What's on offer?

The nutritional quality of food available in children's social and activity centres

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Foreword

In November 2018, safefood commissioned a research project to understand the nature of food provision in children's social spaces on the island of Ireland.

The aim of this research was to collect data on the types of food and drink available in places where children play and exercise and to gain an understanding of the barriers to and facilitators for making healthy food available in these locations.

This report presents research findings and recommends ways to support centre managers, members of catering staff and parents make enable healthier food and drink choices in children's social spaces.

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Table of contents

Glossary vii

Executive Summary ix

1 Introduction 1

2 Objectives 2

3 Literature review 3

What does the 'food environment' mean? 4

Literature review methodology 10

Literature Review Search Results 12

The food environment at sports clubs, leisure centres and play centres relevant to children 13

Parent's and children's eating and food choice practice in children's social spaces 22

Facilitators of and barriers to healthy eating at sports clubs, leisure centres and play centres relevant to children 26

Market reports, policies and regulations 31

Policies relevant to children's social spaces 34

Conclusion 35

4 Methods 37

Background 37

Description of food available in children's social spaces 37

Case studies with centre managers, parents and members of catering staff within children's social and activity centres 48

Focus group discussions with parents whose children visit children's social and activity centres regularly 50

5 Results 52

Audit of food and beverage provision in children's social and activity centres 52

Food environment information 57

Case study interviews with key stakeholders within children's social and activity centres 60

Focus groups discussions with parents of children attending children's social and activity centres regularly 63

6 Discussion and key findings 67

Food and beverages available within children's social spaces 67

Parents' and children's eating and food choice practice within children's social spaces 68

Barriers to and facilitators of healthy eating within children's social spaces 68

7 Conclusions 70

8 Recommendations 72

9 References 74

Appendices 83

Appendix II: Audit instruction manual 88

Appendix III: Audit tool 100

Appendix IV: Audit tool scoring system 115

Appendix V: Case study interviews topic guide 139

Appendix VI: Focus group discussions topic guide 145

Appendix VI: Focus group vignettes 147

List of tables

Table 1: Search terms used to retrieve academic literature on the food environment and food choice in settings in which children socialise 10

Table 2: Description of the food categories defined in the Healthy Eating in Recreation and Sport Settings (HERSS) voluntary guidelines 18

Table 3: Literature assessing the food environment in settings in which children socialise 20

Table 4: Literature available describing food choice in settings in which children socialise 25

Table 5: Literature available on facilitators of and barriers to healthy eating in settings in which children socialise 29

Table 6: Government policy and guideline documents for healthy food environments in settings in which children socialise 32

Table 7: Categories of centres providing social spaces for children on the island of Ireland 39

Table 8: Deprivation categories outlines in An Pobal's Deprivation Index by Small Area 2016 40

Table 9: Deprivation categories outlined in the Northern Ireland Multiple Deprivation Measure 2017 41

Table 10: The number of centres offering social spaces for children contacted on the island of Ireland and the number of refusals 42

Table 11: Sample characteristics of social space centres audited on the island of Ireland 52

Table 12: Beverages available to purchase at shops and cafés in a sample of social and activity centres for children on the island of Ireland 53

Table 13: Snacks available to purchase at shops and cafés in a sample of social spaces for children on the island of Ireland 54

Table 14: Meals available to purchase in venue canteens and restaurants in a sample of social and activity centres for children on the island of Ireland 55

Table 15: Beverages available for purchase from vending machines in a sample of social and activity centres for children on the island of Ireland 56

Table 16: Snacks available for purchase in vending machines in a sample of social and activity centres for children on the island of Ireland 56

Table 17: Children's meals available for purchase in in a sample of social and activity centres for children on the island of Ireland 57

Table 18: Promotional activities in a sample of social and activity centres for children on the island of Ireland 58

Table 19: Nutritional policies and catering practices in a sample of social and activity centres for children on the island of Ireland 59

Table 20: Differences in Total and Relative 'Healthfulness Scores' across different centre characteristics 60

Table 21: Relevant audit tools that informed the development of an appropriate instrument to measure children's social spaces 86

List of figures

Figure 1: Model of Community Nutrition Environments 6

Figure 2: An ecological framework indicating influences on food consumption 7

Figure 3: Factors affecting children's out-of-home food choice decisions 8

Figure 4: Selection and exclusion process of academic literature on the food environment and food choice in settings in which children socialise 13

Glossary

ANGCY	Alberta Nutrition Guidelines for Children and Youth
ANGELO	Analysis Grid for Environments Linked to Obesity
BTG-FSOF	Bridging the Gap – Food Store Observation Form
CSO	Central Statistics Office
FEAD-N	Food Environment Audit for Diverse Neighborhoods
FSA	Food Standards Agency
HERSS	Healthy Eating in Recreation and Sports Settings
HFSS	High in fat, sugar and salt
HSE	Health Service Executive
IOI	The island of Ireland
MRFEAT	Municipal Recreation Facilities Food Environment Audit Tool
NEMS– R	Nutrition Environment Measures Survey – Restaurant
NEMS–S	Nutrition Environment Measures Survey – Store
NI	Northern Ireland
NIMDM	Northern Ireland Multiple Deprivation Measure
NINIS	Northern Ireland Neighbourhood Information Service
NPM	Nutrient Profiling Model
NYC	New York City
Obesogenic	Tending to cause obesity, or overweight. ("Leptogenic" means tending to cause weight loss, or underweight.)
Qualitative research method	A way of collecting subjective, not directly measurable data to study; for example, analysing the case studies to understand activity centre managers' views of consumer demands.
Quantitative research method	A way of collecting directly measurable (quantifiable) data to study; for example, the audit tool developed to measure the healthfulness of foods offered in children's social spaces uses "yes/no" tick boxes to take account of the foods and beverages available.
QUB	Queen's University Belfast
RF	Recreational facility

ROI	The Republic of Ireland
RSS	Recreation and sport setting
SAP	Small Area Population
SNACZ	Students Now Advocating to Create Healthy Snacking Zones
SPSS®	Statistical Package for Social Sciences
SSB	Sugar-sweetened beverage
UCD	University College Dublin
UK	The United Kingdom
US	The United States
WHO	World Health Organization

Executive Summary

The food environment in which children spend their time has a major influence on their dietary intake and food eaten out of the home is consistently high in sugar, fat and/ or salt. Research has found that children are more likely to eat foods high sugar, fat and/ or salt in sport and leisure activity settings.

What do we know from the literature?

An international literature review was conducted and found the food and beverages on offer in spaces where children socialise, including leisure centres and sports centres, were not conducive to a healthy diet. Studies reported that although parents were dissatisfied with the food on offer in these settings, they often resorted to buying 'unhealthy' options for their children due to time-constraints, cost and often to avoid arguments with their children. Interviews with recreation and leisure centre operators found that the main barriers to implementing healthy eating guidelines in their facilities was their perception that customers preferred 'unhealthy' options and they were worried an increase in healthier alternatives would damage sales. Previous studies indicate that site-specific guidelines can improve the nutritional environment, however guidelines are most effective when their implementation is mandatory rather than voluntary.

No previous research has been conducted on the healthfulness of the food environment in children's social spaces on the island of Ireland, and no policies or guidelines are available in the UK or Ireland that are specific to these settings.

Objectives

- This study was undertaken to evaluate the food environments in children's social spaces on the island of Ireland, and to establish the attitudes to and perceptions of these environments among key stakeholders – parents of children that regularly attend relevant centres centre managers and catering staff.

Methods

- Children's social spaces were defined as places where children play and exercise indoors such as leisure centres, indoor soft play centres, swimming pools.
- A total of 65 centres was audited across the island of Ireland to determine the availability and nutritional quality of food and beverages in children's social spaces. Each centre was given a 'Relative Healthfulness Score' i.e. the total number of healthy products available as a percentage of total products available within a centre
- A series of six case study interviews were undertaken with centre managers, members of catering staff and parents of children who attend centres regularly across the island of Ireland.
- Four focus groups were held with parents to determine the perceptions of foods available and to explore suggestions on how food choice in these centres can be navigated.

Key findings from audit

- The types of centres included in the study included community play centres, commercial play centres and public sports centres.
- Diet soft drinks, sugar-sweetened soft drinks, and plain (unflavoured) water were available in over 80% of the centres.
- Chocolate bars were the most commonly available snack item found in 82% of centres, followed by crisps (73%), and baked goods such as croissants, muffins, cupcakes (58%).
- Fruit or vegetable slices or pieces were available in 55% of centres.
- In the centres that provided meals, sandwiches/ wraps were the most commonly available meal item (71%), followed by cheese toasties (63%) and chicken nuggets and chips (both available in 60% of centres).
- Only 30% of centres had soup or vegetables available as a meal option.
- Water is freely available at all times in almost three-quarters (72%) of centres.
- Brown bread, which is higher in fibre than white varieties, was available in 53% of centres (n=46)
- Only 3% centres providing meals (n=38) added salt to chips
- Only 30% centres permit customers to bring their own food into the centres
- Vending machines were found in 55% of centres and unflavoured water was found in 89% of machines, followed by sugar-sweetened soft drinks (86%) and diet soft drinks (80%). Chocolate bars were the most common food items found in vending machines (71%), followed by crisps (69%). Less than 20% of the machines provided a healthier alternative snack.
- The relative healthfulness score indicated no significant difference across type of centres, deprivations index, rural or urban location or whether they were privately or publicly owned. The median ranges were 46%, 48% and 67% for children's play centres, sports centres and community centres, respectively.

Key findings from case study interviews and focus groups

- Managers and staff described their desire to provide healthy options but identified challenges such as competition with other food businesses, perceived demand by customers for unhealthier options and healthy food promotion not being part of their job role.
- Parents were generally disappointed in the "*greasy*", poor quality and over-priced food choices available. They found that adult or super-sized packet items were available rather than standard or child packets.
- Parents believed that healthier cooking methods, such as baked rather than deep fried options, could be more readily available.
- Parents wanted better marketing of healthy options, such as reward cards, meal deals or free toys. They also suggested smaller portions of adult meals, making the healthier option more prominent and using brightly coloured advertising as ways to encourage healthier food choices.

Conclusions

Review of the evidence

- There is limited evidence internationally on the food available in children's social spaces; however, the data available found that food offerings were generally unhealthy, and the majority was high in fat and/or salt.
- There are a small number of examples of good practice and resources from other countries such as the Australian 'Fuel to Go & Play' https://www.fueltogo.com.au/ that could inform practice on the island of Ireland

Audit of centres

- The findings from the current study indicate the nutritional quality of foods offered in children's social spaces on the island of Ireland varies considerably but less healthy options predominate.
- Vending machines had the lowest nutritional quality of foods on offer and the implementation of 'healthy' vending machines or guidelines for snacks and beverages in vending machines in children's social spaces could make an important contribution to improving the provision of healthful options.
- Overall, this makes it very challenging to promote healthier options to children in the current food environment in these centres when the 'norm' in the centres is the unhealthier choice
- The use of the relative 'Healthfulness Score' can give insight into the relative healthfulness of foods and beverages available in children's social spaces.

Catering and management perspective

- The majority of businesses did not recognise the importance of the link between being physically active and healthy eating. A small number of businesses indicated an awareness of the unique influence centres such as these have on children's nutrition and had taken steps to implement policies to create more healthful environments.
- Centre managers and catering staff described how consumers have moved towards healthier choices but how they as businesses were more focused on operational activities and physical health than food choice. Both groups reported difficulties in maintained fresh food and identified competition from external business as barriers to healthier food provision; but seen small and easy-to-implement changes, such as oven rather than fried goods, as achievable and desired to improve the healthiness of their offerings when possible and practical.

Parents' views

- Parents reported that compromising and complying with social norms, were important considerations when making food choices.
- Parents reported a general disappointment in healthy food availability in centres and how this often encouraged them to purchase food outside the centre. Parents identified multiple

influences that encouraged unhealthy eating e.g. only adult sized portions of bars/snack food, 'deep -fried' food being the most common option available, freebies and advertising, and cost.

- Parents suggested more inventive meal deals, such as picnic baskets, and improved placement of healthier food, to empower healthier choices by children.

Recommendations

Food providers have a corporate social responsibility to provide an environment that supports and promotes healthy options for children. These centres are providing an environment where children can be physical active and it's important that this is further supported by healthy food and drink options.

Top ten tips for healthier service provision in social spaces for children

1. Do not display chocolate bars, crisps, sweets, cereal bars at payment/cash desk areas as this increases impulse purchases
2. One hundred per cent of beverages must be sugar free, diet or have no added sugar and tap water should be freely available and low fat and skimmed milk must on offer every day
3. Offer half portions of adult size meals for children
4. Fruit, vegetables or salad should be available at all times
5. Meal deals must include a piece of fruit or a portion of salad
6. Tasty labels – promote healthier options such as 'meal of the day' at the servery or counter
7. Do not display salt, salt substitutes and sugar sachets/cubes
8. Do not provide chips or crisps as an accompaniment to sandwiches
9. At least 50 per cent of all main course options must not be deep fried, batter coated or bread crumb-coated, or include a creamy sauce or pastry
10. All mayonnaise, salad dressings and salad creams (including those used in potato salads and coleslaws) must be low fat, light or reduced calorie versions.

- Publicly funded centres in NI should be made aware of the Nutritional Standards for Health and Social Care, the Nutritional Standards for District Councils and the plans to implement in the future Nutritional Standards for the Public Sector. These standards cover food and drink in catering and retail outlets and vending
- In ROI, guidance and resources to support in publicly funded venues including centres used by children and their families that offer food and drink should be considered. Guidance could be adapted from the existing nutrition standards for food and beverage provision for staff and visitors in healthcare settings (https://www.hse.ie/eng/about/who/healthwellbeing/our-priority-programmes/heal/healthy-eating-guidelines/nutrition-standards-for-food-and-beverage-provision-for-staff-and-visitors-in-healthcare-settings.pdf) and from the HSE vending policy (https://www.hse.ie/eng/about/who/healthwellbeing/our-priority-programmes/heal/healthier-vending/)
- Standards and guidance in NI and ROI should be promoted to privately owned centres
- Promote the use of the audit tool and scoring system to assess the types of foods and drinks available in centres both for self-auditing by centres and for use by other stakeholders

- Consider a stepwise approach to making changes e.g. the removal of sugar sweetened beverages from centres. This will help centres to build up confidence in making changes
- The implementation of standards or guidance should coincide with the development and dissemination of support materials and resources specifically for centre managers and staff. An example internationally is the Australian 'Fuel to Go & Play' (https://www.fueltogo.com.au/). Such an approach may include
    1. An information pack for managers and staff to illustrate the importance of healthy offerings for children in these spaces. It should emphasize the importance of consistent health messages – physical activity and healthy eating go hand in hand. It may contain ideas of how to offer healthier food choices including food swaps, different portion sizes, healthier menu ideas and a template of a healthy eating policy that centres can adapt to implement in their centre
    2. Posters, table cards or hanging cards which centres can use to promote healthier options
    3. Examples of how food and drink can be placed to display or position healthy food options to make them more prominent and appealing including incentives that could encourage families to choose the healthier option e.g. reward cards
    4. An online training programme for centre managers and staff which could be supported by facilitating a network of centre managers to share learning and experience
    5. All supports and materials would need to be piloted and evaluated to demonstrate effectiveness.

Parents should be supported to choose and advocate for healthier options. Examples include

1. Choose centres where there are healthier food and drink options. Ask for freely available water
2. Ask for healthier options at centres they regularly attend (centre managers and staff clearly reported that they will respond to customer demand)
3. Talk to other parents about the challenge – the more parents who ask centres for change the more likely it will be that centres will change. Parents need to be supported to recognise their power to bring about change together
4. Talk to your child about what foods and drinks to choose
5. Raising awareness of this issue among parents, by organisations such as ***safe***food, to support parents' conversations with their peers, their children and with centres
6. Messaging for parents should be co-created with parents.

1 Introduction

Childhood obesity continues to be one of the biggest challenges for governments and societies to address. Overweight and obesity are largely preventable, but children and their families find it challenging to make healthier choices when frequently only the unhealthy option is available. Since the 1970s there has been an increase in people eating food that has not been prepared at home (1). Recent data from the Republic of Ireland found children obtained 13% of their energy from food consumed outside the home (2). The type of food eaten outside of the home is typically higher in fat and sugar and can contribute to increasing weight (3, 4). When food is available for people to buy or to eat outside of their home, it is often referred to as the 'food environment'. The food environment is one of the established determinants of children's diet and nutritional status and has been proposed to play a role in the development of childhood obesity at a population level (5). A small number of studies have been conducted in Australia, Canada, the United Kingdom and the United States studying the nutritional quality of food available for children in places where they exercise, play and socialise. Findings indicate that healthy food choices for children are limited in these venues.

2 Objectives

The aim of this project was to understand the nature of food provision in children's social spaces on the island of Ireland. The project employed both quantitative and qualitative research methods to understand the food environment within these children's social and activity centres.

Review the research on food provision in children's social spaces: The first objective was to provide an overview of the current evidence of food provided in recreational spaces designed for children and the experiences of parents attending these spaces. To achieve this objective a literature review was conducted on the available research to date on children's recreational of social spaces. The literature search included the study of the food environment within children's social spaces, parent and child food choice practices at these venues, facilitators and barriers to healthy eating within these locations and food business operations commonly used within these centres. Additionally, the evidence on the regulatory environment and marketing principles employed in centres which may influence the availability or unavailability of certain foods and beverages in these locations was reviewed.

Describe the food available in children's social spaces: The second objective was to describe the range and nutritional quality of the food on offer in recreational centres to understand the availability of healthy and less healthy options for children and their parents. In addition, the relative portion sizes for children and the presentation of the food environment were also captured. Data was collected through an audit of 65 centres across the island of Ireland. A range of centres were included, in terms of urban or rural location, deprivation index score, centre size and type of centre. The literature review informed the audit protocol and design. There did not appear to be an audit tool available that would address the specific objectives of the study, so the available evidence on existing audit tools was utilised to inform the development of a bespoke audit tool to measure these centres.

Understand the barriers and facilitators: A third objective was to understand of the barriers to and facilitators of food purchasing decisions and the provision of healthy food in recreational centres. A further objective was to identify methods to support stakeholders in healthy food provision and healthy food choices within these locations. Key stakeholders identified were centre managers, members of catering staff and parents of children who regularly attend children's social spaces. A total of 5 centres were involved in case study interviews and 3 participants were interviewed within each centre, providing a total of 15 interviews.

Understand parents' experiences: The fourth objective provided an understanding of parents' experiences, while navigating the food environment within children's social spaces. Focus group discussions were held across the island of Ireland, in urban and sub-urban locations, taking consideration of deprivation index. In addition, strategies to support parents in making healthier choices in these spaces were also identified.

3 Literature review

It is well established that higher dietary intakes of energy, and declines in physical activity influence the development of overweight and obesity in childhood (6). Although physical activity in childhood is recommended for maintaining a healthy weight (6), two research studies have indicated that children who are involved in sports are more likely to consume greater amounts of sugar-sweetened beverages (SSBs), "fast food" and energy compared to children who are less active (7, 8).

Food environments in which people spend their time, such as schools, sport centres and the home, have been highlighted as major influences on food choices associated with the increased incidence of obesity in Western societies (9). As a result, various health agencies, such as the World Health Organisation (WHO), and the Institute of Medicine and the Centers for Disease Control and Prevention in the US, have identified interventions within food environments as an approach that can positively contribute to a decrease in obesity at a population level (10, 11).

Eating outside of the home is often associated with higher caloric intake in children, and venues commonly used by children for socialising or exercising are thought to contribute to higher energy intake (12-14). A study that explored the eating environments of children and adolescents in the UK, using data from the UK *National Diet and Nutrition Survey Rolling Programme (NDNS) (2008–2014)*, found that children aged between 4 and 18 years consumed the highest proportion of food items not "considered important or acceptable within a healthy diet" in leisure settings (15). Leisure settings included sport clubs and leisure activity venues.

The National Children's Food Survey in Ireland (2003–2004) reported that, although food consumed out of home accounted for only 9% of children's energy intake, the food eaten was proportionally higher in fat and lower in fibre than food consumed at home (16). The recent report on the second *National Children's Food Survey (2017-2018)* identified an increase in out-of-home eating to 13%, indicating an upward trend (17).

Leisure settings on the island of Ireland provide an opportunity for food consumption outside the home. The food provided in these settings is typically subcontracted to external companies , and on the island of Ireland these food businesses are required to adhere to relevant regulations related to food safety , but not healthy eating (18, 19). The focus of food services in sports facilities is to establish market demand for food offered and to provide revenue for the sports facility, as opposed to encouraging healthy eating (20). Although many of the spaces where children socialise promote physical activity, i.e. sports centres, healthy eating does not appear to be promoted to the same extent.

What does the 'food environment' mean?

A comprehensive definition of food environments is necessary to accurately interpret their influence on food behaviour and while many authors have attempted to provide one, consensus has not been reached (21). Food environments are varied and complex with many 'dimensions and levels of influence' (21). As a result, experts in the field have pointed towards the use of conceptual models to define all aspects of the food environment that may influence eating behaviour.

In 1977, Bronfenbrenner introduced the concept of four levels of influence on human behaviour: microsystem, mesosystem, exosystem and macrosystem (22, 23). This concept enabled human behaviour to be explored in the context of varying environments in which people live. The macrosystem describes the influence policies, values and cultural norms have on human behaviour through the construction of the wider societal environment in which people exist (24). In the context of food environments, the macrosystem can support or inhibit the implementation of health-promoting initiatives – for example, healthy eating guidelines and policies.

Several models have built on Bronfenbrenner's concept in attempts to better reflect modern food environments. 'Obesogenic' environments were first defined by Swinburn and colleagues in 1999 as 'the sum of influences that the surroundings, opportunities and conditions of life have on promoting obesity in individuals or populations' (21, 25). The Analysis Grid for Environments Linked to Obesity (ANGELO) framework is an ecological model (Figure 1) that Swinburn and colleagues developed to take account of the obesogenicity (the tendency to cause obesity or overweight) of different environments and identify key obesogenic influences within them (25). The strength of this model is that it is specifically designed to understand obesogenic environments on a large scale and to identify methods of enhancing these environments.

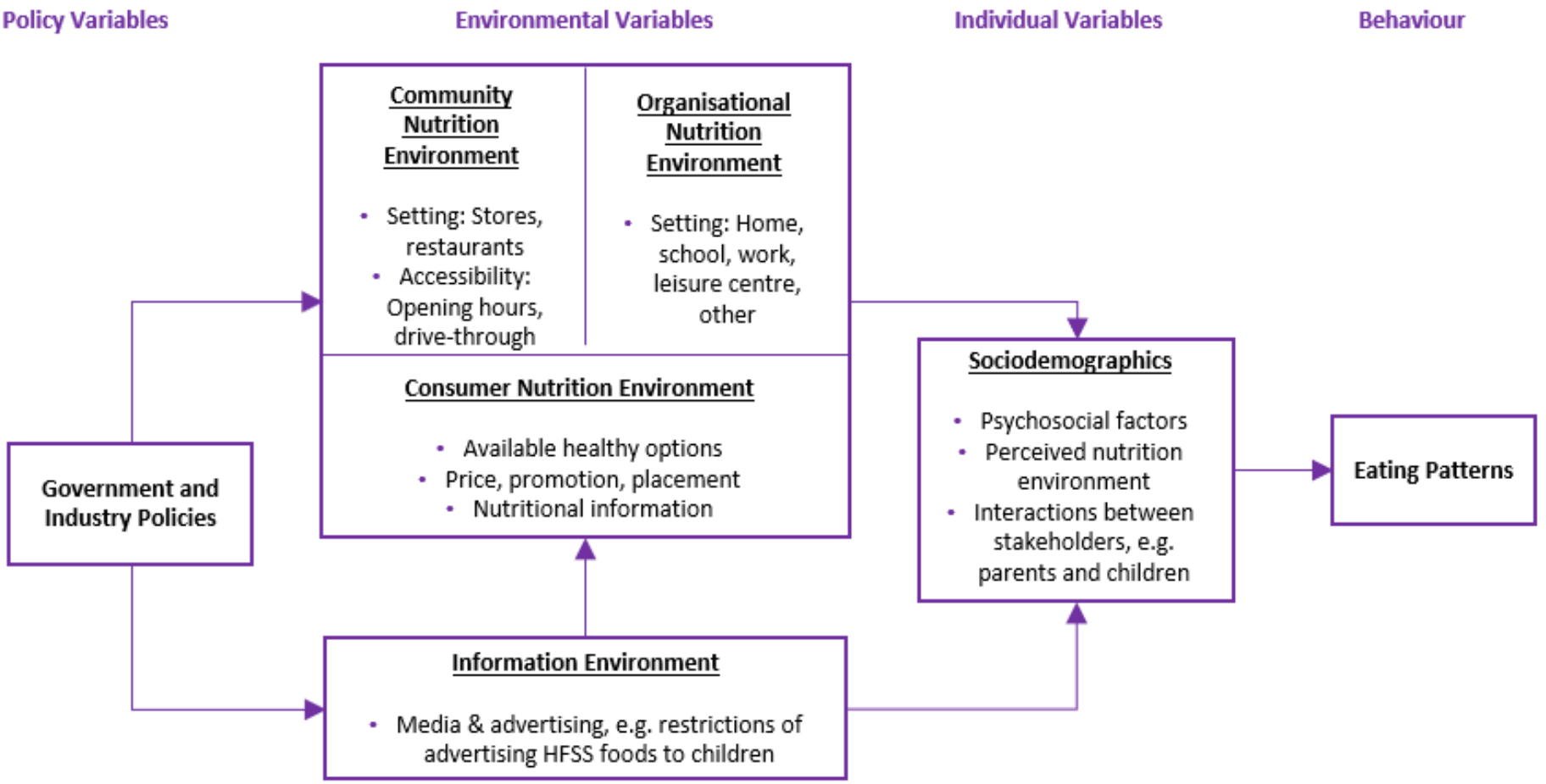
The ANGELO framework has been applied on a population level in Malta and several island communities , and also, in recreational sports centres in the UK (25-27). This model has demonstrated that it is able to assess the political, socio-cultural and physical aspects of a food environment on a large scale. The models and frameworks described have typically been applied to understand the food environments at a broader local or regional level. They are not used to describe or examine the food environment in a given site, such as a recreational or social space which will have particular characteristics that are specific to that site. For instance, in recreational spaces designed for children, while the food available might be target towards children, they do not purchase the food and so there are additional influences and steps involved in the food purchasing decisions. To apply a model to these particular environments, a framework would need to account for the interactions between stakeholders, namely parents and children within the food environment and how this affects their food-purchasing behaviour.

Glanz and colleagues (2005) further categorised food environments into community, organisational and consumer settings, and also the information environment (11). This model also highlights the effects of different policies, in addition to individual and behavioural factors within these environments. Compared to the ANGELO framework, this approach can be used on a more site-specific level as it takes into consideration influential factors specific to each category of food environment. Additionally, this

model accounts for advertising, which is particularly influential on young children (28). Although it takes settings specific to children into consideration more than the previously mentioned models, it does not specifically identify children's social spaces as a location. Therefore, this model could be broadly applicable to children's social spaces but may be missing elements that are specific to these settings.

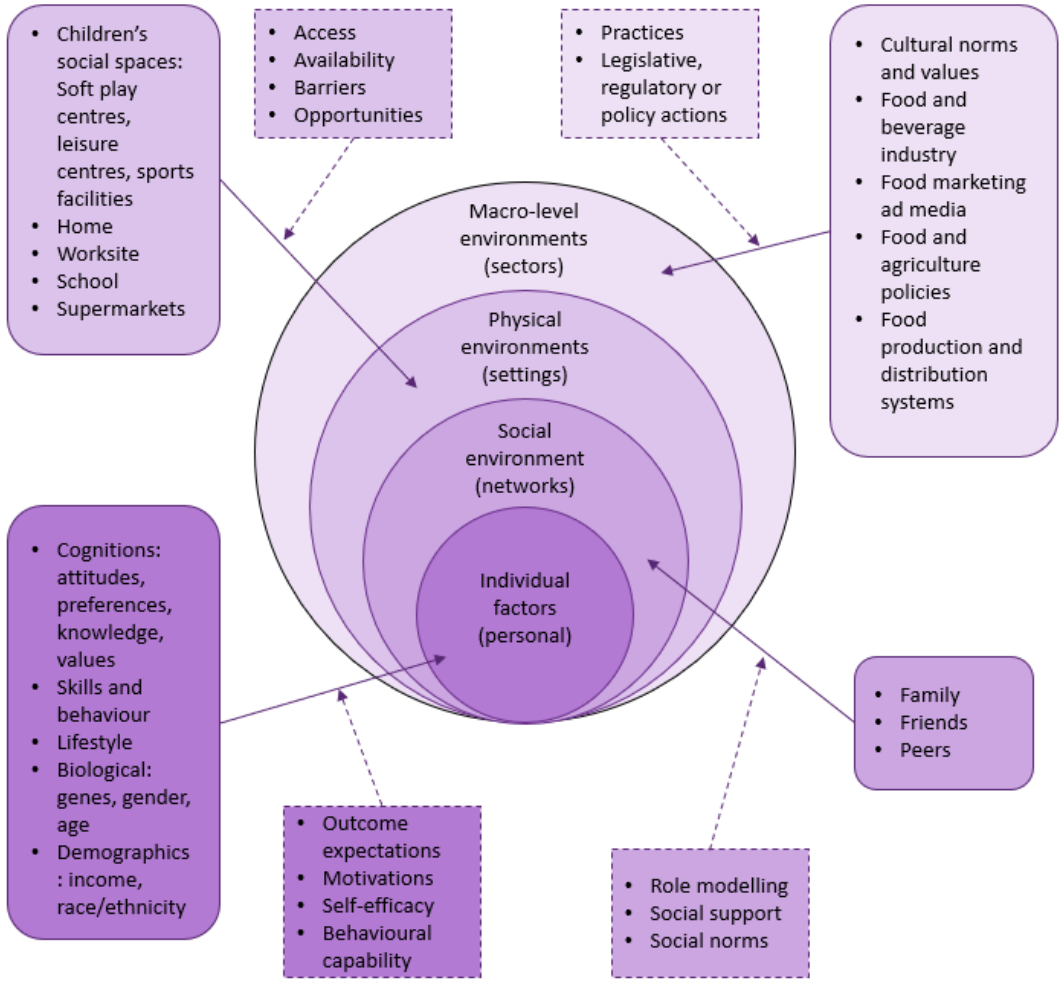
Story and colleagues further develop the original Bronfenbrenner model by using it to conceptualise adolescent eating behaviours from a socio-ecological perspective – that is, how adolescents are influenced by individual and environmental factors (29). This model identifies a greater number of basic influences that affect individuals within the food environment than previous models described – influences such as cognitions (people's processes of learning or understanding), skills and behaviours and demographics (Figure 2). It also identifies the role of family, friends and peers, all of which are important influences on food choice in food environments in which children socialise (29).

Figure 1: Model of Community Nutrition Environments



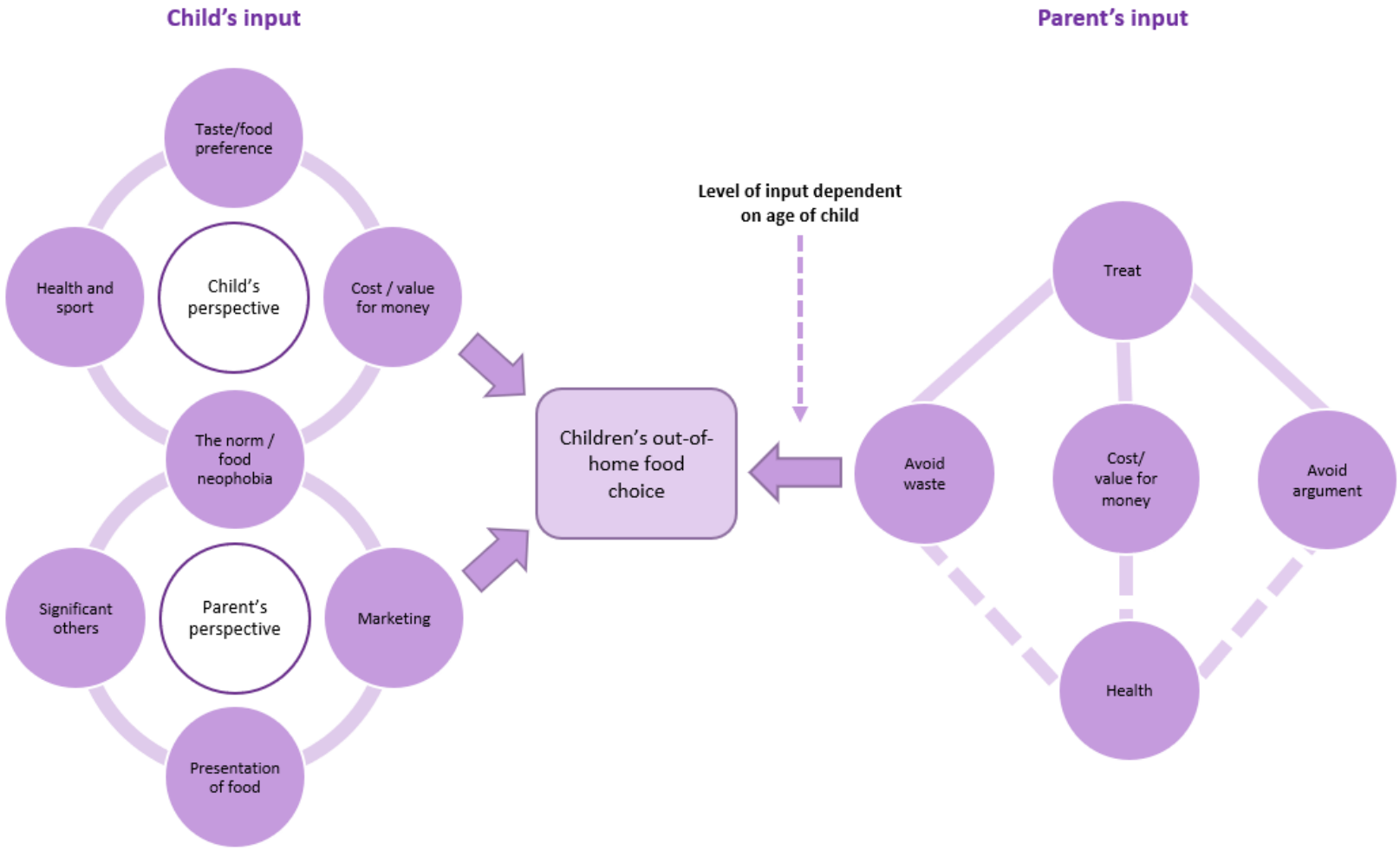
Adapted from a conceptual model of a healthy nutrition environment developed by Glanz et al. (11).

Figure 2: An ecological framework indicating influences on food consumption



Adapted from an ecological framework described by Story and colleagues (29).

Figure 3: Factors affecting children's out-of-home food choice decisions



Adapted from a conceptual model of parent and child food choice behaviour (30)

Another conceptual model identified was developed by McGuffin and colleague*s* (30). The model is based on qualitative research of families eating outside of the home in Northern Ireland (NI) and provides a comprehensive account of the parent-child interaction within eating out-of-home spaces (Figure 3). It demonstrates the inter-relationship between the child's perspective and the parent's perspective of food choice and how both influence a child's food choice out-of-home. Crucially, the model illustrates the agency (the effective power and decision-making ability) of the child within food choice, which is dependent on a child's age, but which was not considered in the description of food environments specific to children in previous models. Importantly, this model does not take into account the context of the food environment that is specific to children's social spaces such as advertising, social norms within social spaces, the 'visual' experience and the physical food environment, all of which influence children's food choice.

Limitations of models

Overall, these models highlight the interplay between the many aspects of food environments that can influence human behaviour. However, as previously described, many limitations exist within these models when studying the food environment within the unique context of children's social spaces.

Many conceptual models are not specifically designed from the perspective of children and their perceptions of the food environment have not been considered. There are also important aspects of the food environment relevant to children's social spaces not covered within the previous models in how children interact with food environments. For example, children do not always have the same autonomy in food choice as adults, particularly younger children (30). Additionally, there are many factors influencing parents within these social spaces that will, in turn, influence food choice within these venues (30, 31).

The conceptual models discussed above display the necessary distinction to be made between food environment and food choice research from adult and child perspectives. They also highlight the lack of research on food in children' social spaces. The present research will explore how this particular setting can influence food choices for children.

Measuring food environments

There are many different methods to document the food environment but efforts to enhance various environments are developing more quickly than tools to measure them accurately (21). Assessment tools used in previous studies have consisted of checklists, interviews or questionnaires, inventories and "market basket" analyses (which look for relationships between purchases and purchasing behaviours and decisions) (32), all of which vary in ease of use and reliability of the data collected. A recent review of measurement tools highlighted that although there are several instruments available, most are not validated or suitable for use outside the country in which they were designed (33).

The major challenges identified in accurately measuring the healthfulness of different settings are the application of appropriate tools to different environments and the lack of adequate reliability testing (33, 34). This research sets out to compare the assessment tools currently available for measuring the food

environment and to identify a tool, or components of tools, that would be suitable for use in food environments in children's social spaces on the island of Ireland.

Literature review methodology

A literature review was conducted to collect information on the food environment within children's social spaces and to provide background information on factors influencing food provision within these spaces. This review of the available literature was also intended to inform methodologies for the quantitative and qualitative aspects of the study.

Broadly, the literature review intended to review the research evidence on five aspects of food provision in children's social spaces:

1. The food environment at sports clubs, leisure centres and play centres used by children.
2. Parent's and children's eating and food choice practices in children's social spaces.
3. Barriers to and facilitators of healthy eating at sports clubs, leisure centres and play centres relevant to children.
4. Food business and management principles commonly used within children's social space venues.
5. The regulatory environment and marketing strategies within children's social spaces, which could affect the availability of specific foods within these venues.

Academic literature was retrieved between December 2018 and June 2019 using search terms listed in Table 1 in PubMed®, Web of Science® and PsycINFO® databases. Documents outlining food business and management principles, the regulatory environment and marketing principles were retrieved with basic internet searches using search terms such as "healthy eating policy for recreation facilities" and "food environment guidelines for leisure centres". For each section of the literature review, search terms and strategy, listed in Table 1, were developed to enable a systematic approach to the collection of literature.

The literature gathered was screened systematically using inclusion and exclusion criteria (Figure 4). Academic literature was only included if the research specifically focused on settings in which children socialise, including leisure centres, soft play centres and sports camps. Policies and regulations were included if they were directly related to children's social spaces, such as healthy eating policies for recreation facilities, and if they indirectly influenced the food consumed, such as restrictions on marketing to children.

Table 1: Search terms used to retrieve academic literature on the food environment and food choice in settings in which children socialise

Database		Search Terms	Results
1. The food environment at sports clubs, leisure centres and play centres relevant to children			
PubMed®	1	("food environment" AND (sport* OR leisure OR recreational* OR play) AND (centre OR facility* OR venue)) *[All Fields]*	46
	2	("food environment*" OR "healthy eating") AND children* AND (sport* OR leisure OR recreational* OR play) AND (centre OR facility* OR venue) NOT school *[All Fields]*	13
	3	(("food environment") AND children) AND ("play centre" OR "sports centre" OR "leisure centre" OR facility) NOT (school OR home OR hospital)	4
Web of Science®	1	TS=("food environment" AND children AND ("play centre" OR "sports centre" OR "leisure centre" OR facility OR recreational)) NOT TS=(school OR home OR hospital)	16
PsycINFO®	1	food environment children's social spaces	15
	2	food environment children's play centre NOT home OR school OR hospital OR neighbourhood	4
	3	"food environment" play centre*	3
	4	"food environment" leisure centres*	1
	5	"food environment" recreation* centre*	2

Table 1 continued

Database		Search Terms	Results
2. Parent's and children's eating and food choice practice in these venues			
PubMed®	1	"food choice") AND "sport centre") OR "recreation centre") OR "sport facility") OR "recreation facility") OR "leisure centre") OR "leisure facility") AND child *[All Fields]*	33
Web of Science®	1	TS=("food choice*" OR eating) AND TS=perspective* AND TS=(sport OR leisure OR recreation*) NOT TS=(athlete* OR patient* OR disorder)	75
	2	TS=("food choice*" OR eating) AND TS=perspective* AND TS=("out of home") AND TS=(parent OR child)	4
PsycINFO®	1	"food choice" AND child AND (sport OR recreation OR leisure) AND (facility OR venue OR centre)	6
	2	(food choice) AND perspective AND (sport centre) OR (recreation* facility*) AND child* AND parent	13
3. Facilitators of and barriers to healthy eating at those social spaces			
PubMed®	1	(facilitators* OR barriers*) AND (healthy AND (eating OR food OR environment) AND children AND (leisure OR sport* OR recreation* OR "play centre*") NOT hospital *[All Fields]*	67
Web of Science®	1	TS=(facilitators OR barriers) AND TS=(healthy food environment) AND TS=(play centre OR leisure centre OR sport centre OR recreational facility) NOT TS=hospital	15
	2	TS=(facilitators* OR barriers*) AND TS=(healthy AND (eating OR food OR environment)) AND TS=children AND TS=(leisure OR sport* OR recreation* OR "play centre*") NOT TS=hospital	46
PsycINFO®	1	(facilitators OR barriers) AND healthy AND (food OR environment) AND (leisure OR sport* OR recreation* OR "play centre") NOT (hospital OR school)	38

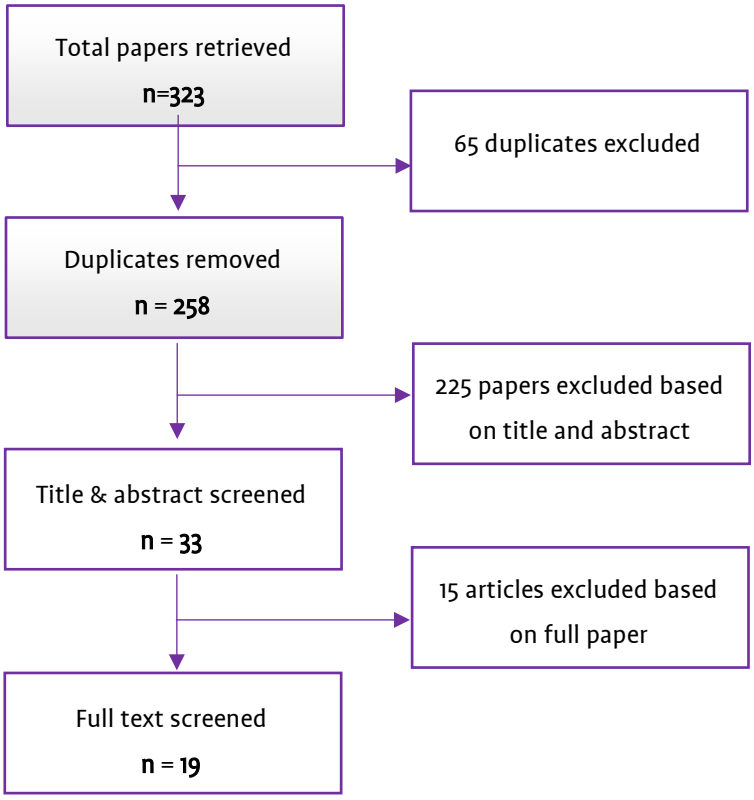
Abbreviations: AND, Boolean code to find only literature including combination of specific search terms; OR, Boolean code used in databases to find literature including one specific word or another; NOT, Boolean code used in databases to exclude desired exclusion criteria; All Fields, selection criteria used in PubMed to find literature including specific search terms in any part of paper; TS, topic of literature, code in Web of Science advanced literature search.

Literature Review Search Results

Initial searches of academic literature retrieved 323 papers. After title and abstract screening, 65 were excluded and a further 15 papers were excluded based on the full text as they were not relevant to the search criteria. The majority of the initial results focused solely on school, childcare or neighbourhood

settings and were deemed not comparable with the definition of social spaces for children used in this study. One further relevant study, identified in reference lists, was included in the review (12).

Figure 4: Selection and exclusion process of academic literature on the food environment and food choice in settings in which children socialise



There was insufficient literature on food business and management principles to be included in the main body of the literature review. In terms of the regulatory environment, 10 regulations and guidance toolkits specific to recreation facilities were identified and 18 policy, advertising and regulatory principles were identified that indirectly affect children's social spaces. These included recent sugar taxes (35, 36), restrictions on advertising and broadcasting HFSS foods to children (37) and recommendations for out-of-home food provision (38).

The food environment at sports clubs, leisure centres and play centres relevant to children

In total, 9 studies were identified that assessed the food environment of recreation, sport and leisure settings relevant to children. They were carried out in Australia (n = 1), Canada (n = 3), the UK (n = 3) and the US (n = 2). The terms 'recreation centre', 'recreation and sport setting' (RSS) and 'leisure centre' were used to describe a wide variety of venues where children play, socialise and participate in physical activity. These included bowling alleys, crèches, ice-skating facilities, parks, soft play areas, swimming pools and team sport venues.

Food and beverages were available in all settings in the form of shops, cafés, vending machines or concession stands. Concession stands were defined as "a stall where food, drinks, or other items are sold at a theatre or other venue" (39).

The studies carried out in the UK used the term 'leisure centre' which is inclusive of sports settings, lidos (outdoor swimming pools) and soft play areas (12, 14, 40). Similarly, the Australian study used the term "leisure and aquatic centre" to refer to the same type of venue (41). The Canadian studies used the term "recreation centre" or "recreation and sport setting", generally to refer to facilities where children play sports, including gymnasiums, (13, 42, 43). The 2 studies carried out in the US were in baseball pitches (44) and children's summer day camps (45), respectively. Overall, food and beverages on offer were not in line with healthy eating guidelines and included high proportions of fast food and sugar-sweetened beverages (SSB), with limited healthier options (12-14, 40-45).

In the United Kingdom, the availability of healthy options for children's meals and vending machines in leisure centres and health clubs that cater for children were found to be lacking and most products available were high in fat, sugar and salt (HFSS) (12, 14, 40). Two of the studies focused only on London so they were not representative of the whole of the UK, although their findings were mirrored by a study of leisure centres in the north of England, suggesting the standard of the food environment was likely to be unhealthy across the country. In all cases, the leisure centres included a range of facilities such as bowling alleys, ice-skating rinks and general leisure which provided exercise and sport facilities for both adults and children.

The food environment in Canadian recreational facilities also offered mostly HFSS food items and SSBs and lacked health promotion initiatives. Although most provinces in Canada have guidelines specifically for recreational facilities, we identified only 1 study that was conducted after these guidelines were implemented (43). This study reported that, in recreation and sport settings in Nova Scotia, concession stands and vending machines provided products of low nutritional value and despite the introduction of the Healthy Eating in Recreation and Sport Settings (HERSS) voluntary guidelines, the number of restricted items had increased at follow-up (43). This was reportedly due, to some extent at least, to funding issues, indicating that having guidelines in place was not enough to change the healthy offerings. Food offered in recreational, sports and cultural centres in Quebec City, Canada were also found to be nutritionally poor in a 2009 study, most commonly fast food, high sugar snacks and sugar sweetened beverages were provided (42). Similarly, in British Columbia, Naylor and colleagues observed that healthy options available in publicly funded recreation centres such as ice-skating rinks, swimming pools and leisure facilities were limited. They reported that 57% of drinks sold in vending machines were sugar sweetened beverages and 68% of snacks were chocolate bars or crisps (13).

The 2 studies conducted in the United States found similarly high proportions of high fat, salt or sugar foods on sale, although the authors of these studies focused on different environments - youth baseball arenas during games (44) and summer day camps (45). Irby and colleagues observed that 72% of the food provided to the youth baseball teams was comprised of French fries and sugary snacks, and 53% of drinks consumed were sugar sweetened beverages (44). Most food was purchased from concession

stands, in which 73% of the food options were classified as 'less healthy' as they contained high amounts of fat, sugar and/or salt. A study of the food served and consumed at summer day camps in Boston found that although the food provided by the camps for breakfast and lunch met nutritional recommendations, most children brought 'less healthy' food from home (45).

Finally, a study conducted in an aquatic and recreation centre in Australia reported a high proportion of high fat, salt or sugar foods being consumed by customers in the on-site café, particularly by children (41). Consistently, food and beverages sold in environments where children are playing and socialising disproportionately consist of high fat, salt or sugar foods and sugar sweetened beverages (12-14, 40-45). In studies that considered the wider food environment, very few facilities were found to have healthy eating policies or initiatives (13, 14, 43).

Measurement Tools

A range of observational tools have been used to assess the food environments in which children play and socialise. Five studies used measurement tools specifically developed to assess the food environment. These were mostly designed in the format of a checklist and included well-established tools such as the Nutrition Environment Measures Survey (NEMS) and Analysis Grid for Environments Linked to Obesity (ANGELO). Three studies used tools that recorded multiple aspects of the food environment - food, drinks, placement, advertising and policy (13, 14, 43).

During an on-site visit to leisure centres and health clubs in London, "General information", "Vending machine" and "Restaurant/café" forms were completed by 2 researchers where the presence of healthy eating promotional materials were recorded as an additional metric of the food environment (14). McIsaac and colleagues used an audit tool or collected data to assess food and beverages available in concession stands and vending machines in 30 recreation and sport settings in Nova Scotia pre- and one year post the introduction of Healthy Eating in Recreation and Sport Settings voluntary guidelines (43). Vending machine location, food product name and brand, method of preparation and price were also recorded, and photographs were taken of each vending machine and menu to verify contents. Naylor and colleagues developed the Municipal Recreation Facilities Food Environment Audit Tool (MRFEAT) which assessed policy, programmes, practices and food available in their facility (13). Although this was the only tool identified that considered several aspects of the food environment, it was completed by recreation facility staff and it was not evident that the results were verified by researchers.

Three studies used "mixed-methods" approaches to assess the food environment, combining observational tools to gather quantitative data on available food and beverages with semi-structured interviews to determine nutritional policies and stakeholder perceptions. In a study conducted on behalf of the British Heart Foundation (Food Commission, 2009), the foods and beverages available in UK leisure centres were recorded and focused on children's meals and meal deals, in addition to vending machine contents, availability of fresh fruit and vegetables and other aspects of the food environment (advertising, placement of snacks at children's eye level, product nutrition labelling and availability of nutritional information) (12). It was not stated if a validated tool was used to record this information. Semi-structured interviews with leisure centre managers were also conducted to identify any health

policies that were in place. Ashworth and colleagues used the ANGELO tool to record food and beverages available in vending machines and cafés in leisure centres and interviews were conducted with stakeholders (managers and leisure centre customers) to identify perceptions of the food environment (40). This methodology was described in more detail as part of a PhD thesis (26). Chaumette and colleagues also used an observational grid to record food and beverages available in cafés and vending machines in sport, recreation and cultural establishments in Quebec City and used the data to calculate frequency distributions, medians and averages of food items available. This information was combined with interviews with local stakeholders on their perceptions of these facilities to determine a more thorough description of the food environments (42).

Three studies determined the nature of food environments in children's social spaces based on consumption behaviours of customers. Irby and colleagues used standardised observational forms completed by 2 trained researchers to record all food and beverages consumed by players and the audiences at youth baseball games (44). Kenney and colleagues photographed foods and beverages consumed at summer day camps and recorded the name, brand, size and flavour of the food (45). Boelsen-Robinson and colleagues used a 12-item questionnaire to survey aquatic and leisure centre patrons about their food and beverage purchasing and consumption behaviours (41). This approach captured which foods and beverages children consumed, giving more insight into how they interacted with the food environment rather than simply observing what was available, but it did not capture the environment as a whole. Only 1 study accounted for brand and portion size and no study recorded food policies or health promotion initiatives.

There is a notable gap in the literature regarding assessment tools for recreation/activity centre food environments which takes food, healthy eating policies and health promotion initiatives into account. Most studies identified in this literature review simply recorded foods and beverages available. Applying a mixed methods approach provides a robust representation of the food environment in children's social spaces but, without using validated data collection methods, the validity and reliability of results are diminished. Although all mixed-methods studies used established qualitative methods, only 1 study combined this with a validated quantitative measurement tool (40). As mentioned previously, the tool used by Ashworth and colleagues, based on the ANGELO model, is effective in measuring obesogenic environments in a broad sense, for example on a national level (27), but it is not specific enough to account for the interaction between stakeholders in the food environment that is unique to children's social spaces – parents, children and vendors.

Food and nutrient profiling methods

Profiling methods used to categorise foods were country specific. In the UK, the Nutrient Profiling Model was used (46). In Australia, the state-wide guide, *'Healthy Choices: Food and Drink Classification Guide'* profiled foods accordingly (47). The 'Healthy Choices' guide classifies foods into 'green', 'amber' or 'red' in vending machines, retail outlets and catering facilities, similar to the UK's NPM. In Canada, with the exception of Nova Scotia's Healthy Eating in Recreation and Sport Settings (HERSS) criteria (43), foods and beverages were not profiled but frequencies of each food and beverage type, such as fruit juices,

French fries and muffins, were reported as percentages of the total number of food or beverages available.

The Nutrient Profiling Model was developed by the Food Standards Agency (FSA) in the UK in 2004-2005 to enable advertised foods aimed at children to be assessed and regulated (46). This model profiles foods based on healthy or unhealthy criteria in food: energy, total sugars, saturated fats and sodium (negative) and fruit, vegetables and nuts, fibre and protein (positive). Foods are scored on the basis of these 8 criteria and then classified as 'more healthy' or 'less healthy'. The system was initially developed in 2007 by Ofcom (communications regulator) in the UK to measure foods advertised during children's television programmes since foods high in fat, sugar and salt were banned.

The FSA established a 'Multiple Traffic Light System' for front-of-pack food labels (48) to display fat, saturates, sugars and salt content, per 100 grams or millilitres, as a guide for food producers to comply with the new European Union Law on Provision of Food Information to Consumers (Regulation (EU) No 1169/2011) (European Commission, 2011) (49). "Green" indicates low volume, amber indicates medium volume and "red" indicates high volume of a nutrient based on established nutrition claims for fat, saturates, total sugars and salt (50).

The School Food Trust, a non-departmental public body set up by the UK government in 2006, established a set of criteria in 2007 to help schools meet the new school food standards released by the UK government in the same year (51). The trust became an independent body and was renamed the Children's Food Trust in 2011 (52) and later closed in 2017 (53). The Trust produced criteria that categorised foods into 'healthier items', such as fruits, vegetables and free drinking water (encouraged in schools) and 'restricted items', such as high fat, salt or sugar foods (51). They also outline how schools can implement the new standards in vending machines and 'tuck shops'.

The Australian *'Healthy Choices – Food and Drink Classification Guide*' is based on previous food classification guides developed in Australia. This guide supports policy guidelines for sports and leisure facilities. It classifies foods into 'green', 'amber' and 'red' categories based on their nutrient profile, whereby 'red' foods include HFSS items with low nutritional value and 'green' items are whole foods that offer high nutrient value (47).

The Nutrient Profiling Model measures foods against nutritional recommendations. However, with this method, in-depth nutritional information about each item needs to be known to categorise foods. For example, the quantities of sugar, fat and salt need to be known per 100 g of each food. This is difficult if food is not pre-packaged such as in cafes within leisure centres. Nowak and colleagues recognised this barrier and used the School Foods Trust criteria to measure foods in cafés and canteens (14).

Six of the nine studies used nutritional profiling methods to define the healthfulness of the food environment. The Food Commission, Nowak and colleagues and Ashworth and colleagues used the FSA's Nutrient Profiling Model (NPM) to categorise food and beverages based on their nutritional content (12, 14, 40, 46). The Food Commission also classified products using the FSA's Multiple Traffic Light System.

The study by Nowak and colleagues additionally used the School Foods Trust criteria for unpackaged foods and drinks (14).

Boelsen-Robinson and colleagues used a traffic light profiling method based on the Australian "Healthy Choices" Criteria to categorise the healthfulness of food and beverages in leisure and aquatic centres (41). Irby and colleagues applied the Nutritional Environment Measures Survey (NEMS) criteria to categorise food consumed during youth baseball games as 'healthy' or 'unhealthy' based on (44). McIsaac and colleagues categorised food and beverages using the Healthy Eating in Recreation and Sport Settings criteria of 'Do Not Sell', 'Minimum Nutrition', 'Moderate Nutrition' and 'Maximum Nutrition' (43). Healthy Eating in Recreation and Sport Settings guidelines categories are based on the Food and Nutrition policy for Nova Scotia public schools which categorises food into "Do Not Sell", "Moderate Nutrition", "Medium Nutrition" and "Maximum Nutrition" as outlined in Table 2.

Table 2: Description of the food categories defined in the Healthy Eating in Recreation and Sport Settings (HERSS) voluntary guidelines

Key:	
Do Not Sell	These foods include any deep-fried foods, energy drinks and relaxation beverages
Less than 10% Minimum Nutrition	These foods have little to no nutritional value, and contain very high levels of added fat, sugar (or sugar substitutes) and/or sodium. They are often highly processed and commonly classified as "junk" foods, such as chocolate bars, hot dogs, sugar-sweetened beverages, and sports drinks, and any deep-fried products such as fries, poutine*, and onion rings.
No more than 40% Moderate Nutrition	These foods contain essential nutrients, some added fat, sugar and/or sodium and have undergone some processing. Examples include some brands of granola bars, baked potato chips and some brands of milk products.
At least 50% Maximum Nutrition	These foods are high in essential nutrients, low in saturated and artificial trans fats, have little or no added fat, sugar and sodium, and are minimally processed. Examples include fruits, vegetables, whole grains, some milk products and water.

Referenced by McIsaac et al. (43)

**Poutine is a traditional Canadian dish that consists of fries, gravy and curd cheese*

The 3 remaining studies defined the food environment using their own definitions of 'healthy' and 'unhealthy' or simply reported frequencies of available food and beverages, nutrition policies or nutritional value of food served (listed in Table 3). Chaumette and colleagues measured the healthfulness of the food environment based on the presence or absence of 'healthy' or 'unhealthy' options, where 'unhealthy' foods included soft drinks and fast food high in fat and sodium (42). They also compared the price of 'healthy' and 'unhealthy' items. The nutritional standards in recreational facilities in British Columbia were assessed based on Municipal Recreation Facilities Food Environment Audit Tool criteria which include food and beverages availability, in addition to nutritional policies and initiatives (13). As opposed to characterising these criteria as 'healthy' or 'unhealthy', they simply reported the contents of

snack bars and vending machines, and the details of the facilities' healthy eating policies and initiatives. Kenney and colleagues calculated the nutritional value and serving size of food consumed by children at summer day camps and determined the healthfulness based on nutrient profile of meals compared with Institute of Medicine standards for child-care programmes serving school-aged children (45, 54).

Just as it is necessary to use validated data collection methods, it is important to use a validated profiling method to accurately interpret data collected on the food environment. Although 6 studies used profiling tools, only 4 of the 9 studies identified in this literature review used both a defined measurement and profiling tool. Two studies simply presented their observations of the food environment as frequencies (%) of food and beverages availability (13, 42). As the results are not measured against an established standard, it is not clear how they defined a health-promoting environment. Although Kenney and colleagues did not use a profiling tool, they compared the nutritional value of food and beverage consumed at summer day camps with the Institute of Medicine standards to define the food environment (45).

Table 3: Literature assessing the food environment in settings in which children socialise

Study	Title	Country	Setting	Design	Food Environment Scoring System	Methods	Findings
Ashworth *et al.,* 2016	Influence of the obesogenic/ leptogenic food environment on consumer behaviour in leisure centres	UK	6 leisure centres in UK	Cross-sectional observational survey	FSA's NPM: "green", "amber" or "red"	Healthfulness of vending offer classified, frequently purchased items in cafes analysed and semi-structured interviews held with café users and managers	Majority of food offered was 'less healthy' in all centres
Boelsen-Robinson *et al.,* 2017	Examining the nutritional quality of food and beverage consumed at Melbourne aquatic and recreation centres	Australia	2,326 participants across 4 aquatic and leisure centres	Interviewer-administered surveys	Australian *Healthy Choices: Food and Drink Classification Guide*	Patrons were surveyed to ascertain food and beverage purchasing and consumption patterns. Foods categorised into 'green', amber' or 'red'	35% of participants consumed food or beverages at the centre; 92% of children who ate in centre café chose at least 1 'red' item; >35% of children who brought food from home brought a 'red' item
Food Commission, 2009	A fit choice? A campaign report on the provision of children's food in leisure centres	UK	35 publicly accessible leisure centres around London	Cross-sectional observational survey	FSA's NPM: "green", "amber" or "red"	Data collected on food available specifically for children, vending machines, food advertisement and labelling. Web and telephone interview conducted to determine if leisure centres had healthy eating policies	Children's meals offerings were mainly chips, nuggets, sausages and burgers; little health promotion material present; vending machines carried branding for HFSS products; all products in vending machines were HFSS; no healthy eating policies present in any centres; very little nutritional info available
Chaumette *et al.,* 2009	Food environment in the sports, recreational and cultural facilities of Quebec City: A portrait of the situation (In French; translated)	Canada	48 municipal facilities in Quebec	Cross-sectional observational survey	Frequencies of each type of food	Observational visits made to facilities to record the food and beverages available. 27 semi-structured interviews conducted with officials from local government and industry.	Most common foods offered were hot-dogs, potato crisps, chocolate bars, sweets and French fries. Most common drinks were fizzy drinks, fruit drinks, water and 100% fruit juice

Table 3 continued

Study	Title	Country	Setting	Design	Food Environment Scoring system	Methods	Findings
Irby *et al.,* 2014	The Food Environment of Youth Baseball	US	Youth baseball games in North Carolina	Observational surveys completed by 2 observers	Nutrition Environment Measures Survey (NEMS)	Environmental scan study of food consumed by players and attendees of games. Concession stands, snacks brought from home, vending machines and picnic areas were assessed	72% of snacks given to players by parents were 'unhealthy'; 26.8% of drinks offered with snacks were sugar-sweetened sports drinks; 53% of drinks consumed in the dugout during games were sugar sweetened
Kenney *et al.,* 2017	What Do Children Eat in the Summer? A Direct Observation of Summer Day Camps That Serve Meals	US	5 summer day camps for children in Boston, MA	Cross-sectional survey of meals served and brought from home	Validated nutrient profiling protocol	Over 5 days researchers recorded and photographed food and beverages served for each meal and brought from home. Size, brand and flavor were noted. On 2 days leftovers were photographed to assess intake	All camps met nutritional recommendations for breakfast and lunch but not for dinner. Most campers only consumed lunch at camp and brought less healthy food from home
McIsaac *et al.,* 2018a	Voluntary nutrition guidelines to support healthy eating in recreation and sports settings are ineffective: findings from a prospective study	Canada	30 recreational and sport settings (RSS) in Novia Scotia	Food and beverage environment audits	HERSS categories: Minimum nutrition; Moderate Nutrition; Maximum Nutrition	Audits of concessions and vending machines were conducted in RSS one year before implementation of the Healthy Eating in Recreation and Sport Settings (HERSS) voluntary guidelines and one year after	At baseline and follow-up, the majority of foods and beverages sold in concessions stands and vending machines were of low nutritional value. 'Do Not Sell' foods increased following the introduction of the guidelines
Naylor *et al.,* 2010	Publically Funded Recreation Facilities: Obesogenic Environments for Children and Families?	Canada	77 publicly funded recreation centres in British Columbia	Self-administered cross-sectional survey	Frequencies of each type of food	Recreation staff completed the Municipal Recreation Facilities Food Environment Audit Tool (MRFEAT) to assess policy, programs, practices and the food and vending machines in their facility	Most common beverages were fruit juice/ drinks (21%); most common side order was deep fried food (38%); on average 57% of beverage vending machines were SSBs; on average 67% of snack vending machines were crisps & chocolate bars
Nowak *et al.,* 2012	The food environment in leisure centres and health clubs	UK	67 leisure centres and health clubs in London	Cross-sectional survey of all London boroughs	School Food Trust criteria and Nutrient Profiling Method	All food and beverage options were recorded and the proportion of healthy options calculated	87% of venues sold SSBs; 50% of centres provided fruit options

Parent's and children's eating and food choice practice in children's social spaces

A total of 4 studies were identified that specifically investigated parent's and/ or children's food choice practice within children's social spaces. Two studies reported on the perspectives of patrons of recreational facilities in Canada but the focus of each study was different – Thomas and Irwin (55) explored patron satisfaction with the food sold in recreation facilities they attended for their children's hockey or ice-skating practice and Caswell and Hanning (56) looked more broadly at the experiences of adolescent hockey players and a small sample of parents within the food environment in recreation facilities. A third study interviewed parents about their perceptions of food available at their children's sporting events in Canada (57) and the fourth study reported on parent perceptions of out-of-home eating on the island of Ireland (30). Due to the contrasting topics, populations and methodologies of these studies, the findings were not directly comparable, but each gives insight into the perceptions of patrons who attend a variety of venues in which children socialise.

Overall, it was clear that parents were aware that the nutritional aspects of the food environments in the various settings were poor but that barriers such as cost and convenience inhibited them from changing their purchasing behaviour. Half of the parents interviewed by Thomas and Irwin (55) and the majority of adolescents interviewed by Caswell and Hanning (56) expressed feeling dissatisfied with the food options in the recreation facilities they attend. Parents interviewed in a later study by Thomas and colleagues in sports settings also expressed noticing their children eating more unhealthy food items in sports venues than at home and that they would prefer healthier options to be available (57).

In terms of the methods used, each study took a different approach. Studies from Thomas and Irwin and Thomas and colleagues only collected data on parental perceptions (55, 57). Thomas and Irwin with a self-administered paper-based survey completed by 269 adults (55) and Thomas and colleagues conducted 8 focus groups with 60 parents (57). A major limitation of Thomas and Irwin's (2010) methodology was that, although the survey was pre-piloted, the instrument itself was not validated, which limits confidence in the accuracy of the reported findings (55). The self-reported nature of the survey also allows for self-reporting bias. Additionally, these authors did not collect data on the socio-demographic status of their study participants that could potentially influence their perceptions of the food environments within the recreation facility. In this regard, McGuffin and colleagues approach was more robust (30). This research group carried out twenty-four focus groups with parents in Northern Ireland and the Republic of Ireland. The focus groups included a mix of gender, age, socio-economic status and rural and urban dwellers, which provided a more accurate representation of the general population. They also carried out informal interviews with 48 friendship pairs of children, who were not related to the parents interviewed, to explore their experiences with out-of-home food environments.

The only other study to report both parent and child food choice practices was Caswell and Hanning (56). They predominantly focused on the experiences of adolescent hockey players and interviewed 5 parents only, which provided a limited snapshot of the parental experience. Caswell and Hanning used a modified photovoice approach to collect data from the adolescent participants (56). This involved them taking photos for 2 weeks to capture their hockey practice and games. One-to-one interviews were then conducted to further explore their experiences and to give context to the photos. A selection of these photos were used as prompts in focus groups with the hockey players, and in interviews with the sample of parents. This approach was particularly useful when exploring community perceptions of the built and social environment as the combined use of photos and interviews encouraged an added level of self-reflection (58). However, this methodology relies heavily on the ability of participants to use digital technology and is, therefore, only appropriate for use with parents, but not with younger children.

The age of the children appeared to influence how parents interacted with the food environments in recreation and sports facilities. A sample of parents on the island of Ireland believed children's food choice was influenced by 'marketing', 'the presentation of food' and 'significant others' and proposed that younger children were influenced by food presentation, colourful packaging, free toys and television advertising in their food choice (30).

Thomas and colleagues reported that parents were more likely to bring snacks from home for younger children whereas older children would buy food from concession stands, which was observed to be less healthy (57). Adolescent hockey players interviewed by Caswell and Hanning reported choosing to leave straight after training instead of eating in the facilities (56) but parents attending similar facilities with children chose to buy food for them there due to convenience (55). This highlights one of the unique aspects of the food environment in settings where children socialise – the interaction between parent and child, and how that can influence food choice. Although the participants in Caswell's and Hanning's study were older than children in the other studies, their experiences act as an effective contrast to those of parents and younger children by highlighting that parents' options are limited when feeding children out-of-home (56). They were more likely to choose a less healthy option to save money, to avoid argument with their children and due to time constraints (30, 55). It is also worth noting that the adolescents interviewed by Caswell and Hanning cited the nutritional quality of food for 'recovery' as most important to their food choice decisions, which is in further contrast to the other 3 studies (56).

Convenience also appeared to be a priority for a sample of parents on the island of Ireland in which they expressed in focus groups that their priorities when choosing somewhere to feed their children included time constraints, price and their child's food preferences to avoid food waste and argument (30). Similarly, parents interviewed by Thomas and colleagues reported that it was more convenient for them to stop for fast food after their children's sports matches as it was usually too late in the evening to start cooking (57).

A particular theme that emerged in the study by McGuffin and colleagues (2015), and in a study by Thomas and colleagues (2012), was that eating out-of-home was considered to be a 'treat' whereby parents allowed their children to consume 'unhealthy' foods they would not have at home (30, 57). The fact that half of the parents interviewed by Thomas and Irwin were satisfied with the food offering, despite the other half claiming there were limited heathy options, could also suggest that health was not a priority for them when buying food in these facilities (55). Parents might prefer healthier options, but they are likely to choose unhealthier options if they are more convenient or less expensive. These sentiments were supported by their children who reported that they commonly chose where and what to eat, typically based on taste and personal preference (30).

Overall, it is difficult to draw definitive conclusions based on the literature available. The above studies were carried out in settings such as out-of-home, sports and in recreational facilities. Although these are broadly comparable to children's social spaces on the island of Ireland, they may still be missing important aspects of food choice practices within the broader range of possible venues in which children socialise, such as soft play areas. When looking at how to create health promoting environments in these settings, these studies emphasise the importance of convenience and price.

Table 4: Literature available describing food choice in settings in which children socialise

Study	Title	Country	Sample	Phenomenon of interest	Design	Findings
Caswell & Hanning, 2015	Adolescent perspectives of the recreational ice hockey food environment and influences on eating behaviour revealed through photovoice	Canada	Ice hockey players aged 11 to 15 years oold	Experiences of adolescent ice hockey players of the food environment within RFs	Photovoice; individual interviews with parents	It was anticipated that the food environment would have considerable influence on adolescent hockey player's food choice, however, other factors such as performance had stronger effect on food choice
McGuffin *et al.,* 2015	Parent and child perspectives on family out-of-home eating: A qualitative analysis	Northern Ireland	Parents and children (aged 5 to 12 years old) separately	Factors influencing family out-of-home food purchases	Informal interviews with friendship pairs of children; focus groups with parents	Parents indicated eating outside of the home was a 'treat'. Children reported their food choice was influenced by taste/ food preference and cost/ value for money
Thomas & Irwin, 2010	Food Choices in Recreation Facilities: Operators' and Patrons' Perspectives	Canada	Adult patrons of local recreational facilities (RFs)	Patrons' satisfaction of food provision in RF and operator's perceptions of providing healthy food choice	Un-validated self-administered qualitative survey of patrons	Half of patrons were satisfied with the choices offered in RFs. Reasons for dissatisfaction were limited healthy options available, poor food quality and variety and cost of options available
Thomas *et al*, 2012	Exploring Parent Perceptions of the Food Environment in Youth Sport	Canada	Parents of youth basketball players (aged 6 to 13 years old)	Types of food and beverages consumed by children in youth sport venues and parent perceptions of the food environment	Focus groups	Parents reported that their children consume 'unhealthy' food and beverages in sport settings. Most were dissatisfied with the food on sale but bought unhealthy food due to time constraints and limited healthy food options

Facilitators of and barriers to healthy eating at sports clubs, leisure centres and play centres relevant to children

In total, 7 papers were identified which investigated facilitators of and barriers to improving the healthfulness of the food environment in settings where children socialise and participate in physical activity. Six were carried out in children's social spaces in Canada and one in leisure centres in the UK. Four studies took mixed method approaches to evaluate food environments in recreation and leisure centres, while three were purely qualitative. Overwhelmingly, the most common barrier identified was the cost of increasing the availability of healthy alternatives. Most studies reported only barriers but one facilitator that was frequently described was support from external bodies, such as the government, in implementing healthy eating initiatives.

A variety of approaches were taken to identify barriers to and facilitators of creating healthy food environments: 4 studies conducted semi-structured interviews with facility stakeholders; 1 carried out telephone interviews; 1 held focus groups and 2 implemented a capacity-building intervention in recreation and sport facilities.

Three studies were led by researchers from the University of Alberta that explored factors that influenced recreational facilities to implement the Alberta Nutrition Guidelines for Children and Youth (ANGCY) (59, 60), and the perceptions of industry stakeholders towards implementing the ANGCY (61).

The first study conducted telephone interviews with 151 managers of recreational facilities and found that the main barriers to adopting the ANGCY were observed preferences of customers for unhealthy items and the inconvenience of obtaining, preparing and storage of healthier options, although several managers expressed no barriers to adopting the guidelines (60). In semi-structured interviews with 5 managers, the second study explained further the barriers faced by managers who implemented the guidelines (59). They expressed struggling with the complexity of the guidelines, with receiving no resources or support from the government, the limited availability of ANGCY-compliant options, competitive pressure and the resulting loss of revenue. Managers who had embraced the guidelines reported that their own attitudes and perceptions of the benefits of implementing the guidelines had facilitated the change. Several who had not implemented them stated they would be willing to make changes if there was a successful example to follow. These sentiments were mirrored in interviews conducted with 7 different recreation facility managers by the same researchers in 2012, 5 from organisations implementing the guidelines and 2 from organisations who were not (61). In all studies, managers were hesitant to make changes due to fear of losing sales to competitors, although overall, were in support of measures to improve the food environment in their facilities. They reported a preference for governmental enforced changes across the entire sector to remove the competitive pressure of voluntary implementation.

Similar findings were reported by McIsaac and colleagues who carried out telephone interviews with 10 representatives from recreation and sport settings in Nova Scotia (62). The main barriers to providing

heathier food in their facilities were cultural norms associated with different sports, the belief that the customers should be responsible for their own decisions and the perceived financial implications from provision of healthy food compared with unhealthy options. In terms of food served in different sporting venues or events, the managers identified baseball and hockey as sports with unhealthy food traditions and anticipated their supporters being resistant to purchasing healthier food.

Naylor and colleagues ran focus groups with recreation centre service providers to identify issues related to changing the food environment (13). Again, the inconvenience of preparing and storing healthier food was identified as a major barrier, as was the difficulty of accessing healthy food from suppliers. They also expressed that more education was required to inform them and the public about healthy eating practices so they can accurately implement change. The main facilitator of change identified was support in the form of partnerships with external bodies and educational resources such as posters and leaflets for the facilities to use.

Ashworth and colleagues conducted semi-structured interviews with key stakeholders of UK leisure centres including café customers and managers to identify the nature of the food environment from the user's perspective and to identify barriers faced by managers to creating a health-promoting environment (40). As with the Canadian recreation centre managers, UK managers perceived consumer preference for unhealthy items to be the main obstacle to providing healthier options as well as the complexity of providing nutritional information. Both café users and managers suggested providing educational resources in the café could encourage customers to make healthier choices.

Two studies reported the success of providing capacity building interventions (such as training, resources and technical support) to facilitate the implementation of regional nutrition guidelines (8, 63). They both reported a greater increase in healthy food and beverage options at follow-up in the facilities that received the capacity-building intervention compared with those who were simply supplied with guidelines. Naylor and colleagues assessed the success of training, resources and technical support provided to 21 communities as part of the "Healthy Food and Beverage Sales in Recreation Facilities and Local Government Buildings" initiative , a programme provided to local governments in British Columbia to improve the food environments in recreation facilities (63). On comparison with 23 communities that did not receive the programme, they found that the supported communities self-reported a greater improvement in the food environment of their recreation facility. All measures of the food environment were self-reported by facility managers and staff but the questionnaire tool and vending audits were pilot tested in a previous study (64), and the audit received high inter-rater reliability scores in both the pilot test and later study (63), thereby strengthening the self-reported results.

Olstad and colleagues conducted a randomised controlled trial with recreation and sport facility staff in British Columbia, Alberta and Nova Scotia to identify if capacity-building facilitated the implementation of regional nutrition guidelines better than simply providing the guidelines (8). The facilities that received the capacity-building intervention demonstrated a greater increase in healthier options at follow-up and were the only group to introduce new facility nutrition policies. Their findings support

sentiments expressed by managers interviewed in previous studies where the need for support in implementing guidelines was expressed (13, 61).

Very few studies have been conducted to explore the facilitators of and barriers to implementing changes to the food environment in children's social spaces, particularly outside of Canada. There is widespread concern surrounding changes to the food environment among stakeholders of such venues due to customer preference for unhealthy options and the difficulty in sourcing healthy options. A major limitation of these studies is that most dealt only with barriers without exploring facilitators of change. In the studies that did explore these, a potential solution that was expressed was to provide support and education to staff to implement healthy eating guidelines for the food environment in which children socialise (suggested approaches included resources such as booklets or online material providing guidance on how to 'health proof your menu' such as substitutions/swaps; guidance on advertising; training/skills workshop on prepping healthy food possibly including examples of 'successful' vendors who have made it work). Although the field of research investigating these particular environments is sparse, it is receiving more attention in recent years with more assessments being conducted and measurement tools being developed. Several studies have noted that although healthy eating policies, guidelines and initiatives have been implemented in a range of facilities for children, the food environment consistently fails to reach acceptable nutritional standards. Qualitative exploration of the factors has provided some understanding of the reasons for this in previous studies and should be considered a necessary step of food environment evaluation.

Table 5: Literature available on facilitators of and barriers to healthy eating in settings in which children socialise

Study	Title	Country	Sample	Phenomenon of interest	Design	Findings
Ashworth *et al.*, 2016	Influence of the obesogenic/ leptogenic food environment on consumer behaviour in leisure centres	UK	6 leisure centres in UK; 15 café users, 5 catering managers; 6 centre managers	Perceptions of the food environment	Cross-sectional observational survey; Semi-structured interviews	Majority of food offered was 'less healthy' in all centres
McIsaac *et al.*, 2018b	"A tough sell": Findings from a qualitative analysis on the provision of healthy foods in recreation and sports settings	Canada	10 recreation centre stakeholders	Attitudes towards implementing a healthy eating policy	Semi-structured telephone interviews	Barriers identified were cultural norms associated with foods in specified sports settings; personal choice and responsibility; and financial implications of healthy food provision
Naylor *et al.*, 2010	Publically Funded Recreation Facilities: Obesogenic Environments for Children and Families?	Canada	77 publicly funded recreation centres	Facilitators of and barriers to changing the food environment	Semi-structured focus groups	Barriers were the need to educate staff and customers on healthy eating; inconvenience of preparing healthier options; accessibility of health supplies. Facilitators were partnerships with external organisations; health promotion resources
Naylor *et al.*, 2015	An Intervention To Enhance the Food Environment in Public Recreation and Sport Settings: A Natural Experiment in British Columbia, Canada	Canada	44 communities associated with recreation facilities	Facilitator of improving food environments in recreation facilities	Organisational capacity building intervention	More improvements achieved in the food environments of the intervention communities

Table 5 continued

Study	Title	Country	Sample	Phenomenon of interest	Design	Findings
Olstad *et al.,* 2011a	Improving children's nutrition environments:A survey of adoption and implementation of nutrition guidelines in recreational facilities	Canada	151 managers of recreational facilities in Alberta	Attitudes towards implementing the ANGCY	Cross-sectional telephone survey	Barriers to adoption and implementation were observed customer preference for unhealthy options and inconvenience of obtaining, preparing and keeping healthier options. Several managers reported no barriers to implementing the policy
Olstad *et al.,* 2011b	Implementing the Alberta Nutrition Guidelines for Children and Youth in a Recreation Facility	Canada	6 recreational facility managers interviewed; food environment of 1 recreational facility observed by 2 researchers; Policies and sales data reviewed	Food and beverage availability; nutrition profile of vending machines; Barriers to implementing the ANGCY	Semi-structured interviews; 4 measures used to assess aspects of the food environment	Barriers to implementation of the policy were perceived financial cost of healthier items and observed personal preference of children. Facilitators to implementation were the managers' attitudes to change, perceived benefits of implementation and a successful example of implementation
Olstad *et al.,* 2019	Eat, play, live: a randomized controlled trial within a natural experiment examining the role of nutrition policy and capacity building in improving food environments in recreation and sport facilities	Canada	49 recreation and sports facilities from 3 guideline provinces: British Columbia, Alberta and Novia Scotia	Facility capacity and nutrition policy development; Vending machine and concession audit	Organisational capacity building intervention	The guideline and capacity building group demonstrated a higher increase in healthier options at follow-up and 17.6% had introduced new facility nutrition policies, compared to none in the other groups

Market reports, policies and regulations

Policies specific to children's social spaces

There are several approaches to regulating the food environment in spaces where children spend their time, although guidelines specific to settings outside of school are rare. The school food environment has long been the focus of interventions to promote healthy eating among children and several countries have established school food guidelines (65), including Australia and the UK (66-68). A key difference between the food environment in schools and children's social spaces is that in contrast to the limited menu of a school canteen which is typically under the control of the school or catering company, the food and beverages on offer in recreation centres are under the influence of customer preference and profitability. Although the food on offer in both settings should meet national nutrition standards, the practicalities of achieving that is vastly different and each require tailored guidelines.

No policies or guidelines were identified in Ireland or the UK specifically for children's social spaces. Regional nutrition policies are in place only in Canada (n = 8) and Australia (n = 1) where province or state governments have developed guidelines for healthy food and beverage provision in recreation facilities. 8 out of 11 provinces in Canada have developed toolkits based on Canadian healthy eating guidelines to assist recreation facility staff in creating health-promoting food environments in their workplaces, the earliest being released in Manitoba in 2009 (69-76). Details of the guidelines are outlined in Table 6.

Similarly, the state government of Victoria, Australia released policy guidelines for sport and recreation centres in 2016 (77) based on the *Healthy Choices: Food and Drink Classification Guide* (47) in order to support facilities implement healthy eating policies. Predating the introduction of the Victoria state guidelines, a leisure centre in the region implemented its own policy in 2008 to develop a health-promoting environment in its own facility (78) that was based on Victoria's state guidelines for school canteens (79). The focus of the policy was ensuring the contractors catering for the centre provided healthy options, in accordance with national nutrition guidelines (80), in addition to meeting hygiene, health-promotion and customer experience requirements. Furthermore, state governments in Queensland and Western Australia have now created online instructions, including educational resources, for recreation staff to use to create health-promoting food environments in their facilities (81, 82). Although the other 3 states have not yet introduced guidelines specific to children's social spaces, a progress update report released this year by the Australian Prevention Partnership Centre recommended that a national policy for healthy eating in sports and recreation settings be implemented by 2020 (83).

Table 6: Government policy and guideline documents for healthy food environments in settings in which children socialise

Organisation	Document	Country	Year	Target Audience	Document/Guideline Type	Aspects of Guidelines
Queensland Government	*Food for Sport Guidelines*	Australia	-	Recreation facility staff	Online resource	• Food and beverage options (including information on nutrition standards, recipe ideas and healthy alternatives) • Food placement • Pricing • Promotion • Self-evaluation
Government of Western Australia Department of Health; Fuel to Go & Play	*Healthy Canteens in Sporting Clubs and Leisure Centres*	Australia	-	Recreation facility staff & customers	Online resource	• Food and beverage options (including information on nutrition standards, recipe ideas and healthy alternatives) • Food placement • Healthy eating policy template • Food labelling information
Victoria State Government	*Healthy Choices: Policy Guidelines for Sport and Recreation Centres*	Australia	2016	Recreation facility staff	Regional guidelines	• Food and beverage options (including information on nutrition standards, recipe ideas and healthy alternatives) • Self-evaluation • Healthy eating policy template • Food service agreement template for vendors
Move to Healthy Choices Committee, Manitoba	*Making the Move to Healthy Choices: A Toolkit to Support Healthy Food Choices in Recreation Facilities*	Canada	2008	Recreation facility staff	Regional guidelines	• Food and beverages sold (including recipe ideas and healthy alternatives), • Marketing and promotion • Food safety • Accompanied by separate document for healthy eating policy development in these facilities
Healthy Eating Physical Activity Coalition of New Brunswick	*Healthy Foods in Recreation Facilities*	Canada	2009	Recreation facility staff	Regional guidelines	• Food and beverages sold (including recipe ideas and healthy alternatives) • Marketing and promotion
Government of Alberta	*Alberta Nutrition Guidelines for Children and Youth: A Childcare, School and Recreation/Community Centre Resource Manual*	Canada	2012	Facility staff	Regional guidelines	• Food and beverages (including Recipe ideas and healthy alternatives) • Serving sizes • Healthy eating policy template • Classifies food into 'choose most often'; 'choose occasionally' and 'choose least often'

Recreation newfoundland and Labrador	*Making the Move to Healthy Choices: A Healthy Eating Toolkit for Recreation, Sport and Community Food Service Providers*	Canada	2013	Recreation facility staff	Regional guidelines	• Food and beverages sold (including recipe ideas and healthy alternatives), • Food and vending position • Marketing and promotion • Food safety • Categorises food and beverages into 'Serve most', 'Serve moderately' and 'Not included
Nova Scotia Department of Health and Wellness	*Healthy Eating in Recreation and Sport Settings (HERSS) Guidelines*	Canada	2014	Recreation facility staff	Regional guidelines	• Food and beverages sold (including recipe ideas and healthy alternatives) • promotions/marketing/sponsorship • Nutrition education for staff • Food safety • Breastfeeding • Portion sizes • Dietary requirements • Classifies food into: 'Maximum nutrition' to choose most often; 'Moderate nutrition' to choose occasionally; and 'Minimum nutrition' not be permitted in RSS
Ontario Society of Nutrition Professional in Public Health	*Getting Started with Healthy Eating in Your Recreation Setting*	Canada	2017	Community members and health promotion partners	Regional guidelines	• Food and beverage options (including information on nutrition standards, recipe ideas and healthy alternatives) • Educational resources on profitability of healthier options, • Food placement and pricing, • Promotion, • Monitoring, • Healthy eating policy development information
Saskatchewan Health Authority	*Healthy Food for my Recreation Setting: Nutrition Standards for Saskatchewan*	Canada	2018	Recreation facility staff	Regional guidelines	• Food and beverage options (including information on nutrition standards, recipe ideas and healthy alternatives) • Breastfeeding policy • Categorises food as 'Offer Most Often', 'Offer Sometimes' and 'Offer Least Often food'

National and regional policies specific to children

There are a variety of guidelines and regulations for food served to children in broader 'out-of-home' contexts that can be applied in spaces where they socialise. The Nutrition and Health Foundation (NHF) and Restaurants Association of Ireland (RAI) collaborated on the 'Kids Size Me' initiative to develop voluntary guidelines for the provision of child-sized portions of adult meals in restaurants and cafés (84). The guidelines provide simple instructions and suggestions for preparing smaller portions. While it is not specific to children's social spaces, the initiative is highly applicable to food sold in these environments. Although the guidelines are publicly available, it is not clear if the initiative is still in effect, or how many restaurants have voluntarily implemented them. Public Health England (PHE) released a strategy document and accompanying toolkit for local councils in 2017 with the aim of encouraging them to support local businesses to change the food and beverages they provide to make it easier for families with children to make healthier choices (38). However, to our knowledge, there has not been an evaluation of either the NHF's and RAI's 'Kids Size Me' initiative or PHE's 'Strategies for Encouraging Healthier 'Out of Home' Food Provision', therefore there is no evidence of how effective they are in practice.

Restrictions on marketing and advertising of foods that are high in fat, sugar and/or salt directly to children and in settings where children spend their time are another common approach to make it easier for children to develop healthy eating habits. were established in 2017 as part of the Healthy Ireland initiative (37). The guidelines apply to digital, out of home and print media, in addition to cinema, commercial sponsorship and retail product placement in the Republic of Ireland and restrict advertisement of HFSS foods directly to children and in settings primarily used by children, such as children's social spaces and schools. The rules of the guidelines are in line with the EU food industry pledge to change how they advertise to children (85), the Advertising Standards Authority of Ireland (ASAI) Code of Standards for Advertising and Marketing Communications (86), the Broadcast Authority of Ireland (BAI) General and Children's Commercial Communications Code (87) and the WHO Set of Recommendations on the Marketing of Foods and Non-Alcoholic Beverages to Children (88).

Policies relevant to children's social spaces

Healthy eating and physical activity policies have been developed on global (89) and national levels (90-94) to outline targets and actions needed to reduce childhood obesity, including creating health-promoting environments in recreational settings. These guidelines apply to all settings and can be adapted to guide facilities specific to children to provide healthier food and beverage options (46, 47, 95).

In line with national health strategies, sugar taxes were introduced in the UK and in Ireland in 2018 to reduce the number of SSBs consumed and to encourage reformulation of their sugar content (35, 36). These will have an indirect impact on the food environment in children's social spaces, such as sports and soft play centres that sell high sugar beverages.

In the UK, the Government Buying Standards for Food and Catering Services are mandatory guidelines for the provision of food and beverages in government facilities and NHS hospitals and are recommended

for all public sector facilities to maintain food environments in line with national nutrition guidelines (96). These can be applied to any environment, including those in which children socialise.

There is a clear a lack of regulations specifically for spaces where children socialise. In Canada where there are established guidelines for recreational centres on a provincial level, municipalities have taken the initiative to implement healthy eating policies in local settings where children and adults play sports and socialise (97). Representatives from companies supplying food and beverages to recreation facilities in British Columbia expressed overall support for the guidelines and 56% of the businesses represented had implemented changes to better meet the recommendations, while other businesses were already compliant (98).

In Ireland and the UK national nutrition guidelines, codes of practice for advertising and marketing to children and recommendations for out of home eating, such as the 'Kids Size Me' initiative and PHE's healthier 'Out-of-home' eating toolkit for local councils, could feasibly be applied in the context of children's social spaces to establish health-promoting food environments. Many of these guidelines and initiatives are currently voluntary and there is evidence to suggest guidelines are more effective in the context of recreation facilities when they are mandatory for all facilities in order to remove the fear of profit loss through competition (61). Based on the developments observed in Canada and Australia, there is value in establishing clearly defined, step-by-step healthy eating guidelines specific to recreational facilities that cater to children. Crucially, the accompaniment of nutrition guidelines for recreation facilities with a toolkit to assist staff with implementation appears to be most successful.

Conclusion

The literature suggests the food environments in spaces in which children socialise are not helpful or favourable to a healthy diet and that there are several barriers inhibiting parents from making healthier food choices for their children. To date, no assessment has been conducted on the food environment in children's social spaces in Ireland, but studies conducted in the UK, Canada and Australia found the food on offer was predominantly high in fat, sugar and/ or salt and beverages were mostly high in sugar. These observations were backed up by qualitative studies exploring food choice practices of parents and children who attend social and activity centres such as sports centres and general out-of-home food outlets. Parents observed their children eating 'unhealthy' food in sports venues due to a lack of healthier alternatives. Although most parents were dissatisfied with the food options available, many viewed eating out as a treat or prioritised cost and convenience over health and, therefore, made exceptions when buying food for their children in these venues. Even though healthy eating guidelines specifically for recreation and leisure facilities are in place in most Canadian provinces and Australian states, they do not appear to be achieving their objectives and more support needs to be provided to assist facilities to implement them. The main barrier reported by facility managers to meeting the guidelines was the perceived preference among customers for 'unhealthy' options, and the expected financial loss associated with changing the food and beverages on offer. However, most studies reported that recreation and leisure facility operators were aware of and interested in implementing healthy eating guidelines and that support from local government or health bodies in educating staff and

implementing the changes would be a major facilitator of change. Considering social spaces for children frequently include settings that encourage physical activity, research is needed to establish the healthfulness of the food environment of these facilities on the island of Ireland. Healthy eating guidelines for recreation facilities that have been established in Canada and Australia provide step-by-step guidance for operators to create health-promoting environments and have the potential to be adapted for use internationally.

4 Methods

Background

'Social spaces' are a novel concept within food environments and to our knowledge, no research to date has been carried out into the food environment within these specific locations on the island of Ireland. For the purposes of this research, 'social spaces' were defined as any type of centre children attend to socialise, play and/ or exercise. Examples include indoor climbing walls, indoor soft play centres, indoor trampoline centres, sports centres, swimming pools and community-based parent and toddler groups.

This research project was a mixed methods study. Both quantitative and qualitative research elements were used to bring different perspectives and understanding on the food environment in social spaces. An initial quantitative, audit study of the food environment within children's social spaces was carried out, followed by qualitative interviews with key stakeholders investigating their motivations and beliefs surrounding food provision within children's social spaces.

Description of food available in children's social spaces

The aim of the initial quantitative study was to collect data on the types of foods and drinks available in social spaces on the island of Ireland. This section of the report will discuss the methodology for the audit.

Background

An audit of different types of centres was carried out across the IOI to capture the range of foods on offer in children's social spaces. Regions were selected to include Dublin, Cork, Galway, Waterford, Limerick, Clare, Mayo, Belfast, Derry/Londonderry and Enniskillen. It was considered that the spread of centres across regions would give good coverage of different sizes of centres, urban and rural locations, low and high deprivation index and public and privately-owned centres.

Ethical approval

An application for ethical exemption was made to University College Dublin (UCD) Research Ethics Committee on the basis that no sensitive information was being collected. Ethical exemption was granted (Registration number: LS-E-18-222-Sloan-Murrin) in November 2018. Ethical approval was also sought from Queen's University Belfast (QUB) for the qualitative aspects of the project. Ethical approval was granted in July 2019 (Registration number: 07/19/MurphyB).

Centre sampling

An online mapping programme was initially used to search for children's social spaces. Each of the 10 regions selected for inclusion were used as online search terms for social and activity centres (Dublin, Cork, Galway, Limerick, Waterford, Clare, Mayo, Belfast, Derry/Londonderry and Enniskillen). Other search terms included different types of centres such as "swimming pool", "children play centre", "children sports centre", "soft play centre". Region and type of centre were combined to give searches such as "swimming pool Dublin"; "soft play centre Cork" etc.

Republic of Ireland – community-based groups

Community-based non-commercial social spaces were less readily located through an online presence. These types of social spaces were located through targeted website searches such as through parenting fora and recreation websites. Through these searches, Family Resource Centres were identified as hosting community-based non-commercial groups for parents and children. Family Resource Centres were considered ideal centres to include in this study as they are under the remit of Túsla, the Child and Family Agency, which is the Irish State Agency responsible for improving wellbeing and outcomes in children. It was considered that if nutrition policies were implemented in children's social spaces following this study that centres under the remit of a State Agency would be most open to implementing these policies. Family Resource Centres deliver "universal services to families in disadvantaged areas based on the life-cycle approach" through 121 centres across the Republic of Ireland (99).

Northern Ireland – community-based groups

In Northern Ireland, all 5 Health and Social Care Trust websites were searched for community-based parent networks: Belfast Health and Social Care Trust; Northern Health and Social Care Trust; South Eastern Health and Social Care Trust; Southern Health and Social Care Trust; and Western Health and Social Care Trust. Through searches of Trust websites, the following websites were identified as potentially suitable links to community-based groups: Family Support NI, Parenting NI, Action for Children, Netmums. These websites were searched for any parent, child or toddler groups listed. Groups that met in community centres and churches were included. SureStart groups and Council-run play centres were considered ideal venues to include and locations were identified from these websites and included on the list of centres to approach.

Belfast County Council Play Service was also identified as an appropriate social space to study. Belfast County Council Play Service provides play opportunities for children in the community. It was considered that centres with affiliations with county councils would be able to self-audit, following the study.

A total list of 407 centres were identified on the island of Ireland from the 10 regions selected.

Centre categorisation

Centres in each region were subsequently grouped into categories, based on type of centre such as activity centres, public sports centres, swimming pool etc (see Table 7). Centres were selected at random from each

category to ensure a good representation of each type of centre within each region. A set of 3 lists for each region was prepared to ensure adequate numbers of centres were available if there were any that refused to participate.

Table 7: Categories of centres providing social spaces for children on the island of Ireland

Category	Type of centre
1	Kids' party centre
2	Soft play centre*
3	Activity centre (climbing walls and trampoline centres)
4	Council-run leisure centres or swimming pools
5	Public community centres
6	Public sports centres, leisure centres or swimming pools
7	School swimming pool or leisure centre
8	Private swimming pool or leisure centre
9	Hotel swimming pool or leisure centre
10	Community play group
11	Council-run community play centre

*Soft play centres are indoor facilities with play equipment made from soft materials.

Deprivation index measurement

Venues were also categorised according to deprivation index scores. This was completed using the An Pobal Deprivation Map in the Republic of Ireland (by Small Area 2016) (100)[1] and the Northern Ireland Neighbourhood Information Services (NINIS) website in Northern Ireland (by Small Output Area 2017) (101)[2].

[1] Haase, T. and Pratschke, J. (2017) The 2016 Pobal HP Deprivation Index for Small Areas. Available at: https://www.pobal.ie/app/uploads/2018/06/The-2016-Pobal-HP-Deprivation-Index-Introduction-07.pdf

[2] Northern Ireland Statistics and Research Agency (2017) Northern Ireland Small Areas. Crown Copyright. Available at: https://www.nisra.gov.uk/support/geography/northern-ireland-small-areas

Republic of Ireland deprivation measurement of centres

Centres in the Republic of Ireland were located on the Pobal HP Deprivation Index map using their listed address. If the address was not found on the map, the building was identified on the map by consulting with Google Maps ® to identify the building on both maps and then finding the deprivation index by small area.

For categorising centres within urban and rural areas in the Republic of Ireland, the Central Statistics Office (CSO) definition of aggregate rural areas having less than 1,500 inhabitants was used to define areas. The Small Area Populations (SAP) 2016 data (Table E3005: Population 2016 by Age Group, Sex, Towns by size and Census Year) from the CSO was used to categorise small towns (102). If an area listed on the centre address could not be found on this list, an online mapping tool was consulted to determine if the area was too small to be listed on the CSO SAP 2016 dataset. If this was the case, the next closest cluster of dwellings was located using the online mapping tool and was identified as being urban or rural.

For example, one centre was identified using the online mapping tool and the location was not included in the Small Area Populations (SAP) list. As a result, the next closest area was identified using the online mapping tool and was found to be rural. The HP Deprivation Index in the ROI developed by Pobal is based on 8 different categories (see Table 8) (103).

Table 8: Deprivation categories outlines in An Pobal's Deprivation Index by Small Area 2016

Deprivation Indices	Deprivation Category*
Extremely affluent	Low deprivation
Very affluent	Low deprivation
Affluent	Low deprivation
Marginally above average	Low deprivation
Marginally below average	High deprivation
Disadvantaged	High deprivation
Very disadvantaged	High deprivation
Extremely disadvantaged	High deprivation

* This categorisation was applied for the purposes of the present analysis.

Deprivation index – Northern Ireland

For centres in Northern Ireland, the Northern Ireland Neighbourhood Information Services (NINIS) website was used. This website contains interactive maps identifying deprivation; Interactive Content – Deprivation – NIMDM 2017 – Super Output Areas (101).

Areas were allocated a number depending on deprivation. This ranged from 1 – 890, with a score of '1' or Category 1 being the most disadvantaged area and a score of '890' or Category 10 being the most affluent area. On the NINIS website, these values were broken down into 10 categories (see Table 9).

Table 9: Deprivation categories outlined in the Northern Ireland Multiple Deprivation Measure 2017

Range	Category	Deprivation category*
1-89	1	Low deprivation
90-178	2	Low deprivation
179-267	3	Low deprivation
268-356	4	Low deprivation
357-445	5	Low deprivation
446-534	6	High deprivation
535-623	7	High deprivation
624-712	8	High deprivation
713-801	9	High deprivation
802-890	10	High deprivation

* This categorisation was applied for the purposes of the present analysis.

Areas were ranked from most deprived (rank 1) to least deprived (rank 890). The ranking was based on 7 domains of deprivation – (1) Income, (2) Employment, (3) Healthy and Disability, (4) Education, Skills and Training, (5) Access to Services, (6) Living Environment and (7) Crime and Disorder.

Both Republic of Ireland and Northern Ireland deprivation indices were calculated using different methodologies and so it was not possible to compare categories between the two regions. For this reason, both indices were divided into 'Low deprivation' and 'High deprivation'. This enabled comparison to be made across both groups and, therefore, across the island of Ireland.

Recruitment and inclusion/ exclusion criteria

Centres were contacted by Amárach Research initially by phone and invited to take part in the study. Permission to take part in the study was sought from centre managers and if managers were not available, a return phone call was arranged when the centre manager was available. Repeat attempts to contact the centres were continued until centres either agreed to take part or refused.

Screening questions were used to determine the suitable inclusion of centres, particularly if centres provided food or beverages on their premises. If centres only provided food and beverages through vending machines,

these centres were still included as food was still available to purchase and would still represent food offered in children's social spaces.

The number of centres contacted and the number of refusals to participate are described in Table 10:

Table 10: The number of centres offering social spaces for children contacted on the island of Ireland and the number of refusals

Location	Total number of Centres (n)	Did Not Meet Inclusion Criteria	Refused	Additional Permission Required	Closed Down	Not Listed	Not Contactable*	Successfully Recruited
Dublin	28	2	5	4	1	0	0	10
Cork	23	3	4	1	0	0	1	8
Galway	15	0	1	0	0	1	0	5
Limerick	14	2	1	1	0	0	0	7
Waterford	10	0	0	0	0	0	0	5
Clare	15	3	0	1	0	0	0	5
Mayo	15	0	0	1	0	0	0	5
Belfast	45	9	7	18	0	0	0	10
Derry	19	2	3	6	1	0	0	5
Enniskillen	12	2	2	1	1	0	0	5
Total	**196**	**23**	**23**	**33**	**3**	**1**	**1**	**65**

* Certain centres' telephone lines had placed a setting on their contact phone number, preventing market research agencies from contacting them

Audit tool development

An appropriate tool to measure the food environment in children's social spaces that was relevant to the island of Ireland was not identified during a review of the literature, so an audit tool was developed specifically for this purpose. When designing the audit tool for children's social and activity centres, it was clear that a comprehensive tool would be required to capture the wide variety of food provision methods such as canteens, centre cafés or shops and vending machines. The literature also highlighted the importance of reliability within the audit tool and of measuring marketing and health promotion events within the food environment in these spaces. Researchers in Norway working with the International Network for Food and Obesity / Non-communicable Diseases Research, Monitoring and Action Support (INFORMAS) (www.informas.org) were consulted during the audit tool development phase. Before beginning the audit development, one social space venue was visited to identify the types of foods provided in such settings.

A list and a brief description of the audit tools that informed the development of the audit tool we used to evaluate children's social spaces can be found in Appendix I.

Several audit tools were reviewed and considered as part of the development process. As each tool was designed for different objectives and no single tool matched our requirements, certain elements of the tools were adapted for the purpose of the present research. The Food Environment Audit for Diverse Neighbourhoods (FEAD-N) (104) provided a useful measure to capture the whole food environment within stores which was incorporated into the present audit tool. The checklist design approach was adapted from the *'Bridging the Gap – Food Store Observation Form – BTG-FSOF'*. The BTG-FSOT tool was tested for reliability and demonstrated good agreement on identifying products within a store (105). The Bridging the Gap researchers also developed a tool specific to fast food outlets which was adapted for the audit tool used in the present study. The scoring system used in the audit tool was adapted from the systems developed in The Nutrition Environment Measure Survey in Stores (NEMS-S) (106) and the system used by Roy and colleagues (107). Points were awarded if healthy options are available and no points awarded for less healthy options. The 'healthy' foods included in the present tool were based on the food items listed in the *"Minimum Nutritional Standards for catering in health and social care"* (108). The HSE "Healthy Vending Policy – Audit of Vending Machines" (109) were used to inform the design of the vending machine section of the audit form.

Audit tool testing and pilot

Once the audit tool was developed, it underwent a number of reviews and revisions. The first draft of the audit tool was reviewed internally by UCD researchers. Once revised, the tool was reviewed by public 3 health nutrition experts and 1 paediatric dietitian.

The tool was subsequently pilot tested in a centre with a nutrition researcher and fieldworker with a non-nutrition background. The reason for testing with a fieldworker with a non-nutrition background was that the audit tool was designed to be easy for auditors to complete and one which would not require the auditor to have technical food product or nutrition knowledge. The tool was adjusted based on the feedback from the pilot testing. The tool was then sent to Amárach Research to pilot test in three locations to ensure their fieldworkers were able to complete the audit tool. Prior to pilot-testing by the market research company, the audit tool was uploaded onto hand-held devices to enable data to be entered into a database. This modified the audit tool from a paper-based format to an electronic format.

The final audit tool was comprised of a simple checklist which should take no more than thirty minutes to complete. This was desirable for centre managers so that the form could be completed thoroughly and accurately and did not interfere with the operation of the centre.

When developing the audit, a number of products were identified that could be difficult to differentiate from one another in the audit. As products such as diet and regular soft drinks, fruit juices and fruit drinks and smoothies can vary widely in nutritional content, it was considered that the difference between diet soft

drinks (without added sugar, with added sweeteners) and regular soft drinks (with added sugars) would be an important distinction to be made. This was also the case for 100% fruit juices, as they can be easily confused with fruit drinks with added sugar and sweeteners. Smoothies were also considered to vary widely in nutritional quality depending on brands. Some contain milk, others contain up to two servings of fruit per serving. As a result, it was decided that taking a photo of regular soft drinks and smoothies to ensure the accuracy of categorisation would be the best method to accurately differentiate between products.

It was also considered necessary to take photographs of vending machines, if permission was given. A checklist of products available in vending machines was included in the audit form if permission was not granted to take photos so that the checklist could capture the contents of the vending machine.

Inter-rater reliability

Inter-rater reliability testing was carried out to test the reliability of the final audit tool developed. Ten centres, not included in the final sample, were visited within the Republic of Ireland and invited to take part in the research. Written permission was sought from participants before beginning data collection. Managers were present on-site in 3 centres and consented to participate in the study on the same day as the visit. The other 7 centres were subsequently contacted by UCD researchers after visiting in person. During the inter-rater reliability testing, two UCD nutrition researchers[3] visited the premises and completed the audit of the centre at the same time. The inter-rater reliability of the audit tool was found to be 82%, indicating good agreement between researchers.

Portion size measurement

The measurement of portion sizes within the audit was considered as part of the audit tool. An initial draft of the audit, containing tick-boxes for different size portions, was pilot-tested. This audit was carried out with 1 nutrition researcher and 1 fieldworker without a nutrition background. Following the pilot, it was found that the portion sizes were difficult to define, too subjective and did not give accurate results. Therefore, a simple 'yes, no or not available' checkbox for the presence of products was used and portion size detail was not included.

Data collection and processing

From April to June 2019, a total of 65 centres were audited using the final audit tool (Appendix II). An Audit Instruction Manual (Appendix I) was developed to assist the completion of the audit tool during data collection. Data was collected on hand-held mobile devices. Following data collection, the data from these devices were uploaded to a secure cloud-based management system and subsequently downloaded to Amárach Research's cloud-based secure server. Standard edit checks and quality control checks were

[3] Given the time frame it was not possible to request two of Amarach auditors to visit the same centre to do the inter-rater reliability and so it was conducted outside of the main field work.

conducted that included a review of photo images and fieldworker comments recorded word-for-word, to remove any personal information. The raw data file was then converted into an IBM® SPSS data file and password protected. Final data files were sent from Amárach Research to UCD in both Microsoft® Excel and IBM® SPSS format. Data analysis of results was conducted in SPSS Version 24.

Anonymity of data

It was agreed between Amárach Research and UCD that data collected from the auditing of centres would be anonymised before sending to UCD for data analysis due to concerns relating to data protection. Centres were categorised based on type of centre, deprivation index and urban or rural categories. Photographs from the audit were also anonymized but were not grouped according to these categories.

Use of photographic data

During the completion of the audit tool in centres, photographs were taken of beverages as instructed in the audit – 100% fruit juice, fruit juice drinks (with added sugar) and smoothies, to enable differentiation between different types of products. Products were described by brand, variety of product and volume (in millilitres) in the audit tool.

However, upon analysis of the 3 beverage variables including photograph results, it was difficult to differentiate and measure the presence of 100% fruit juices and fruit juice drinks. The quality of 73% of the photographs of these drinks was deemed to be sufficient; however, 27% could not be matched to centres, and did not have sufficient information to differentiate between fruit juices and fruit drinks. For this reason, in order to make a fair assessment of each centre, the photos of fruit juices and fruit juice drinks were excluded from the analysis.

Vending machine photographs

Photographs were also taken of vending machines within centres in which permission was granted to do so. Only 25% of photographs taken were of sufficient quality to carry out analysis. Issues presenting with photographs were that too much background lighting was present from within the vending machine to obtain accurate detail of the products within the machine, the photographs were out of range making it impossible to distinguish between products, incomplete photographs; and omission of shelves from the top or bottom of the photograph and so potentially missing data on products available on these shelves. For this reason, it was decided not to use photographs of vending machines and instead, to use the recorded audit data, indicating of the presence or absence of products within vending machines.

Recoded variables

The audit tool included slices and pieces of fruit and vegetables as two separate questions. For the purposes of the analysis these two questions were combined (recoded) into one variable. This measure was taken to prevent possible double counting of fruit and vegetables. In addition to recoding two fruit/ vegetable slices or pieces variables into one variable, other variables were recoded. Soup was recoded into one variable

describing any soup available in a centre – whether a centre shop, café or canteen. Soup was included in the "Meals" section when reporting the results. This was to ensure accurate reporting as this variable was included in the checklist for both shop and canteen. Recoding into one variable prevented double-counting. "Sausage rolls" were also present in the checklist in both centre shop/ café and canteen sections. Any sausage rolls present were recoded into one variable and included in the "Meals" section when reporting the results.

Additionally, "Salad as a main course" and "Salad bar" were two separate variables available in the "Meals" section when reporting results. Both variables were recoded into one single variable, describing the presence of either salad available as a main course or available within a salad bar in a centre. This measure was taken to prevent possible double counting of different types of salad options available in centres.

Audit scoring system

An audit scoring system was developed so that each centre would receive a score based on the 'healthfulness' of the food and beverages provided in their centre. The scoring system was based on the scoring system accompanying the "Nutrition Environment Measure Survey in Stores" (NEMS-S) (106). This scoring system was based on food availability, price and quality. For the purposes of this research, the most relevant of these was the food availability measure. The NEMS-S food availability scoring system is a positive scoring system, awarding positive scores when healthy options are available and awarding zero points when an unhealthy food is available (107).

As a result, the scoring system developed for this project was designed as a positive scoring system – if products present were of good nutritional quality (e.g. fresh fruit), they received one point. However, if products of lower nutritional quality (e.g. sugar-sweetened beverages) were available, they received no points. Therefore, audit scores would reflect higher scores based on greater numbers of nutritionally healthy food items available. Products deemed to be of good nutritional quality were based on Guidelines such as the *'Minimum nutrition standards for catering in health and social care'* (developed jointly by cross-border agencies) (108), *the 'Healthy Ireland Nutritional Standards for School Meals'* (110) and *the 'Healthy eating, food safety and food legislation: a guide supporting the Healthy Ireland Food Pyramid'* (111). The scoring system was developed by the research team and adjustments were discussed and made as necessary. The final scoring system is available in Appendix IV.

Two separate scores were developed to rank centres: a "Total Healthfulness Score" and a "Relative Healthfulness Score". The 'Total Healthfulness Score' was based on total points a centre received based on the number of healthy food or beverage items available. The 'Relative Healthfulness Score' was developed based on the 'Total Healthfulness Score' divided by the total number of food and beverage (healthful and less healthful) items available recorded on the audit form. Therefore, the 'Relative Healthfulness Score' is expressed as the total healthy products available as a percentage of total products available within a centre.

Calculating the Relative 'Healthfulness Score'

The Relative 'Healthfulness Score' was calculated based on the Total 'Healthfulness Score' as follows:

$$Relative\ 'Healthfulness\ Score' = \frac{Total\ 'Healthfulness\ Score'}{Total\ number\ of\ items\ present}\ X\ 100$$

The 'Relative Healthfulness Score' is expressed as healthful foods available as a percentage of total food and beverage items available. For example, a centre could provide a piece of fruit (1 point), chocolate bars (0 points), plain milk (1 point) and crisps (0 points). The Total Healthfulness Score would equal 2 points; the Relative Healthfulness Score would also equal 2 points (2 points divided by n = 4 products = 0.5, or 50%).

The 'Total Healthfulness Score' enabled comparison of centres based on total number of healthful foods or beverages available. The 'Relative Healthfulness Score' provided a fair method to compare centres, based on their total food and beverage offerings. For instance, centres scoring highly in the 'Total Healthfulness Score' could potentially score poorly in the 'Relative Healthfulness Score'. This scoring system enabled smaller centres that would typically have less food items available to be compared in a fair way to larger centres that generally have larger food offerings but may have a smaller proportion of healthy food items available.

Statistical analysis of scores

Statistical analysis was carried out using IBM® SPSS® Version 24. Scores were analysed for normality using the Kolmogorov-Smirnov test and were found to be non-normally distributed. The total and relative "healthfulness" scores were analysed based on median values. As a result, both scores were analysed using Kruskal-Wallis test of median ranks when measuring scoring differences between different centre characteristics.

Case studies with centre managers, parents and members of catering staff within children's social and activity centres

Rationale for case study approach

Using both quantitative and qualitative research methods enables an integrated approach to understand a phenomenon such as the food environment within children's social spaces, where one method used on its own does not provide sufficient insight (112). A qualitative case study approach allows phenomena to be explored using a variety of data sources, enabling the phenomenon to be considered from many different viewpoints to gain greater insight (113). For this reason, key stakeholders involved in food choice and food provision were invited to take part in the case study interviews as part of the understanding of the food environment within children's social spaces. Key stakeholders identified were managers of social and activity centres, parents of children attending centres regularly and members of staff serving food at these spaces.

A key aim of the case studies was to develop suggestions for ways to improve the food environment within social spaces. As a result, parents were recruited to suggest methods to encourage healthier eating in children's social spaces

Piloting interview topic guide

Case study interview topic guides for centre managers, parents and members of catering staff were developed by the project collaborators. The initial topic guides was informed by a scoping review of the literature about food choice within social spaces for children, especially in regards school meals and eating outside of the home. This was supplemented for the catering staff and managers by focusing the review on previous work that interviewed catering staff and managers, predominantly within the school setting. This scoping work was further refined and redrafted through a series of meetings with the project collaborators. Catering managers, catering staff and parents within the university that had extensive everyday contact with children and parents were recruited to pilot-test the interview topic guide. Pilot interviews were recorded using dictaphones. Once pilot interviews were complete, the topic guide indicated that the questions were clear to understand and sufficiently open to elicit responses, therefore no adjustments were required. The final version of the case study interview topic guide is available in Appendix IV.

Participant recruitment

While conducting the fieldwork for the audit, Amárach Research recruited participants for case study interviews within the Republic of Ireland and Northern Ireland from August 2019 to November 2019. In total, 8 centres were contacted but two centres declined to participate. Participants were recruited from 6 centres across the island of Ireland – 3 centres in Republic of Ireland and 3 in Northern Ireland. From the results of the audit, centres were ranked according to their 'Healthfulness' Score. A variety of high-, medium- and low-scoring centres were recruited. Furthermore, different types of centres were represented, in terms of

deprivation index and publicly or privately-run centres. Additionally, it was ensured that centres recruited had a wide range of food provision such as the provision of meals in addition to snacks and beverages through vending machines.

Amárach Research sought permission from centres to recruit participants from within their centres and then to invite staff from these centres to take part in individual interviews. Three case study participants were recruited from each centre – the centre manager, a member of the catering staff and a parent of a child who attended the centre regularly. Interviews were held on the premises of the centres to optimise recall of each participant's experiences.

Once participants were recruited, arrangements were made to conduct the interview at a time that was convenient to them. Interviews were conducted during August and September 2019. Prior to the interview, participants were provided with information about the study and were given time to consider their participation and ask any questions they had about the research. Written consent was sought from participants before commencing interviews. Interviews lasted approximately 10 to 30 minutes and were audio-recorded. All interviewees were encouraged to suggest strategies to support children in healthy eating within children's social spaces. Each interview was undertaken one-to-one by the research assistant with each case study participant. Interviews were recorded on recording devices (*Model*: Olympus® VN 540 PC dictaphone).

Participants received a £45/ €50 honorarium to compensate for any costs incurred from taking part in the interviews. Fifteen interviews were conducted, transcribed and analysed.

Case study interview transcription

Following case study interviews, recordings were transferred from recording devices onto password-protected encrypted personal computers and deleted from recording devices.

Focus group discussions with parents whose children visit children's social and activity centres regularly

Qualitative focus group discussions were held with parents of children who attend different types of children's social and activity centres regularly. The aims of the focus groups were to further understand families' experiences of food choice within children's social spaces and to test strategies that had been suggested by key stakeholders within case study interviews.

A total of 4 focus groups were held across the island of Ireland – Dublin, Cork, Belfast and Derry/ Londonderry.

Focus group discussion topic guide development

Both the literature review and themes identified from the case study interviews informed the development of the focus group discussion topic guide and vignettes used during the focus groups. Vignettes (scenarios used to demonstrate or describe a situation) were designed to enable participants to speak about sensitive topics more easily. The topic guide (Appendix VI) was piloted within staff members from UCD and QUB who are parents who had been to a children's social space within the last 3 months during September 2019 before holding focus groups to enable further refinement.

Participant recruitment

Focus group participants were recruited from within children's social and activity centres by Amárach fieldworkers. Amárach Research were given permission from the centre managers to recruit their customers. The field workers approached individuals attending the centre to invite them to participate in the study. Amárach Research designed a recruitment screening questionnaire to ensure recruited participants provided a good representation of age, socio-demographic and other factors within each focus group.

Focus group participant criteria were as follows:

- Parents attend centres at least twice per month with their children
- Food or drink is purchased when visiting centres
- Participants' children do not have any food allergies (as this would impact on food choice in centres)
- Participants' children are a mix of ages and genders
- Participants are a mix of ages, genders and social class.

Focus group venues

Focus groups took place in hotels in each of the regions where the centres were located as set out in sampling design. Two researchers were present in each focus group to facilitate discussion. Research assistants associated with the project (BM and NS) moderated the focus groups within their respective jurisdictions (NI or ROI) and researchers assisting focus groups were experienced colleagues based in University College Dublin or Queen's University Belfast. Researchers assisting with focus groups,

assisted with the collection of consent forms, monitored time given to all questions and took notes of any non-verbal cues relevant to the discussion. Moderators facilitated the discussion within focus groups.

In each focus group, n = 8 participants attended. Participants received an honorarium of £45/€50 in the form of an One4All gift voucher to compensate for time lost or expenses incurred as a result of attending the focus group.

Focus group transcription

Once focus groups were completed, audio-files were transferred from audio-recorders to password-protected encrypted PCs and deleted from audio-recorders. Focus groups were transcribed by the transcription company.

Analysis for case studies and focus groups

Inductive thematic analysis was chosen as it is considered to be flexible yet structured in terms of accommodating theoretical perspectives, highlighting commonalities and differences in a data set and generating insights (114, 115). By using inductive thematic analysis, the analysts were able to compare the themes developed from both the manager and staff focus case studies and the parent focus groups and case studies. Within this study, thematic analysis allowed the research to develop themes in response to broad patterns; which can be further developed in later work. The lack of theory or previous research in children's social spaces and food choice meant an inductive methodology linked to the data was appropriate (114, 116).

Combination of the results

In this study, a multimethod approach to data collection was used. Using a multi-method monostand design (combining focus groups and case studies) promoted a more complete method of dealing with the richness of the real world (117). A critical review endorsed this integration of the methods as it *"leads to an enhanced description of the phenomenon's structure and its essential characteristics"* (118). Theme development and effectiveness are similar between the methods (118, 119).

5 Results

The data were collected from the 3 phases of this study

1. Audit of food and beverage provision within children's social and activity centres
2. Case study interviews with key stakeholders in children's social and activity centres
3. Qualitative focus group discussions with parents of children attending social and activity centres regularly, investigating families' experiences of food choice in these spaces.

Audit of food and beverage provision in children's social and activity centres

The types of centres audited ranged from community play centres to public sports centres. Upon analysis of data, a total of 64 centres were considered to fit the definition of "children's social spaces" (as defined in the introduction to Section 3, Research methods, in this publication).).

Types of centres audited

The types of centres audited were children's play centres (40.6%), sports centres (48.4%) and community centres (10.9%). A total of 65 centres were surveyed. One centre visited was reported by a fieldworker to provide food but noted that it was a "pre-school" centre. This venue was excluded on the basis that it was not considered to fall under the true definition of a children's social space. Therefore, data were analysed from 64 centres across the island of Ireland. The sample characteristics of the centres are listed in Table 11 and indicate that the size and the deprivation index of centres in both Northern Ireland and the Republic of Ireland were broadly distributed. There was also a good representation of privately-owned (59.4%) and public (40.6%) centres. The majority of centres (81.3%) were located in urban areas, as is typical for such centres.

Table 11: Sample characteristics of social space centres audited on the island of Ireland

Types of centres (n 64)	Number of Centres (n)	Percentage of Centres (%)
Types of centres	n = 64	
Children's play centres	26	40.6
Sports centres	31	48.4
Community centres	7	10.9
Number of seats available in seating area	n = 64	
0	11	17.2
1-100	47	73.4
101-200	5	7.8
201-300	1	1.6
Population demographics	n = 64	
Urban	52	81.3
Rural	11	17.2
Mixed urban/ rural	1	1.6

Deprivation Index	n = 64	
Northern Ireland (n = 19)		
Less affluent (Categories 1-5)	14	21.9
More affluent (Categories 6-10)	5	7.8
Republic of Ireland (n = 45)		
More affluent	22	34.4
Less affluent	23	35.9
Public/ private centre	n = 64	
Privately-owned centre	38	59.4
Public centre	26	40.6

Food and beverage provision in children's social and activity centres

The audit tool took account of 3 types of food and beverage provision within children's social spaces:

- Beverages and snacks that were not purchased from vending machines
- Meals
- Vending machines.

All centres had at least 1 method of food provision available. The availability of different types of food are described using these categories.

Beverages and snacks that were not purchased from vending machines.

Centres typically had shops or cafes from which snacks and beverage could be purchased. This type of food provision also included community centres where parents pay a small fee to attend a play/activity session with their child and food is provided but not purchased in the same way as in a shop (n = 45 centres). While diet soft drinks and sugar-sweetened soft drinks were the most common offering (82% and 80% respectively), there was similar availability of plain bottled water. Plain milk was also available in many of the centres (68.9%) (See Table 12).

Table 12: Beverages available to purchase at shops and cafés in a sample of social and activity centres for children on the island of Ireland

Beverages Available in Centre Shops and Cafés	Available (n)	Available (%)
Total centres	**45**	
Diet soft drinks	37	82.2
Plain bottled water	36	80.0
Sugar-sweetened soft drinks	36	80.0
Juice-type drinks	33	73.3
Plain milk	31	68.9
Dilutable squash or cordial	30	66.7
Sparkling water	29	64.4
Sports drinks	18	40.0

Dairy-free milk drinks	12	26.7
	10	
Smoothies	7	15.6
Flavoured milk with added sugar	7	15.6
Energy drinks	6	13.3
Protein milk	3	6.7

In terms of snack provision, chocolate bars were the most commonly available (82.2%), followed by crisps (73.3%) and baked goods, such as croissants and muffins (57.8%) (see Table 13). Fruit/ vegetable slices or pieces were available in 55.6% of centres providing snacks (not through vending machines).

Table 13: Snacks available to purchase at shops and cafés in a sample of social spaces for children on the island of Ireland

Snacks Available in Centre Shops and Cafés	Available (n)	Available (%)
Total centres	**45**	
Chocolate bars	37	82.2
Crisps	33	73.3
Croissants/ muffins/ cupcakes/ brownies/ cake/ tart slice/ scone	26	57.8
Fruit/ veg slices or pieces	25	55.6
Cookies	23	51.1
Protein bars/ meal replacer bars/ flapjacks/ cereal bars	20	44.4
Jelly sweets	19	42.2
Yoghurt	11	24.4
Popcorn	8	17.8
Plain rice cakes	8	17.8
Dried fruit/ nuts	6	13.3
Cheese & crackers	5	11.1
Plain roasted nuts	4	8.9

Meal provision

Some centres provided meals such as lunch or dinner items i.e. not just snacks, with larger centres typically having canteens or restaurants on-site (n = 38 centres). The list of meal items included a range of hot or cold options. Sandwiches or wraps were the most commonly available meal items (71.1%), followed by cheese toasties (63.2%), chips (60.5%) and chicken nuggets or goujons (60.5%) (see Table 14). While there was a broad range of foods included in the audit. Certain meal items, such as nachos or chicken curry, were not readily available. However, almost 30% of the centres had vegetables and soup available.

Table 14: Meals available to purchase in venue canteens and restaurants in a sample of social and activity centres for children on the island of Ireland

Meals Available in Centre Canteens and Restaurants	Available (n)	Available (%)
Total centres	**38**	
Sandwiches/ wraps	27	71.1
Cheese toasties	24	63.2
Chicken goujons/ nuggets	23	60.5
Chips	23	60.5
Cocktail sausages	22	57.9
Ice-cream	19	50.0
Cakes/ tarts	19	50.0
Burgers	18	47.4
Baked beans	18	47.4
Paninis	18	47.4
Pizza	14	36.8
Spaghetti/ pasta dishes	14	36.8
Salad as a main course or salad bar	14	36.8
Scrambled eggs (with/ without toast)	12	31.6
Vegetables	11	29.0
Soup	11	29.0
Sausage rolls	8	21.1
Potato wedges	7	18.4
Chicken curry with rice	5	13.2
Chicken fillet rolls with/ without curry sauce	4	10.5
Fruit-based dessert	4	10.5
Nachos	1	2.6

Vending machines

Vending machines were found in 35 (55%) centres and contained beverages and snacks. Unflavoured bottled water was the most commonly available beverage in vending machines (88.6%), closely followed by sugar-sweetened soft drinks (85.7%) and diet soft drinks (80.0%) (see Table 15).

Energy and sports drinks were found to be more readily available in vending machines (80% and 49% respectively) compared to cafes and shops, only 40% of which provided sports drinks and 13% provided energy drinks (see Table 12).

Snack items in vending machines had similar availability of product types to the café/shops. Chocolate bars were the most common item available (71.4%), followed by crisps (68.6%). Baked goods were not

available in vending machines. Products that did feature frequently were protein bars, meal replacer bars, flapjacks or cereal bars which were available in 54% of vending machines (see Table 16).

Table 15: Beverages available for purchase from vending machines in a sample of social and activity centres for children on the island of Ireland

Beverages Available in Centre Vending Machines	Available (n)	Available (%)
Total centres	**35**	
Plain bottled water	31	88.6
Sugar-sweetened soft drinks	30	85.7
Diet soft drinks	28	80.0
Sports drinks	28	80.0
Energy drinks	17	48.6
Flavoured still water	13	37.1
Sparkling water	12	34.3
Juice-type drink	10	28.6
Protein milk	7	20.0
Flavoured milk with added sugar	6	17.1
Dilutable squash/ cordial	3	8.6
Smoothies	0	0.0
Plain milk	0	0.0
Dairy-free milk drinks	0	0.0

Table 16: Snacks available for purchase in vending machines in a sample of social and activity centres for children on the island of Ireland

Snacks Available in Centre Vending Machines	Available (n)	Available (%)
Total centres	**35**	
Chocolate bars	25	71.4
Crisps	24	68.6
Protein bars, meal replacer bars, flapjacks or cereal bars	19	54.3
Jelly sweets	17	48.6
Croissants, muffins, cupcakes, brownies, cake, tart slice or scones	10	28.6
Cookies	7	20.0
Popcorn	6	17.1
Plain roasted nuts	6	17.1
Dried fruit or nuts	5	14.3
Plain rice cakes	4	11.4
Fruit or vegetable slices or pieces	3	8.6
Sausage rolls	1	2.9
Yoghurt	0	0.0
Cheese and crackers	0	0.0

Food environment information

Information on the food environment, such as children's meals, catering policies and practices within centres, is presented in Table 17. Of the centres providing meals (n = 38), 50% provided children's meals and approximately one-third (34.2%) provided half-adult portions as meal options. Of the centres providing children's meals (n = 19), almost all centres (94.7%) provided options of unflavoured plain milk or water with meals. Marketing of foods using toys or child-orientated packaging was not prevalent in the centres that offered children's meals.

Table 17: Children's meals available for purchase in in a sample of social and activity centres for children on the island of Ireland

Children s Meals Available in Centres	n	Available (n)	Available (%)
Total number of centres	38		
No. of centres providing children's meals available	38*	19	50.0
- Unflavoured plain milk or water offered with children's meals[a]	19**	14	73.7
- Unflavoured plain milk or water available with children's meals on request[b]	19**	18	94.7
- Fruit, vegetables, salad or yoghurt offered as side options with children's meals[a]	19**	8	42.1
- Fruit, vegetables, salad or yoghurt offered as side options with children's meals when requested[b]	19**	11	57.9
Are half adult portions available as an option for meals for children?	38*	13	34.2
Children's meals offered in food packaging with colourful designs/ cartoon characters	19**	2	10.5
Toys offered with children's meals	19**	1	5.3

*= number of centres providing meals

**= number of centres providing children's meals

[a]= number of centres providing these options with children's meal as standard (not as a special request)

[b]= number of centres providing these options with children's meals upon request

In terms of marketing and promotions, just over a quarter of the centres provided meal offers, such as a free drink, and these were typically promoted on the menu boards at the till or cash register (see Table 18). Only 28% of the 64 centres provided party bags, but most of these did contain food items.

There was limited promotion of healthy eating across all centres as evidence by the lack of any visible posters or leaflets. Branding or advertising was reported on 64% of vending machines, 57% of which was

to promote unhealthy snacks or beverages. Just under 9% of vending machines included messages that promoted health foods.

Table 18: Promotional activities in a sample of social and activity centres for children on the island of Ireland

Marketing or promotional activities within children s social spaces	n	Available (n)	Available (%)
Total number of centres	**64**		
Centres providing party bags for children to bring home	64	18	28.1
- Party bags containing food items	18[a]	13	72.2
Meals providing vouchers (e.g. money off next visit) when purchased	38[b]	1	2.6
Visibility of promotional offers on meals within centres	38	10	26.3
Types of visible promotional offers for meals within centres:			
1. Free soft drink with every meal purchased	10[c]	6	60.0
2. Meal offer (e.g. €5 for chips & drink)	10	6	60.0
Locations where menu promotions are visible in centres:			
1. Menu board at tills	10	9	90.0
2. Promotional material on tables	10	5	50.0
3. Posters	10	5	50.0
4. Leaflets	10	4	40.0
5. Hanging cards	10	2	20.0
6. Tray covers	10	1	10.0
Presence of healthy eating promotional materials in centres	64	9	14.1
Types of healthy eating promotional materials available:			
1. Leaflets	9[d]	4	44.4
2. Posters	9	3	33.3
3. Hanging cards	9	1	11.1
Any branding or advertising visible on any vending machines?	35[e]	23	64
Any messages promoting healthy foods on any vending machines or nearby location or on packaging of food in vending machines?	35	3	8.6

[a]n = number of centres providing party bags to bring home

[b]n = number of centres providing meals

[c]n = number of centres where promotional offers on meals are visible

[d]n = number of centres where healthy eating promotional materials are visible

[e]n = numbers of centres containing vending machines

Healthier options were available in some centres, such as a brown or whole grain bread option for sandwiches (63.7%) and low-fat versions of spreads (42%) (see Table 19). Catering policies in relation to salt removal or reduction were limited. Calorie information was available at the point of choice (on till boards or menus) within a very small number of centres (5%) and, similarly, there was limited availability of ingredient information in centres (22%). Water was not freely available at all times in 28% of all centres (see Table 19).

Table 19: Nutritional policies and catering practices in a sample of social and activity centres for children on the island of Ireland

Nutritional policies and catering practices	Number of Centres (n)	Available (n)	Available (%)
Total number of centres	**64**		
Is free drinking water available to customers at all times?	64	46	71.9
Are brown bread/ wholegrain versions of breads/ wraps available for sandwiches on request?	38**	24	63.2
If spreads (e.g. butter) are available, are low-fat versions also available?	48*	20	41.7
Are customers permitted to bring food from outside and use seating within the centre?	64	19	29.7
Are ingredients clearly displayed?	64	14	21.9
Is sugar/ salt available on eating tables?	64	10	15.6
Are facilities provided for customers to prepare their own food? (e.g. microwave)	64	9	14.1
Is calorie information displayed clearly at point of choice?	64	3	4.7
Is salt added to chips/ wedges etc. before serving?	38**	1	2.6

*** =** number of centres providing meals or snacks/ beverages (not vending machines)

** = number of centres providing meals

Audit scoring system – 'Healthfulness Score'

Total and Relative Healthfulness Scores were calculated for each centre. The higher scores indicated better healthfulness of the food environment in the centre. Absolute scores could range from 0 to 45 (range = 0 to 25 within this sample of centres) and relative scores ranged from 0 to 100% (Table 20).

The Total Healthfulness Scores differed significantly across centre type. Children's play centres had the highest score and community centres, the lowest score. The urban or rural centres also showed significant differences between centre scores, as did the type of management within a centre i.e. public centre or privately-owned centre (see Table 20).

However, once the score was adjusted to the Relative Score, it was clear that high scores were simply a function of a greater number of items being available.

Table 20: Differences in Total and Relative 'Healthfulness Scores' across different centre characteristics

Variable		Total 'Healthfulness Score		Relative 'Healthfulness Score	
Variable	**n**	Median (IQR)	p-Value*	Median (%) (IQR (%))	p-Value*
Types of centres	**64**				
Children's play centres	26	9.00 (5.00-14.00)		46.0% (41.0-53.9%)	
Sports centres	31	4.00 (3.00-16.00)	**0.005**	48.0% (35.0-55.0%)	0.124
Community centres	7	3.00 (2.00-4.00)		66.7% (44.4-100%)	
Deprivation Index	**64**				
Low deprivation index	37	5.00 (2.50-12.50)	0.164	45.0% (35.7-53.9%)	0.097
High deprivation index	27	7.00 (4.00-14.00)		50.0% (42.9-55.6%)	
Urban/ rural	**63****				
Urban	52	6.50 (3.25-14.00)	**0.035**	48.2% (37.9-53.9%)	0.971
Rural	11	4.00 (2.00-9.00)		47.4% (36.4-66.7%)	
Type of centre	**64**				
Public centre***	26	4 (2-6.75)	**0.007**	50.0% (35.6-60.4%)	0.556
Privately-owned centre	38	9 (5-14)		46.8% (40.0-53.9%)	

Abbreviations: n, sample size; IQR, interquartile range; p-value, probability value

* Significance was tested using the Kruskal-Wallis test of mean ranks as the total 'Healthfulness Score' variable was non-parametric; α was set at 0.05 significance

** One centre was mixed urban/ rural and was excluded from this analysis

*** Public centres were those that were fully or partially funded by government/local councils.

Case study interviews with key stakeholders within children's social and activity centres

In total, 6 centre managers and 6 staff members were interviewed in 6 centres across the island of Ireland. A total of 6 parents (3 in ROI; 3 in NI) were interviewed for the case studies; however, the parents' results from the case studies were analysed together with the focus group results.

When analysing the data, the themes that developed from the parent perspectives (both case studies and focus groups) had similar theoretical and practical construction; while the manager and catering staff themes that developed were theoretically and practically different perspectives on the role of food choice within social spaces. The use of 6 case study interviews with parents would not provide sufficient weight to base recommendations on; therefore, combining parents' case study interviews and focus groups was deemed as improving the rigour and credibility of the research paradigm.

From the analysis, 3 major themes from staff and centre manages were developed and identified as important in food and beverage provision within children's activity and social centres;

- Decision-making based on choice and consumer demand
- Business interest in healthy food promotion
- Challenges and opportunities to improve food choices.

Decision-making based on consumer demand

Decision-making varied based on business size; with franchise businesses reporting minimal influence over decisions of what to offer consumers, while independent businesses described greater flexibility and desire to provide healthy options for children. Overall, businesses reported a trend towards consumers wanting healthier options; especially those endorsed by celebrity chefs (such as Jamie Oliver and Rachael Allen), who were highlighted as significant influencers on purchasing habits. As a result, some businesses had included protein-based alternatives (such as protein bars) as a "healthy option", however this was not solely child-focused. Overall, businesses focused on supplying quick and convenient food to children rather than providing healthier options.

> "We have tried to push the healthy eating and stuff but it just doesn't…they don't want it." **Manager**

> "It's very difficult because the kids still like their crisps and [named crisp snacks] and stuff, but just to have them as part of it…a wide variety. Variety is the key" **Staff**

Business interest in healthy food promotion

Overall, businesses focused on their operational activities rather than healthy food promotion, with many businesses focused on the role of schools as actors for change, rather than their organisation. The managers and staff believed their role was to provide physical activity opportunities as part of health, rather than through the food choice available.

However, some of the centres recognised their role as influencers to children and had enacted policies to reduce the negative aspects of these centres, such as banning the use of energy drinks by staff in view of children. However, this was described by the managers as policies which they felt were important to promote healthier living amongst the impressionable children that frequented their establishments, rather than having a specific focus on the food choice available to these children. The removal of the worst examples of nutritionally deficient food was described in one recreational area, but they still stocked multiple chocolate bars and crisps to fulfil customer demand.

> "We promote the activity, and if people enjoy doing that, I think the health will come off it." **Manager**

> "So, especially in a health centre, people do want healthy things." **Staff**

Challenges of providing healthier foods

Centre managers and staff identified that there were inherent challenges in providing healthier food; maintaining fresh food and competition but identified opportunities to develop the healthfulness of their menus.

Managers reported difficulties in keeping fresh food, especially in smaller centres where turnover was lower. Competition from fast-food outlets, was highlighted as a barrier in providing healthier options as children and parents would rather eat there than in-centre.

Some businesses highlighted opportunities to improve the healthfulness of their offerings when renegotiating outside catering and provision contracts. This involved incorporating healthier or higher-quality ingredients, utilising healthier cooking methods (oven-baked compared with fried) and updating the menu to include healthier options.

Most of the businesses visited were not equipped to deal with larger groups, such as children's parties, and outsourced their catering (or it was provided by parents).

> "But I think with the arrangement that was in place and the contract that was in place, it's not always easy to influence a lot of companies' operations, I'd say. However, prior to agreeing a new contract things like that will have to be written in and agreed upon." **Manager**

> "We wouldn't sell something that we felt was intrinsically bad for people, but people's health is largely up to them. As a business, we are not in a position to dictate to people what they should or shouldn't eat, and I don't think people would take it very well if we did do that." **Manager**

> "No, healthy food is cheaper, chicken goujons are expensive. Breast chicken is a lot cheaper. Healthy foods are definitely cheaper. So, it wouldn't be a cost issue. Possibly a timing issue, change of menus around and stuff, but definitely not cost, it wouldn't be down to cost. But yes, we look at doing that. We were speaking about it already" **Staff**

> "We had really tried to push the sort of healthy eating the last 4 or 5 years. We've been given quite a lot of literature about healthy eating and how to promote it in schools so obviously this, we see this as extension of a school, it's a centre for learning, but it's still that sort of environment whenever the young people come here from their school" **Manager**

Focus groups discussions with parents of children attending children's social and activity centres regularly

In total, 38 parents (29 females and 9 males) (6 case study interviews and 32 parents involved in focus group discussions) from across the island of Ireland were involved in the discussion of food choice in children's social and activity. All parents attended these spaces for regular sporting activities (such as swimming), parties or to get the children out of the home for either physical activity or to have a break in their normal routine (in the home) at the weekend. As described within the methods, the focus group and case study responses from parents were analysed together due to the similar theme development structures within both methods when conducting thematic analysis and similar main themes that developed from the analysis.

From the analysis, 3 major themes were identified:

- Food choices
- How to influence healthy eating
- Reactions to common food scenarios with children.

Food choices

In general, parents were disappointed with the food choice available in social and activity centres, with a lot of the options viewed as "*greasy*", poor quality and over-priced. This was similarly found in the vending machines and confectionery sellers, where "value-pack" and adult-sized bars and crisps were on sale, rather than child-sized servings. The most common options reported as available were chips, pizzas, burgers, chicken nuggets, sausages or *"deep-fried food".*

Businesses where healthier options were available, such as salads, fresh sandwiches, spaghetti and cottage pie, were praised as substantial choices for children. Small changes such as oven-baked foods (rather than deep-fried or unhealthily cooked foods, especially chips and pizzas) were heralded as a positive step and were noticed by parents.

Overall, parents wanted the option of healthier meals to be available; and at the very least, healthier cooking methods to be utilised. When these options are not provided, many would not buy food in-centre and chose other eateries or to cook at home.

> "Well, it's normally chicken nuggets, chips on plastic plates, and sausages and chips and things like that. It's just the same as anywhere else." **Parent**

> "So, there's no fresh vegetables at these places and you can't ask for potatoes and broccoli and carrots and chicken nuggets." **Parent**

> "In some of the play centres we go to, they do, like, oven-baked chips as opposed to deep-fried chips. So, I like to use that if we are eating it. Just, you're trying to teach the kids about health and then you're letting them to get chips. It nullifies all the work you do in the pool or whatever." **Parent**

> "All they have for the children is those big pound bags of crisps! All big bars of chocolate and – that's all their selection is, I think that's unreal! I just think its big bags of stuff!" **Parent**

> "I tend to not buy food when I'm out in places like that cos I don't think the quality's very good. And it's just over-priced cheap rubbish so I will say to them [children], 'No, we'll get something on the way home'." **Parent**

> "Its very contradictory, I feel for, you know, for them to be all promoting things on TV and then again about getting out walking and being fit and healthy but yet they're not prepared to provide you with a healthier option. To me it's pointless; what's the point in going swimming or going to the gym if you're just going to go and get a burger on the way home? To me it doesn't make any sense. " **Parent**

How to influence healthy eating

Parents had some innovative ideas on how to influence healthier eating in these social and activity centres; many of which targeted children (and themselves) to choose healthier options.

Parents had a number of easy-to-introduce ideas that could encourage healthier eating. For parents, the introduction of reward cards for choosing healthy options and family play-and-eat deals were supported. This would make their choice easier and many parents were receptive to the idea that choosing healthier options would be beneficial for their children and for the bank balance (through incentives). On these choices, some parents perceived the idea of a "children's menu" as being out-dated, as modern children were more varied eaters than previous generations and often desired smaller portions of adult meals. These types of changes could help promote an improved version of recreational centre eating that is closer to the idealised vision described by the parents in the study.

Parents also supported different types of offerings at these locations, such as introducing small picnic baskets and "pick-your-own" delicatessens which were predominantly healthy and would have the additional benefit of empowering children to make their own choices and encouraging healthy options through their own (children's) choice. However, these types of options were not commonly available in recreational centres for children.

On advertising, parents identified the multiple influences on children's food choice. Some of the main advertising/promotion techniques identified by parents were how brightly coloured advertising, 'free toys' and the placement of products influenced their children's preferences and food choices. An example of this was how the smell of hot food. Parents identified that unhealthy options were usually the ones that were prompted using these techniques rather than healthier options and found it difficult to encourage healthier options to their children when faced with these obstacles. Parents felt better advertising of healthy options, free toys and having the healthier options more obvious (at eye level, front of house and unhealthier options less prominent) would encourage healthier choices.

Similarly, introducing small picnic baskets and pick-your-own delis were also supported as empowering children to make their own choices and encouraging healthy options through choice.

Parents reported that there were multiple influences on children's food choice. Children were heavily influenced by brightly coloured advertising, 'free toys' and the placement of products, including the smell of hot food. Parents felt better advertising of healthy options, free toys and having the healthier

options more obvious (at eye level, front of house and unhealthier options less prominent) would encourage healthier choices.

> "I'd try and create fun menu advising. I would like to see it, yes. You don't tend to see it in an awful lot of places." **Parent**

> "I suppose, well, it's this thing - if you go in somewhere and all you can smell is like hot chips, then immediately that's kind of what you want. So, I think I suppose what other people are eating, as well, really influences them; so if they see everybody eating like hot chips or a burger or whatever then that's kind of what you want." **Parent**

> "I'm a great believer in advertising, and like pictures up of healthy options or healthier options and yeah, so, I think that's quite a good idea and special offers. Certainly, like, any kind of special offer where you get money off, you know, you get a pound off whatever if you buy, like, a whole meal deal thing, I think that's probably that would influence me." **Parent**

Reactions to common food scenarios with children

Three vignettes, or scenarios were presented (Appendix VI) that focused on potential situations that may happen with parents and children in social areas.

The first scenario focused on 2 mothers, where one young boy had a homemade sandwich, while his friend bought chips. Two schools of thought emerged, with some parents buying chips for their child; to avoid appearing "mean" or "tight" to other parents and to avoid a child's tantrum. Other parents favoured compromise, with the child eating the sandwich and then perhaps getting a treat or the chips or sharing the chips. This scenario highlighted that parents were influenced by how other parents behaved in this scenario and wanted to avoid conflict with their children.

> "I think parents as well are afraid of being looked upon...that doesn't make them not a good parent." **Parent**

> "...the meltdown..." **Parent interactions**

> "She didn't because if she actually went to the bother of making a sandwich and bringing an apple, she's that type of mammy; fair play, she didn't give it to him."

> "...but the sulky child!" **Parent Interactions**

The second scenario focused on a mother having the choice of buying a more expensive "healthy option" or the cheaper "normal option" of chips and chicken nuggets. Most parents would go for the cheaper option; to reduce costs and as the child was more likely to eat it. This corresponded to the general consensus that parents, especially with larger families, were anxious to reduce costs where possible but the focus was on the child eating something rather than on what was eaten. Parents who were very health focused or whose children were "fussy eaters" were more likely to disregard the price or leave the centre for better food options.

> "You're not in a 5-star restaurant...you know, you're in, like...sorry an [indoor play] area or whatever. All you want to do is play, eat and get out and you know they're gonna eat. There's

> nothing more frustrating than when you get them something and pay for it and they don't eat it." **Parent**

The final scenario focused on choice of restaurant on a day trip for a father and daughter. For these trips, parents were less concerned about prices and focused on a positive experience for the child, both in the activities and spending time together with food. Healthy eating was not a main priority for many parents on trips (especially outside regular scheduled activities), viewing them as "treats".

> "To be honest, see, if I'm in one of those places, it's a treat for the child. They eat well during the week and stuff, you know; I don't mind getting a [named fast-food burger] or getting them [named fast-food burger or fried chicken] at the weekend because they've ate well all week, and that's a treat. It's the weekend, do you know what I mean, so it's not really that it's an everyday event, so I don't mind getting them whatever it is they want when they play, know what I mean?" **Parent**

Overall, the results of the parent interviews and focus groups discussion indicated parents wanted healthier choices to be available, healthy food should be incentivised and that healthier practices should be involved when cooking food.

6 Discussion and key findings

Food and beverages available within children's social spaces

Previous studies of the food environment within children's social spaces indicated that food and beverages sold in environments where children play and socialise were predominantly HFSS foods and SSBs (12-14, 40-45). This was also found in this study where SSBs and unhealthy snacks were readily available.

One finding of interest not described in the existing literature was the high proportion of centres that provided milk as an option.

Fruit or vegetables slices or pieces were available in a considerable number of centres providing snacks which was positive. This finding was broadly comparable to the research by Nowak and colleagues, who found that fruit or vegetables were available in 42% of centres based in London boroughs (14). The differences noted in fruit and vegetable availability across types of centres may be because community centres are under the remit of state agencies and therefore, are likely to be more aware of and may choose to align themselves with recommendations such as healthy eating guidelines.

Vending machines were shown to provide predominantly foods or beverages that were not considered to be healthy. Since most of these machines were found in sports centres, they were found to have higher proportions of sports and energy drinks and protein bars compared to the other types of centres. This finding was not previously reported in the literature; however, some of these products may not have been available during the time of previous research. The prevalence of these products in sports centres is likely because they are perceived to be healthy; they may in fact be higher in fat, sugar and salt than other beverage and snack products.

The variation in types of centres and the manner in which food was provided (for example, cold options or hot meals) made it difficult to make direct comparisons across all the centres. Evidently, centres with more food options have a greater opportunity to introduce healthier choices. Nevertheless, the results do suggest that some centres had already introduced small changes including providing brown or wholegrain bread and low-fat spread options to their customers.

Whilst the Total 'Healthfulness' Score is a useful measure to compare centres, larger centres would typically receive higher scores than smaller centres, which may not accurately reflect the healthfulness of food offerings in centres. Community centres generally provided small numbers of food options; however, these options were considerably more healthy and received maximum points possible. The reasons for this are not fully clear but it is possible that the community centres are not placed under the same pressures as the commercial centres to increase profits resulting from food purchases. The Relative

Healthfulness scoring system can provide greater insight into relative healthfulness of centres and the potential inequities that are present as a result of the varied nature of this sector. The scoring system has the potential to highlight meaningful change to food environments and could be used to monitor progress.

Parents' and children's eating and food choice practice within children's social spaces

Parents perceived food offered within children's social spaces to be generally unhealthy and indicated disappointment at the limited healthy food options. This observation was similar to the findings of Thomas and Irwin (55), and Caswell and Hanning (56), where parents wanted healthier options to be available. One finding of interest was that parents wanted healthier cooking methods to be used as a bare minimum. In centres where healthier options were not provided parents chose to leave centres, which was also reported by the adolescent subjects in the study by Caswell and Hanning (56). Others chose to patronise other food venues or to eat at home.

Cost was identified by parents as one of the main determinants of food choice, with most parents selecting the cheaper options. Food waste was also highlighted as a factor in food choice, with the focus being on the child eating something rather than on what was eaten. Both of these factors were also observed in the research conducted by McGuffin and colleagues (30) and Thomas and colleagues (55).

Additional factors that can influence food choice or practice in these centres related to avoidance of conflict, and if the child was a "fussy eater". A further similarity to this research conducted by McGuffin and colleagues (30) and Thomas and colleagues (55) was that visits to centres that were outside usual routine were considered to be "treats", with a positive experience for the child being the most important factor and price and healthy eating of less concern.

Parents considered that better advertising of healthy options, such as free toys or having the healthier options more obvious (at eye level or unhealthier options in less prominent locations) would encourage healthier choices.

Barriers to and facilitators of healthy eating within children's social spaces

The interviews with social activity and centre managers and members of catering staff highlighted different challenges, perceptions and motivators in the provision of healthy food offerings. These findings were broadly in line with the research described in the literature review. There was a perceived lack of control over the nutritional quality of food offerings, particularly in the larger centres where the food was provided by a franchise. There was an acknowledgement that some consumers desired healthier options but many businesses reported that this was not one of their priorities to stock due to issues of maintaining fresh stock. The perceived financial cost of supplying healthy alternatives while maintaining competitive advantage was also reported as a challenge, in addition to maintaining food freshness which was in-line with the findings of McIsaac (62) and Naylor and colleagues (64). However, businesses did recognise the importance of implementing nutrition-related policies as they understood the influence the centres have on children's nutrition.

A facilitator that was commonly expressed was support from external bodies, such as the government, in implementing healthy eating initiatives and both café users and managers suggested providing educational resources in the café could encourage customers to make healthier choices. These resources might be in the format of posters or table cards of images that highlight a healthier alternative to certain high fat, high salt, high sugar foods. A potential solution that was expressed is to provide support and education to staff achieve the implementation of healthy eating guidelines for the food environment where children socialise.

7 Conclusions

This is the first study of its kind to be carried out on the island of Ireland. The data collected provide new insight into the types of foods available in children's social and activity centres and the perspectives, beliefs, attitudes, barriers to and facilitators of key stakeholders in children's social spaces. As the data are both quantitative and qualitative, they give greater insight than quantitative data alone. The qualitative data provides insight into parents' expressed need for more healthful options to be made available in children's social spaces. The data also highlighted the difficulties that managers encounter with providing healthier options.

Many interventions, as displayed in the literature, target the school or home environment, however children's social spaces are important locations in the life of a growing child which, to-date, have been poorly researched. This study provides actionable evidence on which to develop interventions to modify the food environment within children's social spaces. The findings can contribute to addressing a potential determinant of childhood obesity at an organisational level.

- The review of available literature indicated that there was limited research conducted on food available in children's social spaces; however, the previous studies found that food offerings were generally unhealthy and the majority of food offered consisted of high-fat and high salt foods.
- The findings from the current study indicate the nutritional quality of foods offered in children's social and activity centres varies considerably.
- Vending machines demonstrating the lowest nutritional quality of foods offered and the implementation of 'healthy' vending machines or guidelines for snacks and beverages in vending machines in children's social spaces could make an important contribution to improving the provision of healthful options.
- Community centres demonstrated the healthiest food provision of all centres, although this was not significant. The reason for this difference could be due to the fact that these centres may not be under the same pressures as the commercial centres to increase profits resulting from food purchases or it may be because community centres are under the remit of state agencies and therefore, are likely to be more aware of and may choose to align themselves with recommendations such as healthy eating guidelines.
- The use of the Relative 'Healthfulness Score' can give insight into the relative healthfulness of foods and beverages available in children's social spaces.

- A small number of businesses indicated an awareness of the unique influence social and activity centres such as these have on children's nutrition and had taken steps to implement policies to create more healthful environments.
- Centre managers and catering staff described how consumers have moved towards healthier choices but how they as businesses were more focused on operational activities and physical health than food choice. Both groups reported difficulties in maintained fresh food and identified competition from external business as barriers to healthier food provision; but seen small and easy-to-implement changes, such as oven rather than fried goods, as achievable and desired to improve the healthiness of their offerings when possible and practical.
- Parents reported a general disappointment in healthy food availability in recreational centres and how this often encouraged them to purchase food outside the centre. Parents identified multiple influences that encouraged unhealthy eating and suggested more inventive meal deals, such as picnic baskets, and improved placement of healthier food, to empower healthier choices by children. The use of scenarios also highlighted how compromising with children and complying with social norms to other parents, were important considerations when making food choices. Previous studies indicate that site-specific guidelines can improve the nutritional environment, however guidelines are most effective when their implementation is mandatory rather than voluntary.

8 Recommendations

Food providers have a corporate social responsibility to provide an environment that supports and promotes healthy options for children. These centres are providing an environment where children can be physical active and it's important that this is further supported by healthy food and drink options.

Top ten tips for healthier service provision in social spaces for children

1. Do not display chocolate bars, crisps, sweets, cereal bars at payment/cash desk areas as this increases impulse purchases
2. One hundred per cent of beverages must be sugar free, diet or have no added sugar and tap water should be freely available and low fat and skimmed milk must on offer every day
3. Offer half portions of adult size meals for children
4. Fruit, vegetables or salad should be available at all times
5. Meal deals must include a piece of fruit or a portion of salad
6. Tasty labels – promote healthier options such as 'meal of the day' at the servery or counter
7. Do not display salt, salt substitutes and sugar sachets/cubes
8. Do not provide chips or crisps as an accompaniment to sandwiches
9. At least 50 per cent of all main course options must not be deep fried, batter coated or bread crumb-coated, or include a creamy sauce or pastry
10. All mayonnaise, salad dressings and salad creams (including those used in potato salads and coleslaws) must be low fat, light or reduced calorie versions

Recommendations

1. Publicly funded centres in NI should be made aware of the Nutritional Standards for Health and Social Care, the Nutritional Standards for District Councils and the plans to implement in the future Nutritional Standards for the Public Sector. These standards cover food and drink in catering and retail outlets and vending
2. In ROI, guidance and resources to support in publicly funded venues including centres used by children and their families that offer food and drink should be considered.. Guidance could be adapted from the existing nutrition standards for food and beverage provision for staff and visitors in healthcare settings (https://www.hse.ie/eng/about/who/healthwellbeing/our-priority-programmes/heal/healthy-eating-guidelines/nutrition-standards-for-food-and-beverage-provision-for-staff-and-visitors-in-healthcare-settings.pdf) and from the HSE vending policy (https://www.hse.ie/eng/about/who/healthwellbeing/our-priority-programmes/heal/healthier-vending/)
3. Standards and guidance in NI and ROI should be promoted to privately owned centres

4. Promote the use of the audit tool and scoring system to assess the types of foods and drinks available in centres both for self-auditing by centres and for use by other stakeholders
5. Consider a step-wise approach to making changes e.g. the removal of sugar sweetened beverages from centres. This will help centres to build up confidence in making changes
6. The implementation of standards should coincide with the development and dissemination of support materials and resources specifically for centre managers and staff. An example internationally is the Australian 'Fuel to Go & Play' (https://www.fueltogo.com.au/). Such an approach may include:
    a. An information pack for managers and staff to illustrate the importance of healthy offerings for children in these spaces. It should emphasize the importance of consistent health messages – physical activity and healthy eating go hand in hand. It may contain ideas of how to offer healthier food choices including food swaps, different portion sizes, healthier menu ideas and a template of a healthy eating policy that centres can adapt to implement in their centre
    b. Posters, table cards or hanging cards which centres can use to promote healthier options
    c. Examples of how food and drink can be placed to display or position healthy food options to make them more prominent and appealing including incentives that could encourage families to choose the healthier option e.g. reward cards
    d. An online training programme for centre managers and staff which could be supported by facilitating a network of centre managers to share learning and experience
    e. All supports and materials would need to be piloted and evaluated to demonstrate effectiveness.
7. Parents should be supported to choose and advocate for healthier options. Examples include
    a. Choose centres where there are healthier food and drink options. Ask for freely available water
    b. Ask for healthier options at centres they regularly attend (centre managers and staff clearly reported that they will respond to customer demand)
    c. Talk to other parents about the challenge – the more parents who ask centres for change the more likely it will be that centres will change. Parents need to be supported to recognise their power to bring about change together
    d. Talk to your child about what foods and drinks to choose
    e. Raising awareness of this issue among parents, by organisations such as ***safe***food, to support parents' conversations with their peers, their children and with centres
    f. Messaging for parents should be co-created with parents.

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Appendices

Appendix I: Overview of the audit tools used to describe the food environment.

Nutritional Environment Measures Study **NEMS audit tool**

The literature review found that the Nutritional Environment Measures Study (NEMS) (http://nems-upenn.org/) was widely used in many studies. It has also been used as a basis for other food environment audits (105, 120-124). The NEMS tool demonstrates high inter-rater and high test/ retest reliability; free online training is available for assessors which facilitates its use.

Glanz and colleagues and Saelens and colleagues further developed two types of NEMS audit tools – one for food stores (NEMS-S) (106) and one for restaurants (NEMS-R) (125). For the NEMS study of food stores (NEMS-S), the authors intended to design an audit tool that could be used across different socio-economic areas. NEMS-S was developed based on ten food categories across eighty-five stores and performed well across stores in low- and high-income neighbourhoods. The foods included in the audit were based on foods that contributed most to fat and calories in the American diet and foods recommended by federal health agencies. NEMS-S used these "indicator foods" to assess the healthfulness of food environments within food stores. The audit tool measured the presence of these foods based on availability, quality and price. NEMS-S comprehensively described the audit tool development process which was relevant to our own audit tool design process (106).

NEMS-R was developed based on auditing n = 217 restaurants (125). This audit tool is a useful measure as restaurants can be diverse environments with very variable food provision and can be difficult to categorise and measure. The tool was designed to take account of the environment within restaurants which also meant capturing any messages consumers encounter, encouraging them to choose more healthy or unhealthy dishes. It also measured the availability of a children's menu within restaurants and the availability of healthy or less healthy options within children's menus.

The NEMS-S audit tool provided relevant information on the method of developing a comprehensive audit tool (106). The NEMS-R audit tool modelled how to capture information within an environment which can influence food choice such as healthful or less healthful messages on menus that promote larger portion sizes or healthy menu modifications (125).

Food Environment Audit for Diverse Neighbourhoods (FEAD-N)

Izumi and colleagues developed a novel audit tool to capture nutritional quality of foods offered in neighbourhood food stores (104). This tool set out to measure the social aspects of food store environments which had not been previously measured, such as marketing, store cleanliness, loitering, and security features within a store.

The relevance of this audit tool to our tool development was that it considered the whole food environment within stores, such as social aspects of a store, which was rarely considered in previous research. While many of the physical and social aspects of the food store environment measured in this audit were not relevant to children's food environments, it highlighted the importance of considering broader aspects that influence food choice within children's social spaces that may serve as barriers or facilitators to healthy food choice. Additionally, this audit tool had been tested for inter-rater reliability and performed well during testing (104).

Bridging the Gap audit tool

Rimkus *et al.* (2013) developed the BTG-FSOF (Bridging The Gap – Food Store Observation Form) (105). This tool measured less healthful foods such as sugar-sweetened beverages and snack foods in addition to healthy foods. This audit tool was developed based on a number of previously developed audit tools such as the NEMS-S checklist and contained a number of measures adapted from NEMS-S (105).

This audit tool gave an excellent example of a checklist that was easy and quick to complete and informed the development of the beverage and snack checklist in the audit tool for this study. The BTG-FSOF audit tool had been tested for reliability during development and indicated good agreement on measures of product availability (105).

The researchers at Bridging the Gap also developed an audit tool for fast-food restaurants and this tool informed the development of the kids' menu audit questions within the present research. This audit tool had been used to collect data from 2,176 restaurants across the United States. This tool also informed the measurement of marketing occasions within centre canteens or restaurants. The instrument was previously validated; however, the results of the validation to our knowledge, have not been published.

Adjoian *et al.* (2014)

Adjoian and colleagues developed an audit tool to measure differences in the sugar-sweetened beverage retail environment across NYC neighbourhoods (126). These neighbourhoods had varying self-reported SSB consumption patterns and this study set out to assess if the retail environment could have impact on purchasing behaviour (126). The authors of this study found no validated audit tool appropriate to their research aims existed. The paper described in detail the method of audit development and informed the methodology of developing a bespoke audit tool, particularly in the differentiation between different types of beverages.

Black *et al.* (2014)

The study by Black *et al.* aimed to develop a 'healthfulness' score that could be calculated for individual food retail stores in the UK (127). This measure aimed to assess the healthfulness of the in-store environment, which can influence in-store food choice such as more or less healthy foods (127). The 'healthfulness' score was calculated based on nine different variables such as price, variety, and shelf-placement. Several of these variables were not relevant for the purposes of the present research, nevertheless, the method described in developing the scoring system was relevant.

SNACZ Checklist

The SNACZ checklist was developed to assess the healthfulness of the food store environments for children and the availability of healthier snack and beverage alternatives for children in food stores located near schools in rural areas near Oregon, in the United States (128). The checklist was developed based on common snacks and beverages consumed by children. Whilst the SNACZ checklist of food items listed products commonly found in the US, the types of foods reflected the snacks that children regularly eat and may be available in children's social spaces.

Roy *et al.* (2016)

Roy *et al.* developed an audit tool and scoring system for use in tertiary education institutions in Australia (107). While this study was based within an organisational food environment (universities and technical/ further education colleges), it was still relevant to the development of an audit tool. The scoring system was called the "food-environment quality index". This scoring system was a simple 0/1 scoring system for healthy or less healthy foods. A point was awarded if a less healthy food was not available and no points were awarded if a less healthy food was available. For healthy options, a point was awarded if a food was available and no points were awarded if a food was unavailable (107).

Table 21: Relevant audit tools that informed the development of an appropriate instrument to measure children's social spaces

Study	Country	Setting	Audit tool	Audit design	Food environment scoring system	Reliability of audit
Adjoian *et al.*, 2014	United States	883 food stores in 6 NYC neighbourhoods	Comparing sugary drinks in the Food Retail Environment in 6 NYC neighbourhoods	Cross-sectional audit tool developed to assess availability of 13 sugary drinks & low-calorie options in 883 food stores	Presence of specified SSBs and promotional material	Pre-tested tool in 29 stores and inter-rater reliability assessed
Black *et al.*, 2014	United Kingdom	601 retail food stores in 6 councils in UK	Measuring the healthfulness of food retail stores: Variations by store type and neighbourhood deprivation	Observational cross-sectional audit of food stores	Healthfulness scoring system developed; variety, price, promotion, shelf placement and store placement of 7 healthy and 5 less healthy products; quality of 2 fruit & 4 veg	Inter-rater reliability: all variables except for fruit quality had kappa value ≥ 0.73
Glanz *et al.*, 2007	United States	88 food stores – 24 grocery & 64 convenience	NEMS-S	Food store observation instrument	"Food environment quality" was calculated for each store based on availability, quality and price	High inter-rater reliability and test/ retest reliability for each individual food item
Izumi *et al.*, 2011	United States	167 Food stores	Food Environment Audit of Diverse Neighbourhoods (FEAD-N)	Instrument to assess inter-rater reliability of food store audit	Availability of specified food items	Inter-rater reliability of food items surveyed in stores; high inter-rater reliability; most kappa scores substantial (0.81-100)
Izumi *et al.*, 2015	United States	Food stores near rural schools	SNACZ checklist	Cross-sectional survey of the availability of healthy snacks and beverages in food stores near rural schools	Institute of Medicine Nutrition Standards for food in Schools	Measured availability of snacks and beverages in different portion sizes

Rimkus *et al.*, 2013	United States	120 food stores	Bridging the Gap Food Store Observation Form (BTG-FSOF)	Observational cross-sectional audit of food stores	Availability of specified food items	Testing inter-rater reliability of product availability, pricing and promotions
Roy *et al.*, 2016	Australia	Technical And Further Education (TAFE) institutions	Developing Food Environment Quality-Index	Cross-sectional audit of food outlets	NSW Healthy School Canteen Strategy	Inter-coder reliability tested at 99% agreement
Saelens *et al.*, 2007	United States	217 Restaurants	NEMS-R	Restaurant observation instrument	NEMS scoring system developed	Inter-rater and test/ retest reliability assessed; very good reliability of both measures

Appendix II: Audit instruction manual

Kids' Social Spaces

Audit Instruction Manual

If centres allow photos to be taken of vending machine/s in venue, please also fill out Section I & J and take a photo of the vending machine

If photos are not permitted to be taken, please complete Section I & J

Questions highlighted in red are filter questions i.e. if answered yes to previous question, does....etc.

SECTION A: GENERAL INFORMATION	
Section A	General questions about centre to complete. Count up number of available seats in eating area near café/ restaurant

SECTION B: BOTTLED BEVERAGES AVAILABLE TO PURCHASE IN CAFÉ/ CENTRE SHOP	
Section B (1)	If any 100% fruit juice drinks (with no added sugar) are available, tick yes. Note the brand, variety &size (mls) of drink (e.g. Copella Cloudy apple juice 300mls). Take a photo of the drink label if possible

Section B (2)	If any fruit drinks (fruit juice drink with added sugar) are available, tick yes. Note the brand, variety & size (mls) of drink (e.g. Drench Peach & Mango 500mls). Take a photo of the drink label if possible
Section B (3)	If any smoothies are available, are available, tick yes. Note the brand, variety & size (mls) of drink (e.g. Innocent Seriously Strawberry 250mls) . Take a photo of the drink label if possible
Section B (4)	If any sugar-free fizzy drinks are available, tick yes. Examples include 7up free, Diet Pepsi, Diet Coke, Coke Zero etc.
Section B (5)	If any regular fizzy drinks (sugar-sweetened) are available, tick yes. Examples include Fanta, 7up, Coca-Cola, Dr. Pepper etc.
Section B (6)	If any sports drinks are available, tick yes. Examples include Lucozade, Lucozade Sport etc.
Section B (7)	If any energy drinks are available, tick yes. Examples include Red Bull, Monster, Rockstar etc.
Section B (8)	If any type of pre-packaged plain un-flavoured milk is available, tick yes. For this question, there is no need to distinguish between full-fat or low-fat varieties.
Section B (9)	If any flavoured milks are available, tick yes. Examples include Yazoo, Avonmore Strawberry Milk, Mooju Chocolate milk etc.
Section B (10)	If any protein milks are available, tick yes. Examples include Avonmore Protein milk.
Section B (11)	If any dairy-free milk drinks are available, tick yes. Examples include Alpro soya milk, Innocent Almond milk, Coconut Dream etc.
Section B (12)	If any diluted sugar-free squash drinks are available, tick yes. Examples include Robinsons Fruit Shoot, Mi Wadi, etc.
Section B (13)	If yes to the above question, is the squash drink sugar-free?
Section B (14)	If any plain bottled water is available, tick yes. Plain water shouldn't contain any flavouring, sugar, caffeine or be carbonated.

Section B (15)	If any sparkling water is available, tick yes. For this question, it is not important to distinguish between flavoured sparkling water and plain sparkling water.
Section B (16)	If any flavoured still water is available to purchase, tick yes. For this question, it is not important to distinguish between varieties.

SECTION C: SNACKS AVAILABLE TO PURCHASE IN CAFÉ/ SHOP	
Section C (1)	If any packets of regular crisps are available, tick yes. Examples include Walkers, Tayto, Keoghs (regular crisps); Treble Crunch, Velvet Crunch ("low fat" crisps); Lentil Crisps, Sweet potato crisps ("Healthier" crisps); Meanies, Skips, Cheetos, Tayto Snax ("Lighter" crisps) etc.
Section C (2)	If any packets of popcorn are available, tick yes.
Section C (3)	If any dried fruit + nut/ seed snack packs are available, tick yes. Examples include raisins and peanuts, cranberries and sunflower seeds etc.
Section C (4)	If any Plain or Roasted Nuts are available, tick yes. Examples include Roasted Peanuts, Cashew Nuts, Brazil Nuts etc. Not salted, chocolate-coated or yoghurt-coated.
Section C (5)	If any Cookies are available, tick yes. For this question, it is not important to distinguish between types of cookies.
Section C (6)	If any chocolate bars are available, tick yes. Examples include Mars bars, Dairy Milk chocolate of any type (e.g. Fruit & Nut), Twix, Twirl, Aero, Bounty, Snickers etc.
Section C (7)	If any Protein bars/ meal replacer bars/ flapjacks or cereal bars are available, tick yes. Examples include SlimFast bars, Fulfil bars, Nine bars, Nature Valley bars, Rice Crispie Squares bars, Alpen bars, Tracker bars, any type of breakfast biscuits (e.g. Belvita), Go Ahead bars, Nutri-Grain bars etc.
Section C (8)	If any plain rice cakes are available, tick yes. Rice cakes should not be salted, chocolate-covered or yoghurt-covered.
Section C (9)	If cheese and crackers are available, tick yes.

Section C (10)	If any croissants, muffins, cupcakes, brownies, cake slices, tart slices or scones are available, tick yes.
Section C (11)	If any jelly sweets are available to purchase, tick yes. Examples include The Natural Confectionary Company, Haribo, Fruit Pastilles, Wine Gums, Jelly Babies etc.
Section C (12)	If any yoghurts are available, tick yes. If available, please not the brand of yoghurt.
Section C (13)	If any sausage rolls/ jambons are available, tick yes.
Section C (14)	If any soup is available, tick yes. Examples include vegetable soup, chicken soup etc.
Section C (15)	If any fresh fruit or vegetable slices are available, tick yes. Examples include carrot sticks, cucumber slices, babycorn, mangetout, cherry tomatoes, apple slices, grapes etc.
Section C (16)	If any fresh fruit pieces are available, tick yes. Examples include oranges, bananas, apples, pears etc.

SECTION D: MEALS AVAILABLE TO PURCHASE IN CAFÉ	
Section D (1)	If any pizza is available, tick yes.
Section D (2)	If any sausage rolls/ jambons are available, tick yes.
Section D (3)	If any chicken fillet rolls with/ without curry sauce are available, tick yes.
Section D (4)	If any chips are available as part of a meal, tick yes.
Section D (5)	If any potato wedges are available as part of a meal, tick yes.

Section D (6)	If any burgers are available, tick yes. Examples include chicken burgers, turkey burgers, veggie burgers, beef burgers etc. For this question, it is not important to distinguish between types of burgers.
Section D (7)	If any chicken nuggets or chicken goujons are available as part of a meal, tick yes.
Section D (8)	If any cocktail sausages are available as part of a meal, tick yes.
Section D (9)	If nachos are available as a meal, tick yes. Nachos can include melted cheese, salsa etc.
Section D (10)	If any sandwiches or wraps are available chilled, tick yes.
Section D (11)	If any paninis or sandwiches or wraps that can be heated are available, tick yes.
Section D (12)	If any cheese toasties are available, tick yes.
Section D (13)	If any scrambled eggs with or without toast are available, tick yes.
Section D (14)	If salad is offered as a main course, tick yes. Examples include grilled chicken salad, Caesar salad etc.
Section D (15)	If there is a salad bar or a selection of salads available to choose as part of a side option, tick yes. Examples include tomato salad, bean salad, broccoli salad etc.
Section D (16)	If soup is available as a meal, tick yes.
Section D (17)	If any spaghetti or pasta dishes are available, tick yes. Examples include spaghetti Bolognese etc.
Section D (18)	If chicken curry with rice is available as a meal, tick yes.

Section D (19)	If baked beans are available as part of a meal, tick yes.
Section D (20)	If vegetables are available as part of a meal, tick yes. Examples include sweetcorn, garden peas, cooked carrot, green beans etc.
Section D (21)	If any type of ice-cream is available, tick yes.
Section D (22)	If any type of fruit-base dessert is available, tick yes. Please write down type of dessert in space provided.
Section D (23)	If any cakes or tarts are available, tick yes. Examples include carrot cake, lemon cake, chocolate cake, cheesecake, apple tart.

QUESTIONS FOR VENDING MACHINES ONLY

SECTION E: VENDING MACHINES INFORMATION	
Section E (1)	List how many vending machines present in the centres in areas that are used by children
Section E (2)	Tick yes if there is any branding or advertisements on any vending machines.
Section E (3)	List any advertising or branding on vending machines.
Section E (4)	If any advertising or branding is visible on vending machines, tick if the advertised product is available to purchase in the vending machine.
Section E (5)	Tick yes if there are any messages promoting healthy foods on the vending machine or in a nearby location to the vending machines or on any food packaging in the vending machine?

Section E (6)	List any messages promoting healthy foods around vending machines.
Section E (7)	Tick yes if any of the promoted healthy foods are available in the vending machine.

SECTION F: BOTTLED BEVERAGES AVAILABLE TO PURCHASE IN VENDING MACHINE	
Section F (1)	If any 100% fruit juice drinks (with no added sugar) are available, tick yes. Also note the size (mls) of drink and take a photo of the drink label
Section F (2)	If any fruit drinks (fruit juice drink with added sugar) are available, tick yes. Also note the size (mls) of drink and take a photo of the drink label
Section F (3)	If any smoothies are available, are available, tick yes. Also note the size (mls) of drink and take a photo of the drink label
Section F (4)	If any sugar-free fizzy drinks are available, tick yes. Examples include 7up free, Diet Pepsi, Diet Coke, Coke Zero etc.
Section F (5)	If any regular fizzy drinks (sugar-sweetened) are available, tick yes. Examples include Fanta, 7up, Coca-Cola, Dr. Pepper etc.
Section F (6)	If any sports drinks are available, tick yes. Examples include Lucozade, Lucozade Sport etc.
Section F (7)	If any energy drinks are available, tick yes. Examples include Red Bull, Monster, Rockstar etc.
Section F (8)	If any type of pre-packaged plain un-flavoured milk is available, tick yes. For this question, there is no need to distinguish between full-fat or low-fat varieties.
Section F (9)	If any flavoured milks are available, tick yes. Examples include Yazoo, Avonmore Strawberry Milk, Mooju Chocolate milk etc.
Section F (10)	If any protein milks are available, tick yes. Examples include Avonmore Protein milk.

Section F (11)	If any dairy-free milk drinks are available, tick yes. Examples include Alpro soya milk, Innocent Almond milk, Coconut Dream etc.
Section F (12)	If any diluted sugar-free squash drinks are available, tick yes. Examples include Robinsons Fruit Shoot, Mi Wadi, etc.
Section F (13)	If answered yes to previous question (Q12), tick yes, if squash drink is sugar-free.
Section F (14)	If any plain bottled water is available, tick yes. Plain water shouldn't contain any flavouring, sugar, caffeine or be carbonated.
Section F (15)	If any sparkling water is available, tick yes. For this question, it is not important to distinguish between flavoured sparkling water and plain sparkling water.
Section F (16)	If any flavoured still water is available to purchase, tick yes. For this question, it is not important to distinguish between varieties.

SECTION G: SNACKS AVAILABLE TO PURCHASE IN VENDING MACHINES	
Section G (1)	If any packets of regular crisps are available, tick yes. Examples include Walkers, Tayto, Keoghs (regular crisps); Treble Crunch, Velvet Crunch ("low fat" crisps); Lentil Crisps, Sweet potato crisps ("Healthier" crisps); Meanies, Skips, Cheetos, Tayto Snax ("Lighter" crisps) etc.
Section G (2)	If any packets of popcorn are available, tick yes.
Section G (3)	If any dried fruit + nut/ seed snack packs are available, tick yes. Examples include raisins and peanuts, cranberries and sunflower seeds etc.
Section G (4)	If any Plain or Roasted Nuts are available, tick yes. Examples include Roasted Peanuts, Cashew Nuts, Brazil Nuts etc. Not salted, chocolate-coated or yoghurt-coated.
Section G (5)	If any Cookies are available, tick yes. For this question, it is not important to distinguish between types of cookies.

Section G (6)	If any chocolate bars are available, tick yes. Examples include Mars bars, Dairy Milk chocolate of any type (e.g. Fruit & Nut), Twix, Twirl, Aero, Bounty, Snickers etc.
Section G (7)	If any Protein bars/ meal replacer bars, flapjacks or cereal bars are available, tick yes. Examples include SlimFast bars, Fulfil bars, Nine bars, Nature Valley bars, Rice Crispie Squares bars, Alpen bars, Tracker bars, any type of breakfast biscuits (e.g. Belvita), Go Ahead bars, Nutri-Grain bars etc.
Section G (8)	If any plain rice cakes are available, tick yes. Rice cakes should not be salted, chocolate-covered or yoghurt-covered.
Section G (9)	If cheese and crackers are available, tick yes.
Section G (10)	If any croissants, muffins, cupcakes, brownies, cake slices, tart slices or scones are available, tick yes.
Section G (11)	If any jelly sweets are available to purchase, tick yes. Examples include The Natural Confectionary Company, Haribo, Fruit Pastilles, Wine Gums, Jelly Babies etc.
Section G (12)	If any yoghurts are available, tick yes. If available, please not the brand of yoghurt.
Section G (13)	If any sausage rolls/ jambons are available, tick yes.
Section G (14)	If any fresh fruit or vegetable slices are available, tick yes. Examples include carrot sticks, cucumber slices, babycorn, mangetout, cherry tomatoes, apple slices, grapes etc.
Section G (15)	If any fresh fruit pieces are available, tick yes. Examples include oranges, bananas, apples, pears etc.

QUESTIONS THAT MAY NEED CONSULTATION WITH CENTRE STAFF

SECTION H: KIDS' MEALS AVAILABLE TO PURCHASE IN CAFÉ	
Section H (1)	Tick yes, if kids' meals are available as a separate option on the menu. You may need to ask a member of staff if it is not visible on the menu.
Section H (2)	Tick yes, if half adult portions are an option for children's meals.
Section H (3a)	If kids' meals are an option on the menu, is there an option of plain water or milk as a drink in the meal?
Section H (3b)	If kids' meals are an option on the menu, ask a member of staff if there is an option of plain water or milk as a drink in the meal?
Section H (3c)	If kids' meals are an option on the menu, is there an option of fruit, vegetables, salad or yoghurt as a side option in the meal?
Section H (3d)	If kids' meals are an option on the menu, ask a member of staff if there is an option of fruit, vegetables, salad or yoghurt as a side option in the meal?
Section H (4)	If kids' meals are an option, do kids' meals offer kids' toys as part of their kids' meals promotions?
Section H (5)	If kids' meals are an option, do kids' meals come with food packaging with colourful designs or cartoon characters?
Section H (6)	If kids receive party bags to take home after a party, tick yes.
Section H (7)	If kids receive party bags to take home, tick yes if party bags contain food items such as sweets, lollipops, chocolate bars, cake etc.
Section H (8)	If meals are served with any type of voucher, tick yes

SECTION I: PROMOTIONS & PROMOTIONAL MATERIALS

Section I (1)	If any promotional offers on meals are visible in the vicinity of the eating area, tick yes.
Section I (2)	If the above question was answered yes, record where the type of promotion. **Pre-coded responses**: 2 for 1 meal deals; meal deal (e.g. €5 for chips & drink); Free toy with meal; Charity donation when meal purchased (e.g. 20c of each meal sold goes to charity); Free soft drink with every meal purchased; Free kids' meal with adult meal purchased; Chance to win prize when meal purchased; Other: please list
Section I (3)	If the above question was answered yes, record where the promotion could be seen. **Pre-coded responses**: Leaflets; Tray covers; Menu boards; Posters; digital screens with promotional offers; Promotional material at tables; cardboard cut-outs of cartoon characters, Other: please list
Section I (4)	If any healthy eating promotional materials are visible, tick yes. Examples include posters, flyers, leaflets etc.
Section I (5)	If the above question was answered yes, list where the healthy eating promotional material is visible.

SECTION J: NUTRITIONAL INFORMATION AND POLICIES	
Section J (1)	Tick yes, if a menu is available. Take a photo if possible.
Section J (2)	Tick yes, if a separate kids' menu is available. Take a photo if possible.
Section J (3)	Tick yes, if a separate birthday party menu is available. Take a photo if possible.
Section J (4)	Tick yes, if calorie information of food is clearly visible at till/ on menu boards/ in food counter.
Section J (5)	Tick yes, if ingredients are clearly displayed or if ingredients for all foods can be viewed upon request.

Section J (6)	Tick yes, if salt is added to chips/ wedges etc. before serving.
Section J (7)	Tick yes, if brown bread /wholegrain versions of bread/ wraps for sandwiches are available on request.
Section J (8)	Tick yes, if low-fat spreads are available instead of butter.
Section J (9)	Tick yes, if a water fountain is present in the centre or if water is freely available and if water does not need to be purchased. Ask a member of staff if necessary.
Section J (10)	Tick yes, if sugar or salt sachets or shakers are present on tables.
Section J (11)	Tick yes, if at least one type of fresh fruit/ vegetable is available to purchase in the venue
Section J (12)	Tick yes, if customers are permitted to bring food from home or outside the centre and may use seating area. Ask a member of staff if necessary.
Section J (13)	Tick yes, if facilities are present in the centre so that customers can prepare their own food.
Section J (14)	Ask a member of staff about calorie information of food served. Tick boxes as appropriate as to where the calorie information can be accessed.

Appendix III: Audit tool

Kids' Social Spaces Audit Questionnaire

(*Please ensure all sections are completed*)

Questions highlighted in red are filtered questions.

Audit has been divided into 2 sections – Questions for vending machines only and Questions which may require consultation with centre staff

SECTION A: GENERAL INFORMATION	
Survey date	
Name of venue	
Venue address	
Venue ID code	
How many seats in eating area?	

SECTION B: BOTTLED BEVERAGES AVAILABLE TO PURCHASE IN CAFÉ/ CENTRE SHOP (NOT IN VENDING MACHINE)			

Question: **Are any of the following available to purchase in café/ centre shop? (not in vending machines)**	**No**	**Yes**	**Not applicable**
1) 100% fruit juice (no added sugar) If yes, please list brand, variety & mls (Take photo if possible)	☐	☐	☐
2) Fruit drink with added sugar If yes, please list brand, variety & mls (Take photo if possible)	☐	☐	☐
3) Smoothies If yes, please list brand, variety & mls (Take photo if possible)	☐	☐	☐
4) Diet (sugar-free) fizzy drinks (e.g. Coke Zero, 7up free, Diet Pepsi)	☐	☐	☐
5) Regular (sugar-sweetened) fizzy drinks (e.g. Coca Cola, Fanta, 7up etc.)	☐	☐	☐
6) SPORT DRINKS (e.g. Lucozade, Lucozade Sport, Mountain Dew)	☐	☐	☐
7) ENERGY DRINKS (e.g. Red Bull, Monster etc.)	☐	☐	☐
8) Plain milk	☐	☐	☐
9) Flavoured milk with added sugar (e.g. Chocolate/ strawberry/ vanilla milk)	☐	☐	☐
10) Protein Milk	☐	☐	☐

11) Dairy-free milk drinks (e.g. soya milk; coconut milk; oat milk)	☐	☐	☐
12) Dilutable squash/ cordial (e.g. Mi Wadi/ Robinsons)	☐	☐	☐
13) If yes to Section B Q12, does the squash contain "no added sugar"? (Is it sugar-free?)	☐	☐	☐
14) Plain bottled water (without flavouring, additives, carbonation or caffeine)	☐	☐	☐
15) Sparkling water (with/ without flavouring)	☐	☐	☐
16) Flavoured still water (e.g. Volvic strawberry water)	☐	☐	☐

SECTION C: SNACKS AVAILABLE TO PURCHASE IN CAFÉ/ SHOP (NOT VENDING MACHINE)			
Question: Are any of the following available to purchase (not in vending machines)?	**No**	**Yes**	**Not applicable**
1. Any type of crisps (Please list brand/ variety) (see Audit Protocol document for examples)	☐	☐	☐
2. Popcorn	☐	☐	☐
3. Dried fruit + nut/ seeds snack packs	☐	☐	☐
4. Plain/ roasted nuts	☐	☐	☐

5. Cookies	☐	☐	☐
6. Chocolate bars	☐	☐	☐
7. Protein bars/ meal replacer bars/ flapjacks/ cereal bars	☐	☐	☐
8. Rice cakes (plain)	☐	☐	☐
9. Cheese & crackers	☐	☐	☐
10. Croissants/muffins/cupcakes/brownies/cake/tart slice/scone	☐	☐	☐
11. Jelly sweets (e.g. Haribo)	☐	☐	☐
12. Yoghurt (If yes, please list brand e.g. Muller Corner, Petit Filous)	☐	☐	☐
13. Sausage rolls/Jambons	☐	☐	☐
14. Soup	☐	☐	☐
15. Fruit/ vegetable slices (e.g. apple slices, carrot slices, cucumber slices)	☐	☐	☐

16. Fresh fruit/ vegetables pieces (e.g. Banana, grapes, apple, avocado)	☐	☐	☐

Question: **Are any of the following available?**	**No**	**Yes**	**Not applicable**
1. Pizza	☐	☐	☐
2. Sausage rolls/ Jambons (e.g. Ham & cheese jambons)	☐	☐	☐
3. Chicken fillet rolls with/without curry sauce	☐	☐	☐
4. Chips (French fries)	☐	☐	☐
5. Potato Wedges	☐	☐	☐
6. Burgers	☐	☐	☐
7. Chicken goujons/ chicken nuggets	☐	☐	☐
8. Cocktail sausages	☐	☐	☐
9. Nachos (tortilla crisps with melted cheese and sauce)	☐	☐	☐
10. Sandwiches/ wraps (cold)	☐	☐	☐
11. Paninis (warm)	☐	☐	☐
12. Cheese toastie	☐	☐	☐

13. Scrambled eggs (with/without toast)	☐	☐	☐
14. Salad as a main course (e.g. grilled chicken salad)	☐	☐	☐
15. Salad bar (selection of salads that can be chosen as a side order)	☐	☐	☐
16. Soup	☐	☐	☐
17. Spaghetti/ pasta dishes	☐	☐	☐
18. Chicken curry with rice	☐	☐	☐
19. Baked beans (as a side option)	☐	☐	☐
20. Vegetables (e.g. Garden peas/ Cooked carrot)	☐	☐	☐
21. Ice cream	☐	☐	☐
22. Any fruit-based dessert (more than 50% fruit)? (e.g. fruit salad) **Please write down dessert here.**	☐	☐	☐
23. Cakes/ tarts (e.g. Carrot Cake, Chocolate Cake, Cheese Cake, Apple Tart)	☐	☐	☐

QUESTIONS FOR VENDING MACHINES ONLY

Please fill out following information about vending machines in area used by children in the centre. If photos are permitted to be taken, please take a clear photo of each vending machine in the area used by children in the centre. If photos are permitted to be taken, please also fill out Section F (Bottled Drinks available to purchase in vending machines) and Section G (Snacks available to purchase in vending machines).

SECTION E: VENDING MACHINES INFORMATION

1. How many vending machines are present in the area used by children? ☐

2. Any branding or advertising visible on any vending machines?

No ☐ Yes ☐ Not applicable ☐

3. If yes, please list:

_____
_____
_____

4. Is the advertised product available in vending machine?

No ☐ Yes ☐ Not applicable ☐

5. Are there any messages promoting healthy foods on any vending machines or nearby location or on packaging of food in a vending machine? (Save your smile, drink water etc)

No ☐ Yes ☐ Not applicable ☐

6. If yes, please list:

_____

_____

_____

7. Are any of these promoted foods available in the vending machine?

No ☐ Yes ☐ Not applicable ☐

SECTION F: BOTTLED BEVERAGES AVAILABLE TO PURCHASE IN VENDING MACHINE			
Question: **Are any of the following available to purchase in vending machines?**	**No**	**Yes**	**Not applicable**
1) 100% fruit juice (no added sugar) If yes, please list brand, variety & mls (Take photo if possible)	☐	☐	☐
2) Fruit drink with added sugar If yes, please list brand, variety & mls (Take photo if possible)	☐	☐	☐
3) Smoothies If yes, please list brand, variety & mls (Take photo if possible)	☐	☐	☐

4) Diet (sugar-free) fizzy drinks (e.g. Coke Zero, 7up free, Diet Pepsi)	☐	☐	☐
5) Regular (sugar-sweetened) fizzy drinks (e.g. Coca Cola, Fanta, 7up etc.)	☐	☐	☐
6) SPORT DRINKS (e.g. Lucozade, Lucozade Sport, Mountain Dew)	☐	☐	☐
7) ENERGY DRINKS (e.g. Red Bull, Monster etc.)	☐	☐	☐
8) Plain milk	☐	☐	☐
9) Flavoured milk with added sugar (e.g. Chocolate/ strawberry/ vanilla milk)	☐	☐	☐
10) Protein Milk	☐	☐	☐
11) Dairy-free milk drinks (e.g. soya milk; coconut milk; oat milk)	☐	☐	☐
12) Dilutable squash/ cordial (e.g. Mi Wadi/ Robinsons)	☐	☐	☐
13) If yes to Section B Q12, does the squash contain "no added sugar"? (Is it sugar-free?)	☐	☐	☐
14) Plain bottled water (without flavouring, additives, carbonation or caffeine)	☐	☐	☐
15) Sparkling water (with/ without flavouring)	☐	☐	☐

16) Flavoured still water (e.g. Volvic strawberry water)	☐	☐	☐

SECTION G: SNACKS AVAILABLE TO PURCHASE IN VENDING MACHINE			
Question: **Are any of the following available to purchase in vending machines?**	**No**	**Yes**	**Not applicable**
1. Any type of crisps (Please list brand/ variety) (see Audit Protocol document for examples)	☐	☐	☐
2. Popcorn	☐	☐	☐
3. Dried fruit + nut/ seeds snack packs	☐	☐	☐
4. Plain/ roasted nuts	☐	☐	☐
5. Cookies	☐	☐	☐
6. Chocolate bars	☐	☐	☐
7. Protein bars/ meal replacer bars/ flapjacks/ cereal bars	☐	☐	☐
8. Rice cakes (plain)	☐	☐	☐
9. Cheese & crackers	☐	☐	☐

10. Croissants/muffins/cupcakes/brownies/cake/tart slice/scone	☐	☐	☐
11. Jelly sweets (e.g. Haribo)	☐	☐	☐
12. Yoghurt (If yes, please list brand e.g. Muller Corner, Petit Filous)	☐	☐	☐
13. Sausage rolls/Jambons	☐	☐	☐
14. Fruit/ vegetable slices (e.g. apple slices, carrot slices, cucumber slices)	☐	☐	☐
15. Fresh fruit/ vegetables pieces (e.g. Banana, grapes, apple, avocado)	☐	☐	☐

QUESTIONS THAT MAY REQUIRE CONSULTATION WITH CENTRE STAFF

SECTION H: KIDS' MEALS AVAILABLE TO PURCHASE IN CAFÉ			
	No	**Yes**	**Not applicable**

1. Are half adult portions available as an option for meals for children?	☐	☐	☐
2. Are kids' meals available? (e.g. Happy Meal)	☐	☐	☐
3. IF YES, DO KIDS' MEALS OFFER:			
a. DRINKS: Unflavoured plain milk or water?	☐	☐	☐
b. Available when requested?	☐	☐	☐
c. MEALS: Fruit, vegetables, salad or yoghurt side options available?	☐	☐	☐
d. Available when requested?	☐	☐	☐
DO KIDS' MEALS OFFER:			
4. Kids' toys? (e.g. Transformers, Frozen, Minions, Lego etc.)	☐	☐	☐
5. Food packaging with colourful designs/ cartoon characters?	☐	☐	☐
6. Do kids receive party bags to take home after party?	☐	☐	☐
7. If yes, do party bags contain food items? (e.g. Chocolates, sweets etc)	☐	☐	☐
8. Do meals offer any type of voucher (e.g. free or money off next visit or meal) when purchased?	☐	☐	☐

SECTION I: PROMOTIONS & PROMOTIONAL MATERIALS			
Question: Are the following visible?	**Yes**	**No**	**Not applicable**
1. Promotional offers on meals:	☐	☐	☐
2. If yes, record the promotion here: (e.g. 2 for 1, EuroSaver menu, posters, discount on a return trip when meal purchased)	**Pre-coded responses**: 2 for 1 meal deals; meal deal (e.g. €5 for chips & drink); Free toy with meal; Charity donation when meal purchased (e.g. 20c of each meal sold goes to charity); Free soft drink with every meal purchased; Free kids' meal with adult meal purchased; Chance to win prize when meal purchased; Other: please list		
3. If yes, where are menu promotions visible? (e.g. Tray covers, menu board at tills, promotional material on tables, cardboard characters, posters)	**Pre-coded responses**: Leaflets; Tray covers; Menu boards; Hanging cards; Posters; Promotional material at tables; Other: please list		
4. Are healthy eating promotional materials visible? (e.g. Posters, leaflets, flyers)	☐	☐	☐
5. If yes, where are they visible?	**Pre-coded responses**: Leaflets; Posters; Hanging cards; Other: please list		

SECTION J: NUTRITION INFORMATION AND POLICIES			
	Yes	**No**	**Not applicable**
1. Is a menu available? (Take a photo if possible)	☐	☐	☐
2. Kids' menu available? (Take a photo if possible)	☐	☐	☐
3. Birthday party menu available? (Take a photo if possible)	☐	☐	☐
4. Is calorie information displayed clearly at the point of choice? (i.e. at tills/ food counters/menus)	☐	☐	☐
5. Are ingredients clearly displayed?	☐	☐	☐
6. Is salt added to chips/ wedges etc. before serving?	☐	☐	☐
7. Are brown bread /wholegrain versions of bread/ wraps for sandwiches available on request?	☐	☐	☐
8. If spreads (e.g. butter) are available, are low-fat versions also available?	☐	☐	☐
9. Is free drinking water available to customers at all times?	☐	☐	☐
10. Is sugar/ salt available on eating tables?	☐	☐	☐
11. Is at least one type of fresh fruit/ vegetable is available to purchase in the venue?	☐	☐	☐

12. Are customers permitted to bring food from	☐	☐	☐
13. Are facilities provided for customers to prepare their own food? (e.g. cooking stove/ microwave)	☐	☐	☐

Kids' Social Spaces Audit Questionnaire

14. Ask staff about calorie information and tick as appropriate:

Available on menu board

Available on printed material

No nutritional info available

Available on website

Appendix IV: Audit tool scoring system

QUESTIONNAIRE SCORING SYSTEM

MAXIMUM TOTAL POINTS for shop/ canteen/ vending machine/ food env = 45 points

CENTRE SHOP/ CAFÉ = 17 points

CANTEEN = 11 points

VENDING MACHINE = 17 points

SECTION A: GENERAL INFORMATION	
Survey date	n/a
Name of venue	n/a
Venue address	n/a
Venue ID code	n/a
How many seats in eating area?	n/a

SECTION B: BOTTLED BEVERAGES AVAILABLE TO PURCHASE IN CAFÉ/ CENTRE SHOP (NOT IN VENDING MACHINE)			MAX POINTS AVAILABLE FOR THIS SECTION = 11 POINTS		
Question: Are any of the following available to purchase in café/ centre shop? (not in vending machines)	**No**	**Yes**	**Not applicable**	**Reference**	**Rationale**
1) 100% fruit juice	0	1	0	Min. Catering Standards (2017)	Equal to 1 portion of fruit; if 100% juice
2) Fruit drink with added sugar	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Added sugar is not recommended

3) Smoothies	0	1	0	Min. Catering Standards (2017)	Equal to 1 portion of fruit; if sugar not added
4) Diet (sugar-free) fizzy drinks	0	1	0	Min. Catering Standards (2017)	Sugar-free
5) Regular (sugar-sweetened) fizzy drinks	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Contains added sugar
6) SPORT DRINKS	0	0	0	Healthy Ireland Healthy Eating, food safety and food legislation (2019)	Not suitable for children
7) ENERGY DRINKS (e.g. Red Bull, Monster etc.)	0	0	0	Healthy Ireland Healthy Eating, food safety and food legislation (2019)	Not suitable for children
8) Plain milk	0	1	0	Healthy Ireland Nut. Standards for School Meals (2017)	Recommended drink for children
9) Flavoured milk with added sugar (e.g. Chocolate/ strawberry/ vanilla milk)	0	1	0	Healthy Ireland Nut. Standards for School Meals (2017)	Made with milk, which is a recommended drink for children

10) Protein Milk	0	1	0	Healthy Ireland Nut. Standards for School Meals (2017)	Recommended drink for children
11) Dairy-free milk drinks	0	1	0	Min. Catering Standards (2017)	Included in description of "Dairy and alternatives"
12) Dilutable squash/cordial	0	0	0	Healthy Ireland Healthy Eating, food safety and food legislation (2019)	Don't know if it's sugar-free
13) If yes to Section B Q12, does the squash contain "no added sugar"?	0	1	0	Min. Catering Standards (2017)	Sugar-free option
14) Plain bottled water	0	1	0	Healthy Ireland Healthy Eating, food safety and food legislation (2019)	Recommended drink for children
15) Sparkling water	0	1	0	Healthy Ireland Healthy Eating, food safety and food legislation (2019)	Not plain water but no added sugar
16) Flavoured still water	0	1	0	Healthy Ireland Healthy Eating, food safety and	Not plain water but most brands are sugar-free

				food legislation (2019)	

SECTION C: SNACKS AVAILABLE TO PURCHASE IN CAFÉ/ SHOP (NOT VENDING MACHINE) **MAX POINTS AVAILABLE FOR THIS SECTION = 6 POINTS**					
Question: Are any of the following available to purchase (not in vending machines)?	**No**	**Yes**	**Not applicable**	**Reference**	**Rationale**
1. Any type of crisps	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Not recommended snack
2. Popcorn	0	1	0	Healthy Ireland Healthy Eating, food safety and food legislation (2019)	Recommended to limit snacks; but high-fibre, low-fat
3. Dried fruit + nut/ seeds snack packs	0	1	0	Min. Catering Standards (2017)	Contains protein and fruit portion
4. Plain/ roasted nuts	0	1	0	Healthy Ireland Healthy Eating, food	Contains protein source

				safety and food legislation (2019)	
5. Cookies	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Not a recommended snack
6. Chocolate bars	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Not a recommended snack
7. Protein bars/ meal replacer bars/flapjacks/ cereal bars	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Not a recommended snack
8. Rice cakes (plain)	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Easily mixed up with chocolate rice cakes which are not recommended as a snack
9. Cheese & crackers	0	1	0	Food and Nutrition Guidelines	Recommended snack

				for Pre-School Services (2004)	
10.Croissants/muffins/cupcakes/ brownies/cake/tart slice/scone	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Not a recommended snack
11. Jelly sweets	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Not a recommended snack
12. Yoghurt (If yes, please list brand e.g. Muller Corner, Petit Filous)	0	If < 11g sugar/ 100g or <3g fat/ 100g = 1 point	0	Min. Catering Standards (2017)	Recommended source of calcium
13. Sausage rolls/Jambons	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Not recommended for school meals
14. Soup	0	Included in meals	0	Healthy Ireland Nut.	Recommended as vegetable

		section; if available in centre = 1 point in Meals section		Standards for School Meals (2017)	source (although may not be homemade)
15. Fruit/ vegetable slices	0	If fruit/ veg slices/ pieces available = 1 points	0	Healthy Ireland Nut. Standards for School Meals (2017)	Recommended snack
16. Fresh fruit/ vegetables pieces	0		0	Healthy Ireland Nut. Standards for School Meals (2017)	Recommended snack

SECTION D: MEALS (or components of meals) AVAILABLE TO PURCHASE IN CAFÉ **MAX POINTS AVAILABLE FOR THIS SECTION = 11 POINTS**					
Question: Are any of the following available?	**No**	**Yes**	**Not applicable**	**Reference**	**Rationale**
1. Pizza	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Unless home-made but will asume that it is not home-made
2. Sausage rolls/ Jambons (e.g. Ham & cheese jambons)	0	0	0	Healthy Ireland Nut. Standards	Not recommended to

				for School Meals (2017)	be served in school meals
3. Chicken fillet rolls with/without curry sauce	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Limited serving in School Meals as breaded chicken
4. Chips (French fries)	0	0	0	Min. Catering Standards (2017)	Not recommended for everyday
5. Potato Wedges	0	0	0	Min. Catering Standards (2017)	Not recommended for everyday
6. Burgers	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Limited serving in School Meals as processed meat
7. Chicken goujons/ chicken nuggets	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Limited serving in School Meals as breaded chicken
8. Cocktail sausages	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Limited serving in School Meals as breaded chicken
9. Nachos (tortilla crisps with melted cheese and sauce)	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Not recommended as based on crisps

10. Sandwiches/ wraps (cold)	0	1	0	Healthy Ireland Nut. Standards for School Meals (2017)	Recommended lunch option for School Meals
11. Paninis (warm)	0	1	0	***safe*food** "How much bread is in your sandwich?"	Equivalent to 3.5 slices of bread
12. Cheese toastie	0	1	0	Healthy Ireland Nut. Standards for School Meals (2017)	A portion of carbohydrates and protein
13. Scrambled eggs (with/without toast)	0	1	0	Healthy Ireland Nut. Standards for School Meals (2017)	A portion of protein
14. Salad as a main course	0	If either available = 1 point	0	Healthy Ireland Nut. Standards for School Meals (2017)	A portion of veg
15. Salad bar					
16. Soup	0	1	0	Healthy Ireland Nut. Standards for School Meals (2017)	A portion of veg
17. Spaghetti/ pasta dishes	0	1	0	Healthy Ireland Nut. Standards for School Meals (2017)	A portion of meat & carbohydrates
18. Chicken curry with rice	0	1	0	Healthy Ireland Nut. Standards	A portion of meat & carbohydrates

				for School Meals (2017)	
19. Baked beans (as a side option)	0	1	0	Healthy Ireland Nut. Standards for School Meals (2017)	A portion of veg
20. Vegetables	0	1	0	Healthy Ireland Nut. Standards for School Meals (2017)	A portion of veg
21. Ice cream	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Not recommended everyday
22. Any fruit-based dessert (more than 50% fruit)? (e.g. fruit salad)	0	1	0	HSE Min. Catering Standards (2017)	A portion of fruit
23. Cakes/ tarts	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Not recommended everyday

QUESTIONS FOR VENDING MACHINES ONLY

Please fill out following information about vending machines in area used by children in the centre. If photos are permitted to be taken, please take a clear photo of each vending machine in the area used by children in the centre. If photos are permitted to be taken, Section F (Bottled Drinks available to purchase

in vending machines) and Section G (Snacks available to purchase in vending machines) do not need to be completed.

If photos are not permitted to be taken, please fill out Section F (Bottled Drinks available to purchase in vending machines) and Section G (Snacks available to purchase in vending machines)

SECTION E: VENDING MACHINES INFORMATION

8. How many vending machines are present in the area used by children? ☐

9. Any branding or advertising visible on any vending machines?

No ☐ Yes ☐ Not applicable ☐

10. If yes, please list:

_____
_____
_____

11. Is the advertised product available in vending machine?

No ☐ Yes ☐ Not applicable ☐

12. Are there any messages promoting healthy foods on any vending machines or nearby location or on packaging of food in a vending machine? (Save your smile, drink water etc)

The nutritional quality of food available in children's social and activity centres

No ☐ Yes ☐ Not applicable ☐

13. If yes, please list:

_____
_____
_____

14. Are any of these promoted foods available in the vending machine?

No ☐ Yes ☐ Not applicable ☐

SECTION F: BOTTLED BEVERAGES AVAILABLE TO PURCHASE IN VENDING MACHINE			**MAX POINTS AVAILABLE FOR THIS SECTION = 11 POINTS**		
Question: Are any of the following available to purchase in café/ centre shop? (not in vending machines)	**No**	**Yes**	**Not applicable**	**Reference**	**Rationale**
1) 100% fruit juice	0	1	0	Min. Catering Standards (2017)	Equal to 1 portion of fruit; if 100% juice
2) Fruit drink with added sugar	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Added sugar is not recommended

3) Smoothies	0	1	0	Min. Catering Standards (2017)	Equal to 1 portion of fruit; if sugar not added
4) Diet (sugar-free) fizzy drinks	0	1	0	Min. Catering Standards (2017)	Sugar-free
5) Regular (sugar-sweetened) fizzy drinks	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Contains added sugar
6) SPORT DRINKS	0	0	0	Healthy Ireland Healthy Eating, food safety and food legislation (2019)	Not suitable for children
7) ENERGY DRINKS (e.g. Red Bull, Monster etc.)	0	0	0	Healthy Ireland Healthy Eating, food safety and food legislation (2019)	Not suitable for children
8) Plain milk	0	1	0	Healthy Ireland Nut. Standards for School Meals (2017)	Recommended drink for children
9) Flavoured milk with added sugar (e.g. Chocolate/ strawberry/ vanilla milk)	0	1	0	Healthy Ireland Nut. Standards for School Meals (2017)	Made with milk which is a recommended drink for chidren

10) Protein Milk	0	1	0	Healthy Ireland Nut. Standards for School Meals (2017)	Recommended drink for children
11) Dairy-free milk drinks	0	1	0	Min. Catering Standards (2017)	Included in description of "Dairy and alternatives"
12) Dilutable squash/cordial	0	0	0	Healthy Ireland Healthy Eating, food safety and food legislation (2019)	Don't know if it's sugar-free
13) If yes to Section B Q12, does the squash contain "no added sugar"?	0	1	0	Min. Catering Standards (2017)	Sugar-free option
14) Plain bottled water	0	1	0	Healthy Ireland Healthy Eating, food safety and food legislation (2019)	Recommended drink for children
15) Sparkling water	0	1	0	Healthy Ireland Healthy Eating, food safety and food legislation (2019)	Not plain water but no added sugar
16) Flavoured still water	0	1	0	Healthy Ireland Healthy Eating, food safety and	Not plain water but most brands available are sugar-free

				food legislation (2019)	

SECTION G: SNACKS AVAILABLE TO PURCHASE IN VENDING MACHINE **MAX POINTS AVAILABLE FOR THIS SECTION = 6 POINTS**					
Question: Are any of the following available to purchase (not in vending machines)?	**No**	**Yes**	**Not applicable**	**Reference**	**Rationale**
1. Any type of crisps	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Not recommended snack
2. Popcorn	0	1	0	Healthy Ireland Healthy Eating, food safety and food legislation (2019)	Recommended to limit snacks
3. Dried fruit + nut/ seeds snack packs	0	1	0	Min. Catering Standards (2017)	Contains protein and fruit portion
4. Plain/ roasted nuts	0	1	0	Healthy Ireland Healthy	Contains protein source

				Eating, food safety and food legislation (2019)	
5. Cookies	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Not a recommended snack
6. Chocolate bars	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Not a recommended snack
7. Protein bars/ meal replacer bars/flapjacks/ cereal bars	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Not a recommended snack
8. Rice cakes (plain)	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Easily mixed up with chocolate rice cakes which are not recommended as a snack

9. Cheese & crackers	0	1	0	Food and Nutrition Guidelines for Pre-School Services (2004)	Recommended snack
10.Croissants/muffins/cupcakes/ brownies/cake/tart slice/scone	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Not a recommended snack
11. Jelly sweets	0	0	0	Healthy Ireland Nut. Standards for School Meals (2017)	Not a recommended snack
12. Yoghurt (If yes, please list brand e.g. Muller Corner, Petit Filous)	0	If < 11g sugar/ 100g or 1 point <3g fat/ 100g = 1 point	0	Min. Catering Standards (2017)	Recommended source of calcium
13. Sausage rolls/Jambons	0	0	0	Healthy Ireland Nut. Standards for School	Not recommended for school meals

				Meals (2017)	
14. Soup	0	Included in meals section; if available = 1 point in Meals section	0	Healthy Ireland Nut. Standards for School Meals (2017)	Recommended as vegetable source (although may not be homemade)
15. Fruit/ vegetable slices	0	If fruit/ veg slices/ pieces available = 1 points	0	Healthy Ireland Nut. Standards for School Meals (2017)	Recommended snack
16. Fresh fruit/ vegetables pieces	0		0	Healthy Ireland Nut. Standards for School Meals (2017)	Recommended snack

FOOD ENVIRONMENT INFORMATION

SECTION H: KIDS' MEALS AVAILABLE TO PURCHASE IN CAFÉ					
	No	**Yes**	**Not applicable**	**Reference**	**Rationale**
1. Are half adult portions available as an option for meals for children?					
2. Are kids' meals available? (e.g. Happy Meal)					
3. IF YES, DO KIDS' MEALS OFFER:					
a. DRINKS: Unflavoured plain milk or water?					
b. Available when requested?					
c. MEALS: Fruit, vegetables, salad or yoghurt side options available?					
d. Available when requested?					
DO KIDS' MEALS OFFER:					
4. Kids' toys?					

5. Food packaging with colourful designs/ cartoon characters?					
6. Do kids receive party bags to take home after party?					
7. If yes, do party bags contain food items?					
8. Do meals offer any type of voucher (e.g. free or money off next visit or meal) when purchased?					

SECTION I: PROMOTIONS & PROMOTIONAL MATERIALS			
Question: Are the following visible?	**Yes**	**No**	**Not applicable**
1. Promotional offers on meals:	☐	☐	☐
2. If yes, record the promotion here: (e.g. 2 for 1, EuroSaver menu, posters, discount on a return trip when meal purchased)	**Pre-coded responses**: 2 for 1 meal deals; meal deal (e.g. €5 for chips & drink); Free toy with meal; Charity donation when meal purchased (e.g. 20c of each meal sold goes to charity); Free soft drink with every meal purchased; Free kids' meal with adult meal purchased; Chance to win prize when meal purchased; Other: please list		
3. If yes, where are menu promotions visible? (e.g. Tray covers, menu board at tills, promotional material on tables, cardboard characters, posters)	**Pre-coded responses**: Leaflets; Tray covers; Menu boards; Hanging cards; Posters; Promotional material at tables; Other: please list		
4. Are healthy eating promotional materials visible? (e.g. Posters, leaflets, flyers)	☐	☐	☐
5. If yes, where are they visible?	**Pre-coded responses**: Leaflets; Posters; Hanging cards; Other: please list		

SECTION J: NUTRITION INFORMATION AND POLICIES				
	Yes	**No**	**Not applicable**	**Reference**
1. Is a menu available?				

2. Kids' menu available?				
3. Birthday party menu available?				
4. Is calorie information displayed clearly at the point of choice?				
5. Are ingredients clearly displayed?				
6. Is salt added to chips/ wedges etc. before serving?				
7. Are brown bread /wholegrain versions of bread/ wraps for sandwiches available on request?				
8. If spreads (e.g. butter) are available, are low-fat versions also available?				
9. Is free drinking water available to customers at all times?				
10. Is sugar/ salt available on eating tables?				
11. Is at least one type of fresh fruit/ vegetable is available to purchase in the venue?				
12. Are customers permitted to bring food from outside and use seating within the centre?				

13. Are facilities provided for customers to prepare their own food?				
14. Ask staff about calorie information and tick as appropriate:				
Available on menu board			Available on printed material	
Available on website			No nutritional info available	

Appendix V: Case study interviews topic guide

Kids' Social Spaces Project

Case study interviews

Catering Manager

Thank you for taking the time to speak with us today, we really appreciate it. I just want to say that we are not an inspection or anything to do with the safety elements of the centre. All the data is anonymised. The consent form you have signed will be kept separate from the interview transcript. You are not identifiable from any of the information, which may be published in the future. So to begin, can you tell me about....

Icebreakers:

- Who decides the type of food and drink to offer in your centre?
    - What are your best sellers?
- How do you decide about this?
    - Prompt: Is it just you (or other) or is it a group decision?

- What is your input in;
    - Creating the menu?
        - Recipes, variety, etc.
    - Creating the display?
    - Promotions/price?
    - Portion size?
    - What guides you or who helps you? Any influences?
- How much training does your staff have?
    - What does it cover
        - Hygiene
        - Allergies
        - Food safety etc
- What do you think people want in terms of food and drinks offered in your centre?
    - Why do you think that?
    - Is it something that you see or something that people tell you or something that you assume?
        - Prompts: Sale receipts, experience, feedback.
- How much do you consider consumer demand?
- Are there different choices at certain events (such as parties)?

The nutritional quality of food available in children's social and activity centres

****

- Why do you think that your "play centre (or other)" is important for children?
- How is health considered in your centre?
    - Prompt: What types of things are health and how do you promote this~?
- Do you consider the healthiness of your food as part of healthy living?
- How is health considered in your menu?

****

Has there been any menu changes in the last year?

Can you give an example of introducing something new and how it was received?

- Have you introduced any healthy options?
    - And were they successful (and why)?

Finally, from your experience, have you any suggestions how a centre like this can encourage healthier selections/options?

- What would make it difficult to bring this in?
    - Prompts: Suppliers, costs, facilities.

On a scale of 1-10, how healthy is the food is your menu (1-10)?

Thank you for taking the time to participate in the interview.

Catering Staff

Thank you for taking the time to speak with us today, we really appreciate it. I just want to say that we are not an inspection or anything to do with the safety elements of the centre. All data is anonymised. The consent form you have signed will be kept separate from the interview transcript. You are not identifiable from any of the information, which may be published in the future. So to begin, can you tell me about....

Icebreakers:

- Who decides the type of food and drink to offer in your centre?
- How do you decide about this?
    - Prompt: Is it just you (or other) or is it a group decision?

What is your input in;

- (if they are involved in menu creation) creating the menu?
    - Recipes, variety, etc
- Creating the display?
- Promotions/price?
- Portion size?
- Anything else?
- What guides you or who helps you? Any influences?

What do you think clients want in terms of food and drinks offered in your centre?

- Why do you think that?
- Is it something that you see or something that your clients tell you or something that you assume?
    - Prompts: Sale receipts, experience, feedback

Are there different choices at certain events (such as parties)?

****

- Why do you think that your "play centre" is important for children?
- How is health considered in your centre?
- Do you consider the healthiness of your food as part of healthy living?
- How is health considered in your menu?

****

- Has there been any menu changes in the last year?
- Can you give an example of introducing something new and how it was received?
    - Have you introduced any healthy options?
        - And were they successful or not (and why)?
- From your experience, have you any suggestions how a centre like this can encourage healthier selections/options?
    - What would make it difficult to bring this in?
        - Prompts: Suppliers, costs, facilities.
    - On a scale of 1-10, how healthy is the food is your menu (1-10)?

What kind of training in nutrition have you completed for this job?

- Is it something else you would value or find beneficial?
- What would you like included in the training
    - Portion size, cooking skills, general nutrition?

Thank you for taking the time to participate in the interview.

Parents

Thank you for taking the time to meet us today, we really appreciate it. Everything you say is anonymised. The consent form you have signed will be kept separate from the interview transcript. You are not identifiable from any of the information, which may be published in the future. So to begin, can you tell me about....

Icebreakers:

- How often do you attend these establishments? And what type (play centres, sports etc.) do you attend?
- What is the usual reason that you come to this centre?
    - Do you plan this in advance? (is it a regular thing)
- What activities does your child do here?
- **********
- Do you think about food before you make the trip?
- What do you think about the food offered at these centres for children?
    - How often do you buy food here?
    - Price?
    - Do you use the vending machines or the canteen (if appropriate)?
    - What sort of food?

- The last time you were here, can you walk me through what happened, what you bought and why?
    - Why did you decide to buy _____?
- When buying the food, who makes the choice, you or the child?
    - What influences your or your child's choice (e.g. marketing, promotion, cost, portion size, taste)?
- How important is what your child eats at the centre?
    - Is it more important that the child eats (something) or what the child eats?
- What is the healthiest meal that your child likes to eat?
    - (push for a meal, rather than an apple etc)
- Is there anything you do to enable you and your child to eat more healthily in the centre (e.g. bring healthy snacks and drinks from home)?
    - How do you do that?
        - What do you do if the centre doesn't allow you to consume food from outside?
- In your experience, what stops healthy eating in the centre?
        - Prompts: Price? // Variety of choices? // Childs attitudes?
    - How do you think these (barriers) could be improved/ overcome?
- Is nutrition information highlighted anywhere?
        - Would you like that?

- Do you have any suggestions of how to help children and families to eat more healthily in centres like these?
- Finally, how often do you buy something for yourself in these places?
    - Prompt: Like a coffee and treat?

Thank you for taking the time to participate in the focus group/interview.

Appendix VI: Focus group discussions topic guide

Kids' Social Spaces Project

Introduction

Thank you for taking the time to meet with us today, we really appreciate it. We are here today to talk about social centres for children, places like indoor play areas and leisure centres, where you can buy food.

How the focus group works

We will record today's session using audio-recorders. Everything you say today will be anonymised. This means that after the focus group, when we transcribe the audio-recording, instead of using your real name in the transcription, we'll use a name like "Participant 1". You will not be identifiable from any of the information, which may be published in the future. The consent form you have signed will be kept separate from the transcript.

Rules and confidentiality

1. The focus group will run for approximately 1.5 hours.
2. There are no right or wrong answers; we just want to hear what your thoughts and opinions.
3. This is an informal discussion and so feel free to interact, if there's something you agree with or if you disagree. There are no wrong or right answers and feel free to speak up if there's something you disagree with. It's valuable for us to hear different points of view.
4. The recorders can't pick up recordings when 2 people speak at the same time, so we'll try to have one person speaking at a time
5. We may need to move the discussion along to keep with our time for this evening so it might seem like I am cutting you off, but please don't feel offended as this is to make sure we cover all the questions during this time allotted.
6. Confidentiality between participants: Anything that is shared in the room will be kept within this room

So just to help the transcribers, can everyone please say their name and the age of their children.

Icebreakers:

- How often do you attend these centres?
    - And what type (play centres, sports etc.) do you attend?
- What is the usual reason that you go to these centres?
    - Do you plan this in advance? (is it a regular thing?)
    - Do you go weekends or during the week?
- What activities does your child do here?
    - How hungry are the children usually before the activities?

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The nutritional quality of food available in children's social and activity centres

- What type of food do you usually buy at these centres?
- Why do you buy food at these centres?
    - No time for food before?
    - Children are hungry after the activity?
    - A weekly treat or is the visit to the centre enough?
- What do you think about the food offered at these centres for children?
    - How often do you buy food here?
    - Do the options available meet your needs?
        - Choice, would you like more options, hot/cold, type of food, portion
    - Do you use the vending machines or the canteen (if appropriate)?
- How important is what your child eats at the centre?
    - Is it more important that the child eats or drinks (something) or what the child eats?

**********SCENARIOS**********

- Do you have any suggestions of how to improve in the centre to help children and families to eat more healthily?
- What would help you to make healthy food choices at this centre?
    - Such as reward cards, meal deals etc?
- What makes it difficult (to make healthy food choices at this centre)?
    - Such as the smell of chips, peer pressure, etc?
- After all of these ideas, how important do you think healthy options in these types of centres?

Thank you for taking the time to participate in the focus group.

Footnotes to try to get out without asking explicitly: Is the food children eat at the centre similar to the food they eat at home?

Appendix VI: Focus group vignettes

For this section, we are going to talk through some scenarios/stories and then we are going to ask some questions about what happens next.

Scenario 1:

Connor and Brian are two 7-year-old boys. They attend the same 6-week Saturday swimming lesson at the local leisure centre. Last Saturday, after the lesson, they re-joined their parents at the café at the centre. Connor's mother took out an apple and a home-made brown-bread sandwich for him. Brian, instead, got some cash from his parents and rushed to the food counter. A few minutes later, Brian returned to the table with a bag of chips in his hand. Connor stopped eating his sandwich and looked at his mother, can I have a bag of chips?"

Questions:

What do you think happens next? Please consider Connor's mother as a woman in your community, and imagine what she would be thinking and doing at that time.

What if Brian came back with an ice-cream, crisps or a bar of chocolate instead. Would that make any difference (more a treat than food)?

Would it make a difference if the lessons were on a weekday after school or the weekend?

Scenario 2:

Rosa, a full-time homemaker brought her two young kids (4 and 6-years-old) to Busy Bee indoor playground. After half of their 2 hours of crazy playing and screaming, her kids got thirsty, hungry and were pestering her for some foods and drink. Rosa had a packet of biscuits and a bottle of water in her bag. However, on the table there was a notice in big font "only foods and drinks purchased here can be consumed". Rosa went to the food counter, scanning the options. There were kid's meals with vegetables in them, however, they were not cheap. There was water for sale; however, the price of water was higher than Coke.

Questions:

What would you do?

If they were offering a normal option (such as nuggets and chips) that was cheaper; what would you do?

If the options were the same price, what would you do (does/why your opinion change)?

Scenario 3:

Tom and his daughter (Ella) are on a trip to a playcentre complex during the midterm break (October or February). After some activities, it is lunchtime. They have a choice of three hot food outlets: the

burger joint, the hot food vegetarian restaurant and a kids-style mini restaurant (small healthy options: like soup, mini options and small pasta bowls). All options are similar prices (£5/€6). Which place do you think:

Questions:

- Which restaurant will Tom want to bring his daughter?
- Which restaurant would Ella choose?
- If one option was more expensive (2 pound/euro more), would that effect Tom's decision?
    - If Ella really wanted the burger joint, would that effect Tom's choice?

We have now looked at three scenarios. Can you tell me about a time you have experienced this type of problem?

Now in hindsight, what would you have done differently to solve this problem?