	166.0	23 (9.4)	45.0	93.6	135.0	14 (6.2)
Nuts and seeds	10.0	15.0	25.0	11 (4.5)	11.9	12.0	15.0	10 (4.4)
Oil and spreads								
Reduced fat spread (not polyunsaturated)	7.0	10.0	15.0	62 (25.4)	5.1	9.0	13.8	72 (31.9)
Butter	8.8	12.0	17.0	57 (23.4)	7.0	10.0	18.0	51 (22.6)
Polyunsaturated low fat spread	7.0	10.0	11.7	25 (10.2)	6.5	9.5	14.0	40 (17.7)
Reduced fat spread (polyunsaturated)	6.2	9.3	15.0	19 (7.8)	7.0	10.0	13.0	24 (10.6)
Other cooking fats and oils not polyunsaturated	1.3	3.3	5.5	14 (5.7)	1.4	3.9	9.8	16 (7.1)
Polyunsaturated oils	2.0	5.9	11.0	6 (2.5)	0.8	2.0	3.0	14 (6.2)
Low fat spread not polyunsaturated	7.0	10.0	18.0	7 (2.9)	8.0	10.0	24.0	11 (4.9)
Eat less often and in small amounts								
Crisps and savoury snacks	20.1	25.0	30.0	130 (53.3)	21.1	25.0	30.0	127 (56.2)
Chocolate confectionery	20.0	28.5	42.0	111 (45.5)	20.0	26.0	36.5	122 (54)
Buns cakes and pastries (manufactured)	36.5	55.8	65.0	80 (32.8)	31.5	43.0	63.0	95 (42)
Sugar confectionery	15.9	35.8	50.8	76 (31.1)	10.0	30.0	58.0	81 (35.8)

Soft drinks not low calorie carbonated	250.0	330.0	476.8	85 (34.8)	175.0	300.0	400.0	59 (26.1)
Soft drinks not low calorie, ready to drink, still	200.0	208.0	300.0	65 (26.6)	200.0	219.0	252.0	54 (23.9)
Ice cream	52.5	65.8	102.0	50 (20.5)	50.0	65.0	90.0	51 (22.6)
Sugar	5.0	10.0	10.5	64 (26.2)	5.0	6.2	10.0	45 (19.9)
Preserves	10.6	13.9	20.5	28 (11.5)	8.0	9.3	16.0	27 (11.9)
Soft drinks not low calorie concentrated	187.5	233.3	300.0	35 (14.3)	150.0	200.0	297.0	26 (11.5)
Buns cakes and pastries (homemade)	36.0	48.0	62.0	14 (5.7)	28.0	38.0	57.2	14 (6.2)
Sweet spreads fillings and icing	12.0	24.0	24.0	11 (4.5)	15.0	24.0	30.0	11 (4.9)
Composite								
Biscuits (manufactured/retail)	16.7	24.0	31.0	154 (63.1)	18.0	24.4	32.0	135 (59.7)
Savoury sauces pickles gravies & condiments	10.0	30.0	60.3	90 (36.9)	7.5	24.8	50.0	99 (43.8)
Chips purchased including takeaway	70.0	100.0	132.0	34 (13.9)	78.0	100.0	120.0	50 (22.1)
Fromage frais and other dairy desserts (manufactured)	50.0	60.0	84.3	36 (14.8)	50.0	60.0	84.0	33 (14.6)
Other fried/roast potatoes (including homemade dishes)	100.0	151.3	200.0	30 (12.3)	79.1	100.0	120.0	29 (12.8)
Soup (manufactured/retail)	200.0	202.5	215.0	13 (5.3)	150.0	202.5	300.0	22 (9.7)
Meat pies and pastries (manufactured)	56.0	101.8	145.0	18 (7.4)	32.0	67.0	145.0	18 (8)
Other manufactured potato products fried/baked	45.0	100.0	130.0	19 (7.8)	45.0	60.0	120.0	17 (7.5)
Cereal based milk puddings (manufactured)	140.0	150.0	150.0	20 (8.2)	97.0	129.6	150.0	10 (4.4)
Pizza	121.0	287.0	380.0	20 (8.2)	116.0	145.0	172.5	9 (4)
Miscellaneous								
Soft drinks low calorie concentrated	150.0	200.0	287.4	93 (38.1)	148.5	198.8	258.3	68 (30.1)
Tea (made up)	160.0	200.0	223.8	59 (24.2)	138.0	175.0	220.0	63 (27.9)
Bottled water still or carbonated	225.0	330.0	500.0	39 (16)	216.7	300.0	500.0	55 (24.3)
Soft drinks low calorie carbonated	150.0	250.0	366.7	31 (12.7)	200.0	243.3	300.0	33 (14.6)
Soft drinks low calorie, ready to drink, still	157.5	203.0	250.0	24 (9.8)	200.0	200.0	228.0	28 (12.4)
Beverages dry weight	12.0	16.5	22.8	12 (4.9)	15.0	18.0	18.0	19 (8.4)
Tap water only	133.3	200.0	300.0	121 (49.6)	122.5	190.8	250.0	134 (59.3)
Total	223.4	287.7	365.4	244 (100)	187.6	255.1	340.2	226 (100)

^aListed food categories are restricted to those consumed by > 5% of children.

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